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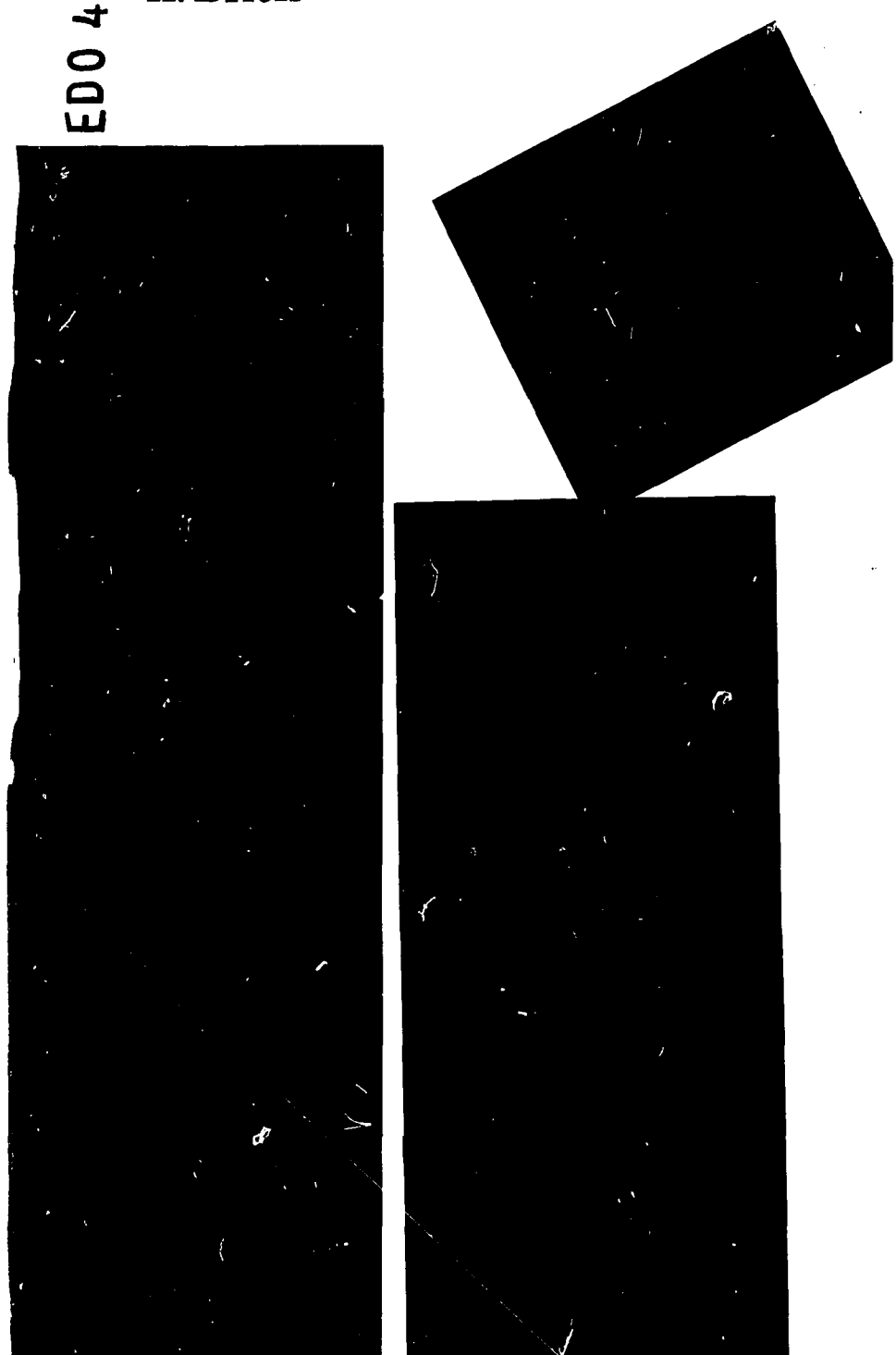
ABSTRACT

The second volume of the Commission on Tests' report contains the briefs submitted by individual members for the consideration of the full Commission. These briefs, which argued for 46 proposed recommendations, formed the basis for the recommendations made in the first volume. Each brief is accompanied by a record of the endorsements, comments, reservations, and dissents concerning the proposals made. Titles are as follows: Possible Directions in Which College Board Tests of Abilities and Learning Capacities Might Be Developed; Redundant Testing; The Principle of Symmetry in College Choice; Can Testing Contribute to the Quest for Community among Students?; Toward a Qualitative Approach to Assessment; A College Entrance Service; Educational Civil Rights and the College Board; A Proposal for a Universal System of Testing for Job Entry; A Program for Providing Information about Colleges to Applicants; Education and Testing in a Period of Qualitative Change; Regional Centers for Guidance in Continuing Education; Diversification in Educational Assessment; A Proposal for Self-Scored, Self-Administered Tests; Can a Machine Admit an Applicant to Continuing Education? See also ED 039 396 and TM 000 269. (CK)

Report of the Commission on Tests

II. Briefs



At their meeting on September 24, 1970, the Trustees of the College Entrance Examination Board received the final report of the Commission on Tests and authorized its publication and distribution to the member institutions and to the public at large. To encourage the fullest consideration and discussion of the report within Board councils, the Trustees also asked their Committee on Planning and Development to review the entire document and make such recommendations as may be appropriate.

Report of the Commission on Tests

II. Briefs

Commission on Tests

College Entrance Examination Board, New York, 1970

Publications of the Commission on Tests

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Contents

Preface

This volume contains the primary source documents for *Report of the Commission on Tests: I. Righting the Balance*;[1] taken together these two volumes are the report of the Commission on Tests to the College Entrance Examination Board. The preface to *Righting the Balance* gives an accounting of the Commission's procedures since 1967 when its members were appointed by the Board for a three-year tenure and charged with undertaking a thorough and critical review of the College Board's testing functions in American education, with considering possibilities for fundamental changes in the present College Board tests and their use, and with making recommendations based on their conclusions.

The first chapter of *Righting the Balance* recounts briefly the history and development of the College Board and its services so that readers can understand the context in which the Commission's work is received. The remainder of that volume explains the consensus that emerged around or is implicit in the materials that have been prepared by individual members of the Commission and are contained in this volume of the Commission's report. Thus while *Righting the Balance* is largely self-contained, the volume in hand can best be read in conjunction with it.

Midway in the Commission's tenure individual members of the Commission were invited by its editorial committee to submit "briefs" to the full Commission for its consideration. These briefs were to be short papers arguing for recommendations addressed to issues that the Commission had previously confronted or to other issues of the members' own choosing. The response to this request was gratifying; within a year or so the Commission had received from 12 members 14 briefs which argued for some 46 proposed recommendations (they are listed on pages 187–194).

1. *Righting the Balance* may be obtained from College Entrance Examination Board, Publications Order Office, Box 592, Princeton, New Jersey 08540. $2 per copy.

These briefs, which are collected here in their final form, were discussed in meetings of the full Commission and subsequently revised as far as their authors chose to revise them in order to gain increased support for their proposed recommendations. After discussion and revision were complete, members of the Commission were invited to "vote" on their fellow members' proposed recommendations by having their names listed as "endorsing," "not endorsing," or "abstaining" in addenda that accompany the briefs. These addenda also contain whatever comment, reservation, or dissent members submitted to accompany their "votes."

Most of these individually proposed recommendations received at least qualified endorsement from most members of the Commission. In the end, however, the individual members, acting as a commission, decided to forward these individually proposed recommendations to the College Board as "suggestions" for the Board's consideration. The status of "recommendation" was reserved for a single general proposition, presented in *Righting the Balance:* that the College Board adopt the full range of potential entrants into programs of postsecondary education as a clientele that is as valued as the Board's institutional clientele and thus is due as large a share of service.

That recommendation and other conclusions of the Commission that are at least implicit in the materials in this volume are supported in *Righting the Balance*. Among those conclusions is a conviction that the College Board should continue, rather than abandon, its testing functions in American education, and that the Board's testing programs and associated services could and should serve three broad functions in the interests of both students and institutions:

— a "distributive" function by contributing to comprehensive and sensitive descriptions of students, of colleges and their programs, and of the potential relationships between the two as both students and colleges engage in a process of reciprocal choice;

— a "credentialing" function by certifying demonstrable educational attainment whether acquired by attendance in school or college or not;

— an "educative" function by instructing students both in subject-matter areas and in the skills and methods of making decisions and choosing.

The Commission recommended that in seeking to serve these functions the College Board should be as responsive to the interests of students as it is to the interests of institutions. This volume of the Commission's report contains its suggestions—generated by its members—about the implications, in a system of mass postsecondary education, of the Board's acting for both its traditional institutional clientele and an equally valued student clientele.

The Commission's suggestions—its members' individual proposals—vary in their nature and are not equally acceptable to all its members. Some urge developments or adjustments in the Board's current tests and associated services. Others foresee entirely new tests or services, and still others propose changes in the way in which the Board is governed or its testing programs organized, in order to provide a more facilitative context for balanced service to the College Board's multiplicity of clienteles. These proposals also vary enormously in the scale of resources, in the preliminary amount of research and development, and in the time required to implement them. No attempt has been made to rank them in terms of priority since they have varying degrees of endorsement and since ranking them would involve judgments about administrative, managerial, and technical matters that the Commission does not feel competent to make.

Some readers will no doubt see implications other than those expressed here of the Board's trying, in the public interest, to serve the "distributive," "credentialing," and "educative" functions equally in the interests of students and institutions. The Commission hopes that all concerned will advance their own

suggestions for consideration, and that the College Board will move swiftly to implement whatever the optimum combination of all such suggestions seems to be in light of the Board's resources.

Possible Directions in Which College Board Tests of Abilities and Learning Capacities Might Be Developed

John B. Carroll

The Issue

Should the College Board's Scholastic Aptitude Test (SAT) be continued in its present form? If not, what steps should be taken toward the development of a more desirable and acceptable form of test?

Discussion

Assumptions:

1. There is, and will continue to be, a symmetric[1] relation between the student seeking access to higher education and the institutions seeking students able to profit from their educational programs. On the one hand, the student has the right to demonstrate his potentialities for profiting from such programs, and on the other hand the institution has the right to require such demonstration, in view of the fact that its resources are not unlimited.

2. Institutions will continue to vary widely in the nature and intellectual level of their educational programs. Some institutions will emphasize liberal arts, humanities, and sciences; others will emphasize engineering and technology, while still others will emphasize vocational areas such as business, computer programing, home economics, industrial arts, and so forth. Some institutions will have programs that will be completed satisfactorily only by individuals with a rather high level of intellectual ability and rapid learning capacity; other institutions will have programs that are geared to individuals of lesser intellectual ability

1. The notion of symmetry implied here is not the same as the notion implied in some other parts of the report of the Commission on Tests, namely that the student should have as much right to learn about colleges he might choose as colleges have to learn about him. These two notions of symmetry are independent and unrelated; neither excludes the other, nor are they in conflict in any way.

and slower learning rates. Even in institutions that themselves contain a variety of programs designed for different types of students, there will be need for information about the varying potentialities of students for these programs.

3. Students' performances on tests can afford one good and valid source of information on potentialities. While test performances are not the only source of such information, students will continue to want to use their test performances as evidence of potentiality, and institutions will continue to accept, and in most cases require, such evidence along with other kinds of evidence. (It would be interesting to investigate the consequences of making the taking of tests *optional* for students in certain cases.)

4. It would be feasible from the standpoints both of scientific research and of administrative considerations to develop a series of tests that would better indicate differential potentiality for educational programs, and that would have a better distributive effect, than the present SAT. (The present SAT tends to have a negative distributive effect in that it is geared more for selecting students for the better institutions than for indicating types of institutional programs from which the student is most likely to profit.)

The Present SAT

The SAT is in truth a test of *developed* abilities, depending both on general intellective capacities to learn and on an accumulation of knowledge and skills acquired through education in, and experience with, the verbal and mathematical aspects of this nation's culture. The SAT-Verbal sections emphasize verbal skills—knowledge of English vocabulary, word usage, and reading comprehension—while the SAT-Mathematical sections involve the ability to deal with quantitative and geometric-spatial concepts. Both sections also measure reasoning and inferential ability, SAT-Verbal in the verbal domain and SAT-Mathematical in

the quantitative domain. Typically, the correlation between SAT-Verbal and SAT-Mathematical scores has been about .65 in the population taking the SAT; this reflects not only the common involvement of the reasoning element, but also the fact that both sections call for ability to comprehend *printed* language and ability to answer questions at the required pace. (It cannot be denied that there remains a "speed" element in the test, at least for a substantial proportion of the population, even though its importance has been reduced in recent years.)

From the standpoint of factor-analytic studies, therefore, the SAT reflects at least four "factors" of ability: (1) verbal knowledge—that is, knowledge of vocabulary and ability to understand language; (2) ability to deal with quantitative and spatial concepts; (3) ability to reason with concepts either in verbal or quantitative terms; and (4) speed in test-taking. The two scores that are reported reflect different proportions of these abilities.

There is logic and massive evidence to support the proposition that the skills measured by the SAT in its present form are required at fairly high levels if the typical student is to succeed in, and profit from, his educational experience in colleges and universities, particularly the ones that are more selective and that emphasize liberal arts and sciences in their programs. Learning at the higher-education level involves acquiring information, skills, and principles from books, lectures, oral discussions, and other educational media that carry verbal discourse. Some degree of verbal skill is required even in the less selective institutions, and even in the "free universities" organized by students at some campuses. (In fact, one has the impression that "free universities" are for the most part organized by and for students with high degrees of verbal skill. Of course, the students in these "free universities" would likely abhor the idea of setting up admissions requirements for them, least of all requirements based on admissions test performance.) It can be said, then, that verbal and reasoning skills are highly relevant to success in higher education, in nearly every type of educational program that exists or

that might be conceived. Quantitative reasoning ability is also relevant, but perhaps to a lesser extent; it plays a particularly important role in scientific and technological programs.

There is some uncertainty about the degree to which these skills can be modified. The bulk of the evidence available suggests that verbal, mathematical, and reasoning skills as measured by the SAT are acquired relatively slowly throughout the individual's preuniversity years, and that they cannot be quickly or easily modified, even when the student has high motivation to do so. In the case of students who have had average educational experiences but who make low scores on the SAT, one may estimate that even a year of rather intensive remedial instruction in verbal and reasoning skills would not generally suffice to make a dramatic improvement in test performance or in potentiality for success in higher education. Several studies have led to the same rather discouraging conclusion for groups of "educationally disadvantaged" students. However, a number of colleges and universities have had some success with admitting low-scoring educationally disadvantaged students and giving them the special attention they need to succeed. One must note that the students admitted to such programs have generally been hand-picked on the basis of various kinds of information other than SAT test scores. It would seem that at least some of these students had potentials that were not adequately measured by the SAT.

If the assumptions underlying this brief are accepted, the above discussion leads to the conclusion that some aspects of the present SAT must be retained in the Board's program, but that the SAT must be modified and expanded to make it a more effective and multipurpose instrument. For the great majority of students with "average" educational experiences, it must be shaped so that it will more efficiently and differentially measure the skills that are most relevant to success in higher education. At the same time, it must provide a better means of measuring the educational potential of candidates who have for one reason or another been educationally disadvantaged.

Possible Changes in the SAT

An SAT can be envisioned that would look more like a test battery consisting of a number of component parts than the omnibus test that it now is. Even allowing for a half-hour experimental section, it should be possible in a three-hour testing period to garner more information about the student than is provided by the present test with its two scores, SAT-Verbal and SAT-Mathematical. The score report would contain four or five separate scores, enabling the student to learn more about his abilities and prospects and permitting the admissions officer to get a more detailed picture of the candidate. Whereas the present SAT tells the student about his chances of success in the more selective institutions, a new SAT would also inform him about his chances of success in a wider variety of types of institutions and programs.

The following changes can be suggested:

1. To yield more discriminating scores, the verbal knowledge and verbal reasoning elements of the SAT should be more clearly separated by appropriate item-analysis and test-construction procedures. The verbal knowledge elements should have their reasoning components reduced in importance, yielding a score that would mainly give evidence of how well the candidate can comprehend language. The reasoning elements, on the other hand, should have the verbal knowledge components reduced in importance, yielding a score that would indicate how well the student can reason with materials he already understands. Presumably, the former score would be largely a function of the individual's education and general reading experience, while the latter score would be less influenced by these factors and be more predictive of success for individuals with educational disadvantages.

2. Consideration should be given to the desirability of reducing in importance the "mathematical" elements in the SAT. If an SAT-Mathematical score is reported at all, it could be based on a

shorter test (rather than the two sections now used). Reducing the mathematical sections in importance would not result in any great loss in validity for the majority of students, even for those students who might enroll in courses requiring quantitative reasoning at the more selective institutions. (The SAT-Verbal score is apparently almost as predictive as the SAT-Mathematical score for such courses.) Institutions whose programs are predominantly scientific and technological would be advised to rely, for admissions information, on mathematics achievement tests. The present College Board Mathematics Achievement Tests in turn might be expanded to include some materials of the type now found in the SAT-Mathematical sections. At the same time, there is some evidence that many educationally disadvantaged students are able to show much better performance on the SAT-Mathematical sections than on the SAT-Verbal sections: to the extent that such performance is a relevant indication of unrealized potential, weight is added to the argument that some features of the SAT-Mathematical sections should be retained in a revised SAT battery.

3. Some parts of the SAT might be administered essentially as listening comprehension tests—for example the verbal reasoning sections—with minimal involvement of the reading element, in order to tap the potentials of those who have good basic verbal reasoning ability but have special difficulty with reading. Such a test might in fact be equally effective and valid even for those with good reading ability. Alternatively, the verbal knowledge and verbal reasoning sections would be retained in printed form, but a separate listening comprehension section would be included.

4. An effort should be made to develop a section of the SAT that would better measure various learning capacities apart from developed abilities. Over the years, there have been indications in research literature that such learning capacities can be identified and measured, but there has never been a concentrated, major effort to develop the necessary instruments. Such tests

might better reveal the educational potential of students who for one reason or another have not had the advantages of a good education. Exactly what forms such tests might take would have to be determined by research. They might, for example, consist of work-sample learning tasks ranging in complexity from simple serial learning to more involved tasks calling for the learning of new verbal concepts, rules, and principles. In any event, every effort should be made to reduce the dependence of such tests on educational opportunity, vocabulary knowledge, reading ability, or the like.

5. Present methods of validating SAT items militate in favor of items that measure developed abilities specifically useful in the more selective institutions and against items or tasks that would measure learning potential. Insofar as the criterion is overall college success in typical liberal arts institutions, it favors items or tests that measure the extent to which students have already developed their abilities to the point of being comfortable in a scholastic environment that makes demands on previously developed knowledge. While this criterion may be useful for certain sections of the proposed new SAT, for example the verbal knowledge section, a series of different criteria should be used for the other sections. Success in junior colleges, vocationally oriented institutions, and other different types of institutions would be used as criteria. The criterion for the "learning ability" section would be one that measures the extent to which a student can develop his abilities in a college environment.

Recommendations

It is recommended that the College Entrance Examination Board:

1. Support research to investigate the feasibility of recasting the SAT along the following lines:

a. provision of a section or sections more clearly emphasizing developed verbal skills relating to language comprehension and

learning from language, with the reasoning component de-emphasized;

b. provision of a section or sections more clearly emphasizing ability in reasoning and inference that does not depend greatly on verbal skills;

c. de-emphasis of the quantitative sections of the tests, with provision for testing of developed ability in this area in specific achievement tests apart from the SAT;

d. administration of some parts of the SAT in an auditory mode, to reduce dependence of those parts on reading ability;

e. provision of a section or sections that would measure scholastic learning capacities or potentials as much as possible apart from developed abilities;

f. validation of SAT materials not only against overall absolute success in higher education (in various types of programs), but also against gains made in developed abilities.

2. Introduce on a gradual basis, if the above types of tests prove feasible and acceptable, a new and possibly renamed SAT, with appropriate dissemination of information about the test both to educational institutions and to candidate populations.

Record of Endorsement, Comment, Reservation, and Dissent on the Recommendations in *Possible Directions in Which College Board Tests of Abilities and Learning Capacities Might Be Developed*

It is recommended that the College Entrance Examination Board:

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f. validation of SAT materials not only against overall absolute success in higher education (in various types of programs), but also against gains made in developed abilities.

Endorsed by 19 members: Abelson, Blocker, Carroll, Coleman, Foster, Friedenberg, Gordon, Hechinger, Hersey, Holtzman, Hoy, Marland, Pace, Pearson, Prentice, Schlossberg, Shirley, Thresher, Tiedeman.

Hersey: "The third suggestion (c) under Recommendation 1, even with its proviso of achievement testing of developed quantitative abilities, will be perceived as working a hardship on disadvantaged students. This leads to a question: Since it is recommended that the 'developed' abilities be distinguished from, yet be kept in the same test with, reasoning skills and aural responses and learning capacities, would it not be desirable to include all of these and achievement tests in one overall 'test,' or battery of tests, yielding a series of differentiated scores? This would help to take the curse off reducing the quantitative component of the 'aptitude' test and shifting whatever emphasis it may provide into an entirely different category of test."

Marland: "This brief should declare straightforwardly the need for adaptation to the young people of minority populations

and others living in handicapped environments."

Prentice: "How important is the tendency for educationally disadvantaged students to show better performance on the mathematical sections of the SAT than on the verbal? Does Carroll's proposal do justice to that aspect of the problem?"

Schlossberg: "My endorsement carries a basic reservation."

Shirley: "On the whole I am totally sympathetic with the objectives and the direction proposed by Carroll in both Recommendations 1 and 2. There are, however, a few comments and perhaps slight disagreements.

"a. and b. This would be a good move, if it can be accomplished. Much of what Carroll says in his discussion on pages 3, 4, and 5 seems to indicate that this is difficult, since reasoning may depend largely on verbal ability. Certainly the process of verbalization calls for reasoning, and I sometimes feel that we think (in logical, reasoning terms) *only* when we move to verbalization. How much logical thought is a byproduct of language we do not know; experiments with other animals seem to indicate some connection. But if separation there can be, so let it be.

"c. Carroll's de-emphasis of the quantitative portion of the SAT seems again to be related to the importance of verbalization. In the two universities with which I have been connected, we have not found the high correlation between SAT-V and the science and engineering programs that Carroll suggests exists. We have found considerably higher prediction success with SAT-M. True, the Mathematics Achievement Tests help but little, even for ability-level sectioning.

"d. The question about the culture bias of the written language is nothing compared with the culture loading of the spoken. What spoken language? Must this oral portion of the examination be localized to the dialect of the particular community or the economic level and racial background of the individual?

"e. This was originally the purpose of the Scholastic *Aptitude* Test; these tests have come to test content achievement. We have

been told that this is all that can be done, since this is the thing that leads to success in college. It has long been my contention that this really meant that validation was against only one kind of higher education, represented by the New England liberal arts institution, which had little relevance to the complex public university. Personally, I don't care whether these tests measure one or the other, so long as they are helpful in placing students into situations in which they can be successful.

"f. A very important point, on which ETS should conduct research immediately. I have faith in this suggestion."

Thresher: "It would be captious not to endorse these mild, ameliorative proposals, all well within the established psychometric tradition. My only fear is that, by accepting this kind of list we delude ourselves into thinking the job is done. Acceptance must not preclude active experimentation with some of the more imaginative suggestions we have discussed, nor prevent us from working away from a 'package' SAT with set parts and into a wider flexibility of combinations. It should not imply uncritical acceptance of conventional test criteria such as college 'success.'

"If e. turns out to be possible, I shall be pleased and surprised.

"As to f., I see a certain circularity in using one test to serve as criterion for another."

2. Introduce on a gradual basis, if the above types of tests prove feasible and acceptable, a new and possibly renamed SAT, with appropriate dissemination of information about the test both to educational institutions and to candidate populations.

Endorsed by 19 members: Abelson, Blocker, Carroll, Coleman, Foster, Friedenberg, Gordon, Hechinger, Hersey, Holtzman, Hoy, Marland, Pace, Pearson, Prentice, Schlossberg, Shirley, Thresher, Tiedeman.

Shirley: "This certainly should be done. The College Board has been concerned that ETS does not perform more such experi-

mentation and research on these bread-and-butter programs of the two institutions. If this suggestion were made to the Board's trustees, I am certain they would be overjoyed. Let the Commission make this strong recommendation—both to the Board and to ETS."

General Comments

Hersey: "While I am very much in favor of the body of this brief, I still find myself uncomfortable with the first paragraph. Despite the disclaimer in the footnote, I feel that the two notions of symmetry *are* related, and antithetically so. The symmetry that the Commission has discussed as new and desirable seems to me to emphasize the reciprocal benefits of a process of choice in which colleges learn about applicants, applicants learn about colleges, and both learn about themselves; the symmetry in Carroll's brief seems to me to hark back to the status quo—a one-sided process of selection by a college of the students it wants. While the Carroll formulation does rather accurately describe things as they are, it tends to blunt the other more potential idea of symmetry. Furthermore, it does not seem to me to be essential to the logical argument of the brief, which might very well begin with what is now the second paragraph."

Tiedeman: "I disagree with the first assumption, at the beginning of the brief, despite the footnote. The right attributed to the student is contingent on the right exercised by the institution. Therefore it is not a student right, it is a student necessity because of institutional action. This is a symmetry with only one degree of freedom. It is the symmetry on which College Board work is now predicated. I would like to see such predication eliminated."

Redundant Testing

John B. Carroll

The Issue

Can the amount of multiple test-taking in college admissions testing be reduced while preserving the validity and meaning of the test scores and also preserving the present diversity of tests and the healthy competition among testing organizations and agencies?

Discussion

While exact figures are not available, there is considerable evidence that many students throughout the nation are now being required to take a number of more or less similar tests for college admission or scholarships or both when they apply to different colleges. Students and parents complain about the apparently needless time spent in taking tests beyond a reasonable number, and school administrators object to the undue interference in school programs caused by a multiplicity of testing programs. Besides the College Entrance Examination Board program, there are the American College Testing Program and the National Merit Scholarship Qualifying Program, as well as a number of special testing programs administered by private, state, and national agencies.

As noted above, the tests are generally similar to one another; all measure, with minor variations, the same sorts of abilities as are measured by the College Board's Scholastic Aptitude Test (SAT). One may presume, on the basis of some available evidence and by inference from general findings in the field of testing, that the intercorrelations among the various tests would be found to be quite substantial and in some cases almost as high as would be permitted by the test reliabilities. The tests have, however, been normed on different populations; this is one reason why it is difficult if not impossible to set up accurate equivalencies among scores from different tests. And even if equating experiments were conducted, there are many technical sources of error in the establishment of equivalencies. These technical mat-

ters have been discussed in detail in a paper that W. H. Angoff presented at the 1962 Educational Testing Service Invitational Conference on Testing Problems.[1]

The problem of redundant testing is also beset with delicate "political" problems. Many of the college admissions and scholarship tests are offered by private organizations (both profit and nonprofit) that are understandably occupied with protecting their interests. They operate in separate spheres and tend to be unconcerned about the overlap of those spheres as far as students taking the tests are involved. As a result, one group of colleges requires a certain admissions test (for example, the SAT), while another group (rarely overlapping with the first) requires another admissions test (for example, the American College Testing Program tests). Many students feel obligated to take both tests, to improve their chances of admission. On the other hand, it can be argued that the healthy competition among a number of different testing agencies and programs has resulted in overall improvement in testing procedures. It would be unfortunate to lose the benefits of this competition.

The solution to the problem of redundant testing, therefore, is partly technical and partly political.

On the technical side, it would be necessary to set up extensive equivalency studies to obtain more evidence about the similarity of the tests and the possibility of establishing tables of equivalent scores. One technique for establishing equivalencies has not been adequately investigated in this context: the technique of using a third variable. That third variable should be, it would seem, a measure of the criterion, that is a measure of success in college. Under this method, briefly discussed by Angoff, scores on two tests would be regarded as equivalent if they predicted equal values on the criterion. While subject to certain errors, this method is not subject to the same errors as the usual

1. "Can Useful General Purpose Equivalency Tables Be Prepared for Different College Admissions Tests?" in Anne Anastasi, ed., *Testing Problems in Perspective*. Washington, D.C.: American Council on Education, 1966, pp. 251–264.

parallel-form method, and its errors can be tolerated in the college admissions situation since they are precisely the errors that arise in prediction anyway. In fact, the method would reveal the nonexistence of scores, on a relatively invalid test, that would be equivalent to certain scores on a relatively more valid test; thus, tests would be put in competition for validity. Use of this method in research on test equivalence would not even require that students take more than a single test as long as all students involved in a given comparison have been measured on a common criterion variable.

There would be problems, of course, in selecting such criterion variables. In other briefs of the Commission on Tests it has been suggested that multiple criteria be used, and if tests such as the SAT are broken down into several components the problem of establishing equivalencies becomes even more exacerbated. Nevertheless, it should be possible to establish reasonably adequate equivalencies among different testing programs as such, even if some compromise has to be made with technical issues.

On the political side, measures would have to be taken to (1) get the various testing agencies to agree to cooperate in equivalency research, and (2) get the colleges to agree to loosen their admissions test requirements in such a way as to accept testing information from either of several testing programs. It is true that such measures might lead to a reduced volume of testing and resultant income for the testing agencies, but in the public interest such reductions should be tolerated and even encouraged.

Recommendations

It is recommended that the College Entrance Examination Board:

1. Propose to an organization such as the American Council on Education that it create a Council on College Admissions and Scholarship Testing that would invite the various testing organizations and agencies to join for the purpose of cooperating in re-

search that would lead to mutual agreements among themselves and the higher-education institutions concerned, whereby colleges would accept scores on different tests as equivalent for admissions purposes.

2. Propose that the research and development to be sponsored by this council be based on a method of establishing equivalencies in terms of equivalent predictions of criterion variables.

Record of Endorsement, Comment, Reservation, and Dissent on the Recommendations in *Redundant Testing*

It is recommended that the College Entrance Examination Board:

1. Propose to an organization such as the American Council on Education that it create a Council on College Admissions and Scholarship Testing that would invite the various testing organizations and agencies to join for the purpose of cooperating in research that would lead to mutual agreements among themselves and the higher education institutions concerned, whereby colleges would accept scores on different tests as equivalent for admissions purposes.

Endorsed by 17 members: Abelson, Blocker, Carroll, Coleman, Foster, Gordon, Hechinger, Hersey, Holtzman, Hoy, Marland, Pearson, Prentice, Schlossberg, Shirley, Thresher, Tiedeman.

Coleman: "I believe there are serious dangers of reduction of competition between testing agencies if the emphasis in such a Council as proposed is on equivalencies between tests rather than on acceptance of different tests by the colleges. Equivalence is necessary in order to compare students on a single dimension of college success. But if the tests from a single agency themselves become more differentiated (as has been proposed in another

brief by Carroll), then the use of the tests by admissions officers must itself undergo change, since these officers will not have a single score to use for comparison of students. What should emerge is the use of regression equations to predict performance in that college, and the various test scores would be variables in the prediction equation, with different weights in different colleges. With this use of the test scores (as is implied by Carroll's other brief), it becomes simple and straightforward for a college to use more than one testing program. One regression equation would be used for the test scores from one agency; another would be used for the test scores from a second agency; and still a third could incorporate test scores from both. Such an approach would also have the virtue of stimulating testing agencies toward diversity in testing, in order to provide tests that add to the existing predictive ability of current tests. In contrast, the creation of direct equivalencies tends to reinforce the existing single-test approach and to create more pressure for uniformity."

Not endorsed by 2 members: Friedenberg, Pace.

2. Propose that research and development to be sponsored by this Council be based on a method of establishing equivalencies in terms of equivalent predictions of criterion variables.

Endorsed by 16 members: Abelson, Blocker, Carroll, Coleman, Foster, Gordon, Hechinger, Hersey, Holtzman, Hoy, Marland, Pearson, Prentice, Schlossberg, Shirley, Tiedeman.

Foster: "Where possible."

Not endorsed by 3 members: Friedenberg, Pace, Thresher.

Pace: "Considering the likelihood that the 'criteria' are changing, one runs the risk of equating tests on 'status quo' criteria or on criteria that will sooner or later be obsolete. The method is one that may tend to inhibit potentially desirable changes in the values and performances rewarded by higher education. At this point in time, I think it preferable to let compet-

ing test agencies each work toward adapting their tests to new criteria (as Carroll proposes to revise the SAT to serve broader purposes) rather than to equate present tests to some common criterion. I agree with Carroll that redundant testing is an annoyance for some students and high school administrators; but I think that this annoyance can be tolerated."

General Comments

Holtzman: "Nothing wrong with the proposal, but I'm skeptical of its working."

Shirley: "An excellent proposal and one that, in the national interest, I hope the Commission can help to implement as rapidly as possible. Such a recommendation should also be directed to the American College Testing Program, as well as to the College Board, to try to get cooperation rather than pure competition between them."

Thresher: "Obviously desirable as a practical measure within the limits of the current psychometric tradition, but should not be permitted to foreclose continued criticism and questioning of that tradition. We should be looking primarily at a wider range of experiment."

The Principle of Symmetry in College Choice

James S. Coleman

Modern society supports at many points a form of relation that is relatively new in the history of man. This is the relation between an individual and a large organization. Although this kind of relation has existed for some time, the proliferation of large organizations, and the extension of man's relevant environment beyond the borders of his community or neighborhood, have only recently made it commonplace. It arises in a man's employment by a large firm, in his purchasing from large producers or large retailers, in his dealings with large government. It arises in a student's relation to his college or university. And, what is to the point here, it arises first at the time of his choice of college and its choice and placement of him.

The principal problems that arise in this form of relation result from the asymmetry in size between the individual and the organization, and the asymmetry in power that stems from the size disparity. Ordinarily the organization can mobilize far more resources to further its interests than can the individual to further his. It has enormous economies of scale, since it is involved in similar relations with many individuals. In employment, this power differential between the company and the worker has been redressed through the construction of countervailing organizations, labor unions. In marketing, there is a similar discrepancy in size and resources between the producer or seller and the consumer. Unlike workers, consumers have had little success in developing organizations that can balance the power: there are few consumer-research organizations to balance the market research done for firms, and few organizations that provide information to consumers about the reliability of businesses to balance the credit bureaus used by retail firms.

In the choice of a college by a student, and of students by a college, this asymmetry in size arises as in employment and marketing, and it has produced a similar discrepancy in power. The colleges have marshaled a number of resources to aid them in realizing their aims in selecting and placing students. Colleges have established admissions officers, college recruiters, placement

officers, and others to determine how best to carry out the admission and placement they desire. In addition, they have created organizations, most prominently the College Entrance Examination Board, to provide them with systematic objective information on applicants that makes it possible to compare individuals.

The fact that the activities of the college admissions office, the placement office, and the external testing agency serve some of the interests of the applicant as well as those of the college has generally obscured the additional fact that they do so incidentally, and thus serve his interests less well than those of the college.

This situation can be easily seen by imagining a reversal of the power relation. If applicants were organized to have similar facilities at their disposal, they would very likely use them to provide detailed information about the colleges, to aid in their choice among colleges and to provide detailed information about various college programs as an aid in their selection of a program within college. These activities certainly would be incidentally in the colleges' interests, just as the present activities of college admissions officers and the College Board testing programs are incidentally in the students' interests, but they would no more solve the problems of choice facing the colleges than the activities of college admissions officers and the Board now solve the problems of choice facing applicants.

Thus the size asymmetry between the individual applicant and the college manifests itself principally in an asymmetry of information available to the applicant and to the college, information upon which each makes its choice. The college demands and gets specific comparable information from and about applicants: high school grades, the information it requests in its admissions application form, and often most important of all, scores on the College Board's Scholastic Aptitude Test and Achievement Tests, or comparable tests from another agency. The applicant has only hearsay, rumors, and whatever information the college chooses to exhibit in its catalog as the basis for his selection of

college and program of study. If he is fortunate, he has a friend attending a college, or he may visit the college and talk to a few students there and thus feel that he knows something of the atmosphere. The high frequency of college choices made on the basis of such insubstantial and unrepresentative experiences, as shown in the few studies made on college choice, is evidence of the absence of systematic means by which applicants can assess a college.

It might be argued that since the college has the same goal as the individual--both want him to have a successful college career—then the likelihood of a successful match will be as much enhanced if the college selection process is merely greatly improved as it would if the information asymmetry were redressed. Apart from the fact that such a solution is possible only for the highly selective colleges, and not in the open, nonselective institutions that account for most college students, there are further answers to this argument. First, it appears most reasonable that a match between two parties that results from the concurrent choices of both parties, based on accurate information, will be better than a match based on the choice of one party alone. Second, only if individuals have the opportunity to make choices, and to live responsibly with the consequences of their choices, can they acquire the independence and sense of responsibility that colleges aim to develop. The individual applicant does not want to be powerless and passive in the face of the college's decision any more than the college wants to be powerless to make its choice. Colleges would hardly find it satisfactory to be deprived of the sources of objective and comparative information on applicants they now have. Why should individuals find it satisfactory to be without objective and comparative information that could aid them in their choice?

The particular aspects of the college-applicant relation, and the information control and transmission that occur within it, can be expressed by comparing the resources of each, as in the following list.

Comparison of Applicant and College Resources

Resource	*Applicant*	*College*
Information about the other.	Information the college is willing to reveal in its catalog, combined with adventitious sources of information.	Specific information obtained from each applicant: completed application form, high school grades, standardized aptitude and achievement test results, and independent evaluation of applicant by letters from persons who know him.
Freedom to select information to be seen by the other.	Each college catalog emphasizes what the college believes to be most attractive. Certain information, such as attitudes of students toward the college, morale of student body, job-placement success of graduates, is difficult or impossible to obtain.	Each applicant must provide information that allows direct comparability with other applicants, based on a relatively standardized testing program.
Search mechanisms.	Adventitious sources of information through personal acquaintances, family experience, or geographic propinquity. Aid from guidance counselor in high school.	Scholarship testing programs to locate high-performing students, and sometimes recruitment policies using lists of scholarship winners or near winners. When college is motivated, as in the case of finding good Negro applicants or athletes, scouts and recruiters visit schools and in other ways search out desired applicants.

Resource	*Applicant*	*College*
Information about self and likelihood of a successful match.	Little objective information about interests, abilities, and knowledge of current students in the college or the college's special program of study. A few sources available, such as the College Board's *College Handbook* showing distributions of test scores in some colleges.	Experience with students of various types. In most systematic selection procedures, knowledge of college success of students with specific characteristics matching those of applicant.

This asymmetry in resources available to individuals and colleges by reason of size indicates only that the colleges have realized their goals first. Over a period of time, organization in the interest of applicants can be expected to develop, and with it both the resources to provide desired information, and the power to induce colleges to release the desired information. There are numerous indications of this development already: books describing colleges, published by commercial firms; suggestions (such as one made several years ago by David Riesman) for explicit consumer research on colleges, designed to benefit prospective applicants; measurement of the social and intellectual characteristics of college campuses by questionnaires administered to a sample of the student body, such as C. Robert Pace's *College & University Environment Scales;* the growth of organized student activity.

Redress of the imbalance could come about through the creation of explicit, organized groups to further the interests of prospective college students, or it could arise through the modification of existing institutions. If it is the latter, the disruptive period of transition that always arises in the struggle for power of a newly organized group will not occur. And if it is the latter,

the most obvious agency to incorporate and further these interests is the College Board itself. To do so will require serious modification of the very concept under which the Board operates, but this concept has already undergone slow evolution from the time of the original founding of the Board as a creature of the selective Eastern private colleges to the present day when the interests of secondary schools and applicants are directly taken into account (through the opening of Board membership to high schools, publication of college test-score profiles, pilot programs to inform disadvantaged youth of college opportunities, and sponsorships of research such as Pace's work on the characteristics of college environment).

The recommendations made here are not designed to restrict the colleges' autonomy in their choice—indeed, it is the virtue of the system of higher education in America that both colleges and students have full freedom of choice, subject to students' and colleges' interests in each other. Rather, the recommendations are designed to lead the College Board to aid applicants' choices as explicitly as it now aids colleges'.

One major asymmetry is the college's control of the systematic and quantitative information about itself that applicants receive, and the applicant's lack of control over the information that the college receives about him. Two modifications, embodied in the first two recommendations of this brief described below, are necessary to provide the appropriate symmetry that will aid the matching process.

It is recommended (Recommendation 1) that the Board systematically gather and publish relevant information about colleges, the nature of that information to be determined by a working group including representatives of colleges, students, and high schools. The information should include such items as statistics on test-score distributions of entering freshmen; the socioeconomic and geographic origins of entering freshmen; the number of students who drop out and transfer in each year and their reasons for doing so, including the proportion of en-

tering freshmen who complete college in the normal period; the number of each type of degree awarded; the proportion of graduates going on to professional schools, graduate schools, and various types of occupation; standardized statistics on class size, number of class hours of teaching per year per faculty member, and faculty-student ratio; a measure obtained from student questionnaires of the social and intellectual climate and focus of activities in the student body; estimates of the rates of deviant behavior, such as drug use, at the college. It should also include more qualitative information of interest to potential students: the nature of special programs offered by the institution, the opportunity for seminar and tutorial work, the flexibility of the course system and the grading system; and some information about the principal emphasis of the institution.

Such information, with its quantitative parts tabulated to facilitate comparison, should be provided in a periodic Board publication distributed for the use of potential applicants in high schools.

It is recommended (Recommendation 2) that the Board make more symmetric the control of information by colleges and by applicants. This can come about through modification of the testing program itself. Beyond the standardized testing that allows colleges to make direct comparisons of a few characteristics of applicants, the applicant should have the opportunity, through selection from a very wide variety of special tests ranging in subject matter from numismatics to algebraic topology, to exhibit his special capabilities, developed in or out of high school, that may be relevant to the colleges' interest in him. The college, in turn, may choose to take into account or to ignore the particular skills exhibited in a given test. Applicants have an enormous range of special skills, sometimes developed to a remarkable degree as a result of a hobby, which the present testing program masks, leaving them unable to show what they are best at and failing to give the college a full view of the individual capabilities of the student. A secondary beneficial effect of

this kind of opportunity would be that it would induce potential applicants to pursue independent lines of inquiry that attract them during adolescence, unconstrained by the belief that such work will only detract from their efforts to be accepted by the college of their choice.

In order to insure realization of the symmetry toward which these recommendations aim it is recommended (Recommendation 3) that the Board provide colleges and applicants with information about the other only if they are willing to allow information about themselves to be made available. In effect, data on applicants would be made available to a college only if it allowed a standardized set of data to be made available to applicants. (A college at present can insure that an applicant makes data on himself available; it may, as many colleges do, refuse to consider an applicant for admission unless he provides the full set of information about himself requested by the college.)

These three recommendations aim at increasing the symmetry of the Board's activities and the services it provides. It is clear, however, that the appropriate services themselves may change over time. Because of the governing structure of the Board, it is not possible to make an accurate assessment of the services that are most valuable for applicants in making their choice of college. Consequently, in order to implement the first three recommendations appropriately, a change in the governance of the Board is necessary.

The fourth recommendation (Recommendation 4) and the most fundamental, is that the College Board modify its governing structure, which now includes only representatives of one side of the college selection process, to embody a symmetry of college and applicant interests. This change can be made in either of two ways. One way is by including representatives of applicants' interests in the Board's membership and governing structure. Since there are no explicit organizations for applicants, it would be necessary to create appropriate representation in such a way that applicants' interests play a part in Board plans and

programs. The second way is by re-creating the College Board as a nonmembership organization, responsible to colleges and applicants alike—as two sets of clients—but to neither as its governing body. In that case, the governance of the Board would be independent of both interested parties and would be free to meet the needs of both through an assessment of market demands.

If the first form of reorganization is chosen, the simplest method of implementing it is to modify the representation from member colleges and secondary schools to include a student representation as well as institutional representation. This might create the possibility, in the already unwieldy membership meetings (based on a membership of more than 800 colleges and 300 secondary schools), of sharp division along interest lines. Such direct division need not occur, however, with appropriate structuring, because there are few if any decisions that must be made jointly by representatives of both applicants and institutions. The members representing colleges should have power to decide what information they require from applicants to aid in their selection among applicants. The members representing applicants should have power to decide what information applicants require from colleges to aid in their selection of colleges. Thus some activities of the Board should be subject to review by one set of members; other activities of the Board should be subject to review by the other set of members.

Restructuring of the Board could be formalized in a somewhat different way by creating a parent organization, under which there would be two subordinate organizations: the present Board with its present membership, and another organization named something like the "College Selection Board" whose members represented applicants' interests. The parent organization would not be responsible either to colleges or applicants, but the two subordinate bodies would be responsible to their respective memberships.

If the second general form of reorganization is chosen, the College Board would merely reorganize as a nonmembership

organization. It would provide services both to colleges and applicants, with the interests of both expressed as interests of clients.

These are various possible forms that a symmetric governing structure could take. Appropriately structured, there is no need for confrontation politics or deadlocks between the two major interests, because college interests should be the controlling voice in certain decisions, while applicant interests should be the controlling voice in other decisions.

This structural change is the most essential change of all, to insure that the Board develops the appropriate mechanisms for acting as a true intermediary between colleges and applicants, and to pursue the interests of both in assuring a successful match. For while specific recommendations can be made from the vantage point of the present about mechanisms to introduce symmetry into the matching process—such as the first three recommendations made here—the future will bring new problems that can be addressed only if the Board is structurally symmetric in the interest of both parties.

Recommendations

It is recommended that the College Entrance Examination Board:

(1) Systematically gather and publish relevant information about colleges, the nature of that information to be determined by a working group including representatives of colleges, students, and high schools.

(2) Beyond the standardized testing that allows colleges to make direct comparisons of a few characteristics of applicants, provide the applicant with the opportunity, through selection from a very wide variety of special tests ranging in subject matter from numismatics to algebraic topology, to exhibit his special capabilities, developed in or out of high school, that may be relevant to the colleges' interest in him.

(3) Provide colleges and applicants with information about

the other only if they are willing to allow information about themselves to be made available.

(4) Modify its governing structure to embody a symmetry of college and applicant interests.

Record of Endorsement, Comment, Reservation, and Dissent on the Recommendations in *The Principle of Symmetry in College Choice*

It is recommended that the College Entrance Examination Board:

1. Systematically gather and publish relevant information about colleges, the nature of that information to be determined by a working group including representatives of colleges, students, and high schools.

Endorsed by 20 members: Abelson, Blocker, Carroll, Coleman, Cross, Foster, Friedenberg, Gordon, Hechinger, Hersey, Holtzman, Hoy, Marland, Pace, Pearson, Prentice, Schlossberg, Shirley, Thresher, Tiedeman.

Pace: "A lot of the information about colleges will not mean anything to high school students or their parents unless it is expertly interpreted by the College Board."

Prentice: "Who can be 'representatives of students'? I urge that college students help describe their colleges and that high school students be asked what they wish to know about colleges, but I cannot support the idea that these resource people are representatives in the same (political) sense in which high schools and colleges are represented by their officers."

2. Beyond the standardized testing that allows colleges to make direct comparisons of a few characteristics of applicants, provide the applicant with the opportunity, through selection from a

very wide variety of special tests ranging in subject matter from numismatics to algebraic topology, to exhibit his special capabilities, developed in or out of high school, that may be relevant to the college's interest in him.

Endorsed by 18 members: Blocker, Carroll, Coleman, Cross, Foster, Friedenberg, Gordon, Hersey, Holtzman, Hoy, Marland, Pace, Pearson, Prentice, Schlossberg, Shirley, Thresher, Tiedeman.

Foster: "If possible."

Pace: "With reservations. It is probably not feasible to develop a lot of esoteric tests. But one can ask students about such special interests and accomplishments."

Prentice: "Numismatics has remained in this brief despite earlier criticism. I consider the example frivolous and likely to detract from the value of Coleman's recommendations. What college will care about such matters?"

Not endorsed by 2 members: Abelson, Hechinger.

3. Provide colleges and applicants with information about the other only if they are willing to allow information about themselves to be made available.

Endorsed by 17 members: Blocker, Carroll, Coleman, Cross, Foster, Friedenberg, Gordon, Hechinger, Hersey, Holtzman, Hoy, Marland, Pearson, Prentice, Schlossberg, Thresher, Tiedeman.

Prentice: "Probably there would be no problem about Recommendation 3 in practice, but it does seem that both applicant and institution should have a degree of choice about the particular information submitted. The recommendation might be interpreted to mean that a college could be excluded from the Board's services if it declined to provide all information on some standard list. It is conceivable that a panel might recommend the inclusion of information (salaries, religious composition, political affiliations) that a particular college would, on principle, decline to provide."

Not endorsed by 3 members: Abelson, Pace, Shirley.

Pace: "I doubt if this is necessary. It should be a goal but not a prerequisite for action."

Shirley: "Blackmail is not needed; colleges will, if reasonable requests are made, comply."

4. Modify its governing structure to embody a symmetry of college and applicant interests.

Endorsed by 15 members: Blocker, Carroll, Coleman, Cross, Friedenberg, Gordon, Hersey, Hoy, Marland, Pace, Pearson, Prentice, Schlossberg, Thresher, Tiedeman.

Pace: "The possibilities for restructuring the College Board that Coleman mentions are intriguing, and I would like to see all of them explored. I agree that the structure of the Board membership needs to be brought into the twentieth century.

"The match between applicant and college may or may not be successful! The basic gain is that both parties will know that they have been involved in the decision."

Prentice: "I am much less certain than Coleman is about the fundamental importance of structural changes in the Board. With rare exceptions we assume that patients' interests are met by physicians and students' interests by educators. The notion that enlightened altruism cannot exist troubles me. I am also convinced that very few eleventh- and twelfth-grade students know enough about their educational needs to contribute effectively as voters or policy makers (as distinguished from resource people)."

Thresher: "I think we all agree in principle, but the difficulties are very great and insufficiently analyzed. The question is *how*."

Not endorsed by 5 members: Abelson, Foster, Hechinger, Holtzman, Shirley.

Foster: "Not in any form yet suggested."

Holtzman: "Probably impractical to consider, although I would endorse it if it can be worked out."

Shirley: "Not practical—either to abandon the Board or to have half of the membership transitory."

General Comments

Abelson: "I agree that a more symmetrical relation between student applicants and institutions is desirable. However, Coleman's Recommendations 3 and 4 go too far. Recommendation 2 is desirable but probably impractical."

Foster: "I am in favor of better information about themselves and colleges going to students, but I have heard no well-informed student asking for power in the admissions process; this being based on insufficient information and experience on the part of students, would be chaos.

"One aspect of the 'market' must still be considered for some years to come. As long as there is a scarcity of places in the most popular colleges and universities we are in a 'seller's market,' and those colleges and universities will inevitably have more 'power' than their applicants. However, even those institutions should cooperate in providing applicants with all possible valid information to facilitate suitable choices by prospective applicants."

Marland: "There still is an unresolved detail: how actually does the student representative to the central governing body get identified, selected, elected, and so forth?"

Can Testing Contribute to the Quest for Community among Students?

Edgar Z. Friedenberg

The accepted function of aptitude and achievement testing is to identify, select, and appraise the best qualified individual competitors for membership and preferment within a meritocratic hierarchy. So far as I can recall, this has not been seriously questioned within the Commission on Tests even by myself, though I have fumbled toward expressing my continued dissatisfaction with this assumption.

This assumption, of course, limits and channels consideration of the testing function. It permits the Commission to question whether the Board is testing the right things—that is, whether the aptitudes and achievements measured are socially and individually relevant and appropriate. But it also implies that if the present tests are not testing the right things the most serious and unfortunate consequences will be that (1) individual competitors will suffer a biased adverse appraisal because their particular strengths have not been recognized and validated and (2) candidates who are test-wise, or saturated with middle-class patterns of response to competitive school situations, will gain an unfair advantage in scoring higher than their actual aptitudes warrant; they will become "overachievers."

The efforts of testing agencies, consequently, become directed toward increasing the heterogeneity of rewardable response, to avoid forming a test-wise "elite" from which students with other equally or more admirable qualities are excluded. This is a commendable concern, when one considers what such an elite is like. The universal use of short-answer, standardized tests as arbiters of advancement has undoubtedly contributed to the dominance of the empirical, fact-oriented cognitive style that leaves our society unable to respond to necessarily ambiguous aesthetic and moral judgments. Conversely, a people dedicated to competition and manipulation surely find their social preferences sustained by the kind of testing that has evolved. Granted the College Board, Robert McNamara follows.

This does not, of course, mean that testing, or the College Board, cannot serve quite different functions. We do not, how-

ever, as a Commission, seriously consider really different possibilities. We worry about whether the Board's tests are keeping the underclass out of the American poker game, and search for procedures that will deal them in—there must be some kind of test they would do better at than middle-class kids do. But the game is not so much a poker game as a crap game, and some young people have decided not to take any more crap. Most of our effort seems to me directed at keeping the underclass from contributing to their number; we want to make sure the middle class continues to run the only game in town, even if this means finding ways of involving in it people who really don't want or know how to play. If they will only consent to train for competition, we will find some way for them to experience success —at least in school.

I am far more interested, however, in seeing the College Board respond to the thrust of student discontent that is directed against the crap game itself, and against the assumption that the most serious function of a college is to maintain an arena in which individuals can compete against one another under handicaps designed to compensate for the unfair advantages of class. Education is shared experience, and only that; and the less continuity there is among those who share an educational institution, either between themselves or between their present and their past, the less profound and intense the educational experience is likely to be. There is, in short, something to be said for the educational use of tests that group together people who have enough in common to allow them to establish a community. The difficulty lies in *what* they have in common; tests that select out for a common reward people whose special excellence is in competition and the fragmentation of experience are not going to bring together a group who are likely to enrich one another, or to care for those dependent on their leadership.

I would therefore like to see the Board consider offering not merely achievement and aptitude tests but diagnostic tests that would permit colleges and students to select each other with

due regard for prospective compatibility. There are many devices that might be used for this, but the most direct, involving least invasion of privacy, would be a paper and pencil group instrument designed to furnish a profile in terms of the categories developed by Henry Murray for the TAT (Thematic Apperception Test), along with an institutional typology of the sort devised by George Stern at Syracuse University for assessing institutional climates. Together, these would supply enough information to allow both the student and the college to anticipate the degree of fit between them. Of course the most congruent combination should not be chosen—the desired amount of discord could be intentionally sought in the most expressive possible combinations. In making this proposal I do not mean to suggest that congruence between persons and institutions is determined only by psychological considerations but that relevant social-class variables would express themselves as psychological differences—otherwise they would hardly be relevant. A liberal and permissive school ought, I believe, to be able to defend itself against an influx of punitive, authoritarian, or extremely passive-dependent people, but it ought not to be permitted to exclude any social class or ethnic group as such. The psychological instrument, so long as it is permitted to retain its natural cultural contamination, should be quite sufficient.

As a measure totally unrelated to the above procedurally, but still directed toward the end of contributing to the quest for community, I urge that the Board offer high school juniors and seniors, or college students intent on transfer or graduate study, the opportunity to take tests for the purpose of obtaining scores interpretable by reference to national norms, in lieu of grades and, if legally possible, in lieu of school attendance. In this way certain kinds of people who possess and can display quite conventional forms of achievement, but who are likely to prove unacceptable to school personnel and to be forced to accept either poor credentials or slow stultification, could hope to preserve themselves intact. This procedure is, in effect, the converse of

the usual proposal for seeking new kind of tests for identifying talent among the "culturally deprived," but still subjecting them to institutional discipline and endorsement before recognizing their gifts. The consequence of my proposal would be to limit society's suzerainty to those skills and traits it could openly and officially demand as requirements, while preventing the implementation of informal demands that, if expressly made, could not readily be defended. My conviction that this would contribute to community among students is based on my belief that informal institutional demands of the schools are usually explicitly dehumanizing and that the best protection for the civil liberties of students is to be found in distinguishing sharply between society's right to demand certain skills of every citizen, and its practice of requiring that these be exhibited as aspects of a pedantic and constricted pattern of tastes as well.

Recommendations

It is recommended that the College Entrance Examination Board:

1. Offer not merely achievement and aptitude tests but also diagnostic tests that would permit colleges and students to select each other with due regard for prospective compatibility.

2. Offer high school juniors and seniors, or college students intent on transfer or graduate study, the opportunity to take tests for the purpose of obtaining scores, interpretable by reference to national norms, in lieu of grades and, if legally possible, in lieu of school attendance.

Record of Endorsement, Comment, Reservation, and Dissent on the Recommendations in *Can Testing Contribute to the Quest for Community among Students?*

It is recommended that the College Entrance Examination Board:

1. Offer not merely achievement and aptitude tests but also diagnostic tests that would permit colleges and students to select each other with due regard for prospective compatibility.

Endorsed by 17 members: Blocker, Carroll, Coleman, Foster, Friedenberg, Gordon, Hechinger, Hersey, Holtzman, Hoy, Marland, Pace, Pearson, Schlossberg, Shirley, Thresher, Tiedeman.

Foster: I endorse the development of such tests for use only by experienced and well-trained counselors with students. I do not endorse their use by colleges to select students, a practice that would be difficult if not impossible; the use, for admissions purposes, by colleges of "personality tests" would be unsuitable for private colleges and inapplicable for public.

Hechinger: "My endorsement is with some reservations—largely based on my concern that colleges might become too homogeneous in composition and purpose. Thus, I support the principle of Recommendation 1 only if assurance of breadth of selection and safeguards against ideological domination (political as well as educational) can be provided."

Shirley: "Detached from the inflammatory, truculent justification given by Friedenberg, this recommendation is reasonable. There is some indication that he may feel the tests would have use for determination of nonacademic (hippie) goals, but even that might not be a bad thing for both students and colleges."

Not endorsed by 2 members: Cross, Prentice.

1 member abstained: Abelson.

2. Offer high school juniors and seniors, or college students intent on transfer or graduate study, the opportunity to take tests for the purpose of obtaining scores, interpretable by reference to national norms, in lieu of grades and, if legally possible, in lieu of school attendance.

Endorsed by 17 members: Blocker, Coleman, Foster, Friedenberg, Gordon, Hechinger, Hersey, Holtzman, Hoy, Marland, Pace, Pearson, Prentice, Schlossberg, Shirley, Thresher, Tiedeman.

Foster: "Endorse, except for the phrase 'and, if legally possible, in lieu of school attendance.' This ignores all educational gains except those testable, as in a formal course. Although I, too, hope for some 'credit' allowed, as Friedenberg suggests, a college education will lose much of its value if it comes to provide only testable subject matter and academic skills."

Hersey: "There seems to be some danger that in the end it would be the achievers, those who have the habit of quickness in mastering and besting the system, who would benefit most from the provision of such tests and scores, rather than the mavericks and independents whom the recommendation is intended to protect."

Schlossberg: "This brief was fun to read: lively, pointed, stimulating. And because Friedenberg has such a fresh approach I hesitate to criticize. However, much as I agree with Friedenberg's criticisms of the schools, I do not feel that a brilliant 14-year-old who can pass all the examinations would psychologically be ready for college. Despite the 'dehumanizing' effects of school, this is better than placing a brilliant youngster in a social situation with which he is not ready to cope."

Not endorsed by 2 members: Carroll, Cross.

Carroll: "I really do not understand this recommendation. Perhaps I could if it were better spelled out. In any case, one implication of the recommendation to which I would probably ob-

ject is that the College Board would in effect offer tests that would substitute for examinations given by schools. It seems to me that such a system would go beyond the Board's scope, and I don't see how it would achieve the objectives Friedenberg mentions."

1 member abstained: Abelson.

General Comments

Marland: "I concur with this set of recommendations, but for reasons other than those exhibited in the text. The notion of compatibility between individuals and institutions leaves me with doubts, both as to the wisdom of a 17-year-old in assessing the reported vagaries of institutional character and the assumed competence and integrity of institutions of higher learning to orchestrate 'the desired amount of discord.' One possible outcome of the proposed arrangement would be that institutions of higher learning would become all blue or all green or all mauve (that would be like beige institutions, calling for a common color made up of other, original colors, chemically or physically transformed).

"The brief seems to say that once a student reaches college, having suffered the damaging and dehumanizing influences of the schools long enough, all will be well. My own observations suggest that schools, within the unhappy protocols of present admissions testing systems, extend themselves to the point almost of perjury to advance young people to higher education, both in spirit (aspiration) and in fact (entry). However, I think the direct route to college by way of national-norm instruments is valid for some. Most 16- and 17-year-olds need more growing up psychologically at home, however, before being cast upon the doubtful mercies of the college system.

"This paper implies, on page 2, that all the elementary-secondary world orbits around tests (empirical, fact-oriented, and so

forth) leaving no space for aesthetic and moral growth. This overstates the influence of tests and understates the meaning of public schools.

"Nevertheless, for good reasons, I endorse these recommendations."

Pace: "I endorse the principle of this proposal, but I *reject* the methods proposed to carry it out and also reject the ideology or assumptions that seem to lie behind these methods."

Prentice: "The statements that 'education is shared experience, and only that' and that there is something to be said for grouping together 'people who have enough in common to allow them to establish a community' are expressions of a highly personal educational philosophy that deserves elaboration and justification. Needless to say, it could be interpreted as a justification for complete educational separation among social classes, and I doubt that the Commission would support such a radical view without strong empirical support for it."

Thresher: "I endorse these recommendations because they cut through much of the artificiality of current practice, but I recognize that they will bring other problems. This, like other briefs, points out a direction for experiment, not a proposal for abrupt action.

"I think Friedenberg overstresses the possibilities of artificially arranged compatibility through the medium of a 'composed' group. This practice in itself is highly manipulative and anti-Friedenbergian. It implies the legitimacy of classifying people and determining their destinations accordingly. It would seem, rather, that compatibility is best brought about by allowing and helping kindred spirits to find each other in the midst of a heterogeneous multitude. There will be more such, as the average size of institutions increases, even though there will still be 'specialty shops' (Riesman's phrase) such as St. John's, Bennington, and Caltech.

"Maximum diversity is, in itself, immensely educational. The idea of a small, congenial minority happily projecting its own

special perspectives on the world, unchecked by any real diversity of skeptics, does not strike me as good education. If we are to protect the kind of people Friedenberg likes from those McNamara likes, we are in duty bound also to do the converse. Thus both groups in a very real sense suffer a curtailment of educational breadth.

"Friedenberg almost but not quite questions the divine right of every college to select its own students—a right taken for granted in all these briefs. I could hope for some stress on the obligation of colleges to accept a reasonable cross section of the public, and their willingness to be judged by what they can do with such a group, without the adventitious aid of prior superselection."

Toward a Qualitative Approach to Assessment

Edmund W. Gordon

Much of the impetus for the development of a technology of assessment related to intellective function and achievement resulted from and has been maintained by a supply-and-demand approach to access to education and distribution of educational opportunities. Access to a limited supply of educational opportunities has been guarded by selection procedures that prior to the twentieth century were based on the prospective student's social status. In the pre-Reformation period access to education was limited to the political and religious nobility and later to other privileged classes, while the twentieth-century selection procedures have come to be dominated by the student's demonstrated or predicted intellectual status. Where the supply of opportunities has been limited great emphasis has been placed on the selection of students and the prediction of their performance when exposed to those opportunities. Binet's work in intelligence-test development was directed toward the creation of an instrument that could be used to identify those pupils who were likely to benefit from schooling. His admonitions that education also turn to treatment of those exposed as not likely to succeed were generally ignored. In a period of scarce educational opportunities, Binet's concern for the educability of intelligence did not gain favor. Society found greater utility in the promise of the predictive and selective validity of his new test.

This emphasis on selection and prediction has continued even though the social conditions that gave rise to it have changed. In recent years, we have seen in America a growing concern with universal access to secondary and higher education. The educational requirements of the nation are increasingly defined as post-high school educational opportunities for almost all youth and continued learning for most people. If this trend continues, selection and prediction can no longer be allowed to dominate in the technology of psychoeducational appraisal. Rather, the stage must be shared with an emphasis on *description* and *prescription*—that is, the qualitative description of intellective function leading not to the selection of those most likely to suc-

ceed but to the prescription of the learning experiences required to more adequately insure that academic success is possible.

Psychological testing obviously can be used to measure achieved development. From those achievement patterns, subsequent achievement in the same dimensions of behavior under similar learning-experience conditions can be predicted with reasonable validity. Thus people who have learned an average amount during one learning period (high school) may be expected to learn an average amount in the next learning period (college). However, adequate attention has not been given to the facts that psychological testing can be used to describe and qualitatively analyze behavioral function to better understand the processes by which achievement is developed, to describe nonstandard achievements that may be equally functional in subsequent situations requiring adaptation, or to specify those conditions in the interaction between learner and learning experience that may be necessary to change the quality of future achievements.

In the present situation confronting those concerned with access to higher education for larger numbers of young people and for youth from more diverse backgrounds than those from which college students were previously chosen, it is not enough to simply identify the high-risk students. The tasks of assessment and appraisal in this situation are to identify atypical patterns of talent and to describe patterns of function in terms that lead to the planning of appropriate learning experiences. It is therefore recommended that the College Entrance Examination Board immediately:

1. Explore possibilities for adding to its quantitative reports on the performance of students, reports descriptive of the patterns of achievement and function derived from the qualitative analysis of existing tests. The Board's existing instruments should be examined with a view to categorization, factorial analysis, and interpretation to determine whether or not the data of these instruments can be reported in descriptive and qualita-

tive ways, in addition to the traditional quantitative report.

For example, response patterns might be reported differentially for

A. Information recall
   (1) Rote recall
   (2) Associative recall
   (3) Derivative recall

or

B. Vocabulary
   (1) Absolute
   (2) Contextual

2. Explore the development of test items and procedures that lend themselves to descriptive and qualitative analyses of cognitive and affective adaptive functions, in addition to wider specific achievements.

A. In the development of new tests, attention should be given to the appraisal of
   (1) Adaptation in new learning situations
   (2) Problem solving in situations that require varied cognitive skills and styles
   (3) Analysis, search, and synthesis behaviors
   (4) Information management, processing, and utilization skills
   (5) Nonstandard information pools

B. In the development of new procedures, attention should be given to the appraisal of
   (1) Comprehension through experiencing, listening, and looking, as well as reading
   (2) Expression through artistic, oral, nonverbal, and graphic, as well as written symbolization
   (3) Characteristics of temperament
   (4) Sources and status of motivation
   (5) Habits of work and task involvement under varying conditions of demand

C. In the development of tests and procedures designed to

get at specific achievements, attention should be given to

(1) Broadening the varieties of subject matter, competencies, and skills assessed
(2) Examining these achievements in a variety of contexts
(3) Open-ended and unstructured probes of achievement to allow for atypical patterns and varieties of achievement
(4) Assessing nonacademic achievements such as social competence, coping skills, avocational skills, and artistic, athletic, political, or mechanical skills

3. Explore the development of report procedures that convey the qualitative richness of these new tests and procedures to students and institutions in ways that encourage individualized prescriptive educational planning. What is called for is a statement about the nature of adaptive function in each individual that lends itself to planning a way of intervening in and facilitating his development. Patterns of strength and weakness, conditions conducive to successful coping, conditions resulting in congruence and engagement or incongruence and alienation are examples of the kind of information required.

4. Explore the development of research that will add to understanding of the ways in which more traditional patterns of instruction will need to be modified to make appropriate use of wider ranges and varieties of human talent and adaptation in continuing education. It would be relatively useless to identify broader ranges of behavior if these did not have their representation in programs of instruction, and if opportunities for the use of these adaptive patterns in learning were not available to young people. Alongside modification of instruments of assessment and of procedures for appraisal there needs to be a considerable amount of attention given to modifying the curriculum and conditions under which teaching and learning occur.

It must be recognized that the proposals advanced in this brief are, at the present stage of development in human ap-

praisal, very much in the conceptual stage. There is some research but little completed work that can be used to implement such a program. Yet a serious commitment to the achievement of symmetry in the continuing-education entry process, to the broadening of opportunities for access to continuing education, as well as to the greater adaptation of continuing-education programs to the requirements of the extremely varied populations to be served—this commitment demands that answers be provided to the problems implicit in these proposals.

Recommendations

It is recommended that the College Entrance Examination Board:

1. Explore possibilities for adding to its quantitative reports on the performance of students, reports descriptive of the patterns of achievement and function derived from the qualitative analysis of existing tests.

2. Explore the development of test items and procedures that lend themselves to descriptive and qualitative analyses of cognitive and affective adaptive functions, in addition to wider specific achievements.

3. Explore the development of report procedures that convey the qualitative richness of these new tests and procedures to students and institutions in ways that encourage individualized prescriptive educational planning.

4. Explore the development of research that will add to understanding of the ways in which more traditional patterns of instruction will need to be modified to make appropriate use of wider ranges and varieties of human talent and adaptation in continuing education.

Record of Endorsement, Comment, Reservation, and Dissent on the Recommendations in *Toward a Qualitative Approach to Assessment*

It is recommended that the College Entrance Examination Board:

1. Explore possibilities for adding to its quantitative reports on the performance of students, reports descriptive of the patterns of achievement and function derived from the qualitative analysis of existing tests.

Endorsed by 18 members: Abelson, Blocker, Carroll, Coleman, Foster, Friedenberg, Gordon, Hersey, Holtzman, Hoy, Marland, Pace, Pearson, Prentice, Schlossberg, Shirley, Thresher, Tiedeman.

2. Explore the development of test items and procedures that lend themselves to descriptive and qualitative analysis of cognitive and affective adaptive functions, in addition to wider specific achievements.

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Foster: "This needs to be done, but the Board is not the proper agent to do it; it would be presumptuous for the Board to do much research in this area."

General Comments

Carroll: "This is an excellent statement, and I find that it accords quite well with my own ideas as to the ways in which research might be directed to yield more meaningful procedures whereby student characteristics are reported.

"There may be some semantic difficulty with the word qualitative. Any quantitatively expressed score can be said to have a qualitative aspect as soon as it is accompanied by a statement about the *kind* of function being measured. Already the SAT score reports imply qualitative information in the sense that they refer to two *kinds* of cognitive performance—verbal and mathematical. This concept could be extended to the various cognitive and affective functions alluded to by Gordon—that is, the scores would be quantitatively expressed but would be identified in qualitative terms. I would want to know whether Gordon accepts this interpretation.

"Anything more qualitative than what I have suggested would take one into the realm of purely verbal description. Several years ago Carl Helm at ETS experimented with computer-written SAT reports that interpreted the quantitative scores in purely verbal, qualitative terms. The machine would write a

prose paragraph based on the student's scores and other information. Perhaps Helm's technique could be extended to a much wider variety of test performances, but one would have to avoid the danger of making the resulting prose appear too mechanical and stereotyped. I wonder whether this kind of computerized score report would be satisfactory to Gordon."

Hersey: "If there were to be a rank order of undertakings proposed in various briefs of the Commission, I would place those proposed here very high on the list.

"Under (2), B, 3 and 4, it seems to me that a most vital appraisal would be of something within the categories of 'characteristics of temperament' and 'sources and status of motivation,' and combining them—namely, the factor of persistence, called 'drive,' the combination of interest and mobilized energy, which will not die and refuses to be denied. It is the underlying force of most achievement, and it is something that includes but is different from motivation."

Hoy: "A significant paper that supports the notion that the present tests are becoming not only irrelevant to the educational needs of American students but also obsolete.

"The brief significantly addresses itself to what must be done to change testing so that it can regain a contributory role in education. The problem emphasized here is the need for a new approach to testing that is neither destructive of the testing establishment nor utopian in vision, but rather a realistic way to move the College Board into more significant areas of endeavor.

"In several ways this brief sums up the central theme of the Commission's deliberations, especially Recommendation 4."

Marland: "The first three recommendations, in addition to calling for major reform in the College Board, call for a corresponding reform on the part of admissions officers in colleges. Should some attention be given to this in the brief?"

Prentice: "I think we are years away from useful instruments of this type. 'Exploring' such developments is fine, but some limits should be set to the open-ended search for useful measures.

Dollars? Time? I am not sure, but there should be some kind of cost-benefit analysis."

Shirley: "All these recommendations call for research, and this is certainly badly needed. Even with the answers in hand, however (and those may be years off), the implementation of these new educational ambitions would call for rather drastic changes in the educational (and social) patterns of our nation. This may be desirable, but the task is difficult."

Thresher: "These are all valid long-range goals, and they reflect Gordon's admirable insistence on educational goals that can be clearly defined and methodically arrived at and measured, in contrast to sporadic experiments too soon abandoned. But in the long, intervening period there will have to be a great deal more resort to loosening and broadening entrance requirements. Some rough-and-ready randomization of the admissions process will be needed, as a practical expedient. The Commission's report should reflect the concern to mitigate excessive and ill-directed selectivity."

A College Entrance Service

John Hersey

This brief proposes a service, presumably to be comprised of numerous machines and human beings, that would provide an approach to true symmetry in the process of entrance to higher education.

The ideal of such a symmetry depends upon the adequacy, relevance, and symbiotic usefulness of information available to the two parties to the transaction. I do not believe that symmetry can be achieved to the satisfaction of either party by providing to the college, on the one hand, personal and test data on the individual applicant, and to the student, on the other hand, either merely a detailed description of colleges to which he has already decided to apply, or, wanting such a decision, an overwhelmingly formidable description of the more than 2,000 institutions in the United States.

It should be possible to devise an exchange in which both the inputs and the outputs would be more nearly balanced and more explicitly useful in the process of choice than that. The reciprocal goals of the partners in this exchange would be for the student to find the handful of colleges, and eventually the one college, that would most nearly fit his needs and desires and talents, and for the college to find the students who, along with its faculty, would enable it to become a community manifesting its own best possibilities.

Inputs

Student input to the service proposed here would consist of a complex of results of tests of the sorts the Commission on Tests has discussed—aptitude, achievement, and diagnostic tests "that would permit colleges and students to select each other with due regard for prospective compatibility" (Friedenberg brief, page 33); guidance and reference comments on the student; high school records; descriptive and evaluative material on the high school and community from which the student comes; and something from the student about his own view of himself. An

attempt should be made to elicit from the student not only his special interests and bents, insofar as they are developed, but also some sense of his goals, his style of life, his sources of energy, and even his hangups, insofar as he is willing to share them.

College input would consist of information supplied by the institution; assessments of the institution by students, faculty, administrators, and students' parents, including results of measures of sorts described in Pace's brief (pages 87–99); and assessments of the institution by high schools that feed it students. This input would include "statistics on test-score distributions of entering freshmen; the dropouts and transfers, by cause, in each year, including the proportion of entering freshmen who complete college in the normal period; the distribution of types of degrees awarded; the proportion of graduates going on to professional schools, graduate schools, and various types of occupation; standardized statistics on distribution of class size, on number of class hours of teaching per year per faculty member, and faculty-student ratio; a measure obtained from student questionnaires of the social and intellectual climate and focus of activities of the student body" (Coleman brief, pages 19–32). It should also include, among numerical data, the size of the college, fees charged, financial aid practices, and geographic and sex distributions of students. Besides, more qualitative information of interest to potential students should be included (here I amend the Coleman formulation, going into far more detail in this section than in the one on student input because there seems to be far more extensive experience in testing and describing students than in describing and evaluating colleges): information about the principal emphasis of the institution (liberal arts, engineering, and so forth); academic prerequisites; the nature of special programs and activities offered by the institution; compensatory programs, if any, for culturally deprived students; description of housing; opportunities for seminars and tutorial work, and for work-study experiences; the degree of flexibility of the course system and the grading system; major fields of

study offered, and requirements for major and minor course elections; religious affiliation, if any; the degree of flexibility as to the time required for the baccalaureate degree; a description of the setting of the college, whether urban or rural, and an account of its relationship with the community in which it exists; description of institutional governance, and machinery and practice of student participation, if any, in the decision-making process; evaluative material on academic departments; citations, by field of specialty, of particularly distinguished scholars and teachers on the faculty.

Outputs

The outputs to both parties would be of two sorts.

To the college, the output would be, first, an evaluation of the institution as to the statistical and descriptive items just listed, placed in perspective with comparable data about colleges with which it is competitive; second, a list, culled from the pool of candidates who have taken the College Entrance Examination Board tests, of applicants whose qualities and aptitudes might be considered particularly apt for the institution, and, with respect to the individual candidate, a legible and complex nonnumerical description of a human being, which would give a sense of abilities, of preparation, of interests, of motivation, of character, and of style—in short, of a whole person.

To the student, the output would be, first, a full description of him as a human being in relation not only to choice of colleges but also to a range of career and course and activity choices that might be most appropriate for him in the future—in other words, informed diagnostic material; second, full descriptions of, let us say, 6 to 10 institutions (whether or not members of the College Board) that could best serve his needs and abilities.

Can It Be Done?

At present there is to my knowledge no service that supplies the ambitious two-way functions proposed in this brief. The Committee on Guidance of the College Board has already been exploring existing one-way services,[1] of which there are at least seven that are computerized, that have been called, as a group, college-locater services, and that attempt to provide assistance to students in narrowing the universe of higher educational institutions to a reasonable number of choices for the student to explore further; as well as a few that are not computerized. Evidence has been assembled about seven computerized services: Interactive College Suggesting System; the service operated by ETS for the National Scholarship Service and Fund for Negro Students (NSSFNS), and five of the leading mail order services that provide lists of colleges on the basis of questionnaires completed by students.

"The Interactive College Suggesting System (ICSS) operated by Interactive Learning Systems, Inc. (ILS), is the only operational service in which the student has direct access to a data bank. In general it does not suffer from the flaws evident in other computerized services. It places its services in a larger guidance context, one that is judged to be reasonably consistent with current theories of vocational development. Although it does not provide a rationale for its list of . . . characteristics recorded in the data bank, it may be that school personnel explain this to students using the service. Its data bank is generally limited to those characteristics on which factual information is readily available. There is no need to inform the user of how his specifications are

1. "College Locater Services." Unpublished report prepared for the Committee on Guidance of the College Entrance Examination Board. In this version of my brief I have quoted from the report as indicated and have drawn on the report for much information about the flaws found in most of the services and the advantages and disadvantages of the two kinds of services that might be developed.—J.H.

manipulated; the student provides the specifications and any changes in them. The chief drawback to the service is that it requires the availability of supporting hardware for the service. . . .

"The NSSFNS program is designed to serve a particular purpose and a particular clientele. It has an operational structure involving schools and NSSFNS, unlike any other computerized service utilizing a questionnaire-batch-processing system. The specifications come largely from the sponsoring organization, and feedback to the system is routinely available from counselors and institutions."

The five remaining services tend to suffer from three or more of the following flaws, according to the report: the service tends to indicate that the list of institutions provided is the answer to the student's quest rather than merely a point of departure for further investigation; does not provide a rationale for the input criteria offered to the user; does not provide an opportunity for the user to rank criteria in order of their importance to him; does not inform the user of the resources for its own data bank; does not provide for frequent systematic updating of its data bank or fails to inform the user of such procedures; gives the student an opportunity to choose among the characteristics of colleges which, if taken, depends upon qualitative judgments about colleges; does not tell the user how it manipulates the variables in arriving at a list of institutions for consideration; arbitrarily rejects criteria the user has specified as important to him but fails to provide any explanation of this fact; does not distinguish in its output between the institutions that meet all the criteria the user has designated and those that possess only some of these characteristics; has no recognized, representative professional group (or no group at all) as an advisory or managing body and has no cited procedure for evaluation and research.

A computerized service could apparently be developed that would not possess these characteristic shortcomings. There would be two basic alternatives in developing such a service: so-called batch processing of standard multiple-choice question-

naires to be filled out by the applicant; or an interactive service, in which the student, in effect, converses with the computer. I will not go far in discussion of these technical matters, except to say that the former would be cheaper, would be similar to other services ETS already provides, would be highly standardized and therefore probably safer; but by the same token it would be relatively rigid, with less opportunity for the student to take initiative, to probe, and to consider alternatives. The standardized questionnaire is liable to be perceived by the student as being something like an adversary test; he is the passive party in the process. The full symmetry that I am proposing in this brief would not be possible with the questionnaire system. The interactive system has the advantages of letting the candidate explore options and consider alternatives; it lends itself easily to productive repeated interviews, for responses are stored and remembered; the student is the active agent. But the system would be more expensive, both to develop and to operate, and it would require hardware, either mobile or permanent.

I would urge the College Board to reject the cheaper, easier, and safer course of entering the college-locater-service field exclusively through a questionnaire-based system. This would leave the more flexible and open interactive-system possibilities to outfits far less able to build upon experience, responsibility, and reputation than the Board and ETS, which have already accumulated those assets; indeed, there is already evidence of the scandalous danger of leaving the field to money-makers, quacks, and short-cutters.

But even more serious from my point of view would be the failure to grasp and develop the full implications of the idea of symmetry that has been brought forward by the Commission on Tests. While the two-way College Entrance Service that I have attempted to describe would be enormously difficult and perhaps enormously expensive to develop, it seems to me not beyond the limits either of the imagination of the technicians now available to ETS and the Board, or of the technology as it already stands.

It could provide a tremendous step forward from relatively haphazard to relatively informed and mutually beneficial choices of students by colleges and colleges by students. I need not stress the urgency of this decision, for the opportunists are already at work devising inadequate solutions, and students are wild and colleges are desperate.

Simultaneous Operations and Research

This urgency speaks to the need for simultaneous development of both operations and research, and for the use of both printed and computerized techniques. To wit:

First, a limited two-way service based, so far as college input is concerned, upon printed materials to be assembled from the large mass of "hard" information about colleges that is already available, with step-by-step introduction of evaluative and qualitative measures as they are refined through research. What is desperately needed here is something more useful to the student than a massive compendium—concretely, a categorizing and indexing device, subtle enough to be tolerably reliable yet simple enough to be manipulated by an unsophisticated applicant, a device with which he can narrow the universe of colleges on his own initiative, digging out for himself from the bewildering mass at least preliminary information about the relatively small number of colleges that fit his needs.

Second, and simultaneously, research of the sort urged in the Pace brief (pages 87–99).

Third, and simultaneously with the others, operational work with computerized services. Rather than developing a service from scratch, the Board might purchase one of the existing college-locater services, which might then be carried on and refined by stages as research would dictate.

These more or less headlong procedures would be justified on the ground that an imperfect symmetry would be better than the present gross asymmetry; and the expense and difficulties in-

volved in moving on both operations and research at once would be justified by the relatively rapid realization, by these means, of a truer symmetry, and by the probability that while rigorous research would keep operations "honest," the very fact of on-going operations would force the Board to focus on substance and content while, and not after, wrestling with the immense technical problems inherent in the challenge of total symmetry.

Recommendations

It is recommended that the College Entrance Examination Board:

1. Carry the principle of symmetry to its full realization by establishing as soon as possible a College Entrance Service, the purpose of which would be:

a. to guide applying students to colleges that would fit their needs and abilities;

b. to assist institutions in building student populations that, along with their faculties, would enable them to become communities manifesting their own best possibilities;

c. to supply diagnostic and guidance materials on themselves to individual students;

d. to supply evaluative materials on themselves to colleges.

2. To this end to undertake simultaneously both operations and research, using both printed and computerized techniques.

Record of Endorsement, Comment, Reservation, and Dissent on the Recommendations in *A College Entrance Service*

It is recommended that the College Entrance Examination Board:

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Endorsed by 18 members: Abelson, Blocker, Carroll, Coleman, Foster, Friedenberg, Gordon, Hechinger, Hersey, Holtzman, Hoy, Marland, Pace, Pearson, Prentice, Schlossberg, Thresher, Tiedeman.

Not endorsed by 1 member: Shirley.

2. To this end undertake simultaneously both operations and research, using both printed and computerized techniques.

Endorsed by 18 members: Abelson, Blocker, Carroll, Coleman, Foster, Friedenberg, Gordon, Hechinger, Hersey, Holtzman, Hoy, Marland, Pace, Pearson, Prentice, Schlossberg, Thresher, Tiedeman.

Not endorsed by 1 member: Shirley.

General Comments

Foster: "It would be very difficult to determine the causes of dropouts and transfers, as is suggested in the fifth paragraph of the brief.

"Speaking of the output to the student, (page 53) it may be a bit early for some students to have developed some of these characteristics and interests.

"About the needed indexing device mentioned under 'Simultaneous Operations and Research': one thinks of the indexes now used progressively to narrow the field toward identifying a

bird from a book—color, size, shape, habits, and so forth."

Pace: "I think we can take some major steps in the direction Hersey proposes. But there is no past or present research that can honestly tell a student what institution is best for him or that can tell a college which applicants, among those who are academically qualified, will be 'best' for the institution. Moreover, the criteria for admission are being changed, and the criteria for success in the institution are also being changed. The best we can do, I think, is to describe each to the other (the student and the college) in ways both can understand.

"I can endorse the thrust of Hersey's brief. But some of the particular pieces of information he recommends are neither feasible to obtain, clearly interpretable, nor defensible by current knowledge or research. This is why a research program as he recommends and as I recommend, needs to run parallel with an active program. I fully endorse his final suggestions on simultaneous operations and research."

Shirley: "Though I am sure that most of the Commission members are sympathetic to the idea of the Board's being more concerned about furnishing information about colleges and universities to the students, Hersey's proposal is idealistic and unrealistic. As a result, I cannot endorse these recommendations.

"In the first place, I do not feel that the Commission should issue demands to the Board; it should consider philosophies and policies and make recommendations. The wording of this proposal is almost in the nature of a demand, since it indicates that implementation of this program should be immediate, preceding study, analysis, or experimentation. Undoubtedly a program such as Hersey suggests should be available. But to implement it in the present state of the information-retrieval art would require a massive national effort that the priorities of our times would not endorse.

"Universities have spent literally hundreds of thousands of dollars to get a small portion of this information and to put it on computers so that it is available for analysis. Hersey's proposal

calls for gathering total information from all the colleges and universities of the nation and for keeping this information totally current. It calls for gathering and analyzing total information on the whole person on literally millions of individual college applicants. It calls for bringing these two awe-inspiring data banks together in a complete analysis. Compared to this task, the federal census or the national tax collection is child's play—not counting the fact that computers are not yet uniform enough nor are memory banks massive enough to approach this task. Hersey's idea *is* a good one, but the Board could not finance it nor could the resources of higher education implement it.

"To endorse an impossible proposal is not wise. So I can sympathize, but I cannot recommend, this idealistic suggestion."

Thresher: "The objectives sought by this proposal are good, and I favor its adoption, but the Commission members need to retain a sense of the boundary conditions and limiting factors that would condition the effectiveness of any such plan. We need to ask ourselves how far it would cure what ails higher education.

"The 'symmetry' principle aims at redressing an unbalance in a system of reciprocal choice. Thus the proposal would best serve the small, affluent fraction of college applicants whose access to the national market is unhindered by high tuition or by travel cost. Among colleges it would best serve the small, affluent group of institutions who make a big thing of selectivity. Another and larger segment of students (say the 80 percent or more who attend college in their home state) have only a restricted choice in any case. For them the plan would be useful, but to a lesser degree. For the large and growing number (perhaps soon to be a majority) who go first to their local community college, choice scarcely exists. Their problem is not choice, but an improvement of education.

"The proportion of students in public institutions will continue to grow. For these, the selection of a congenial or stimulating environment will often take the form of a choice among

schools or programs in a large, nearby institution rather than choosing a college as it is known now.

"The proposal may tend to implement the extreme, elitist views of many faculty members as these search the lists for young disciples who will become copies of themselves. It does not directly encourage the strongest institutions in one of their major, neglected obligations: to demonstrate their ability to reach and stimulate a representative cross section of intelligent youngsters, rather than giving themselves all the breaks in advance by superselection. If a basketball coach accepts only seven-footers, you can't really tell whether he is a very good coach or not. I cannot conceive that even had such a plan been in successful operation during the past five years, the basic situation would have been greatly changed, in which students are wild and colleges are desperate.

"The breakdown of elitist admissions policies is already well under way, with various special arrangements for culturally deprived minorities. Discipline-oriented scholars are encountering the world in large, interdisciplinary chunks (or chunks for which no discipline has been invented). This trend will have profound effects on the prim, compartmented world of academic man. There are the major areas that need reform: admissions policies that take account of the learning process to be more problem- and project-oriented. But college choice will continue to play a sufficiently important part to justify the proposal as presented."

Abelson: "This brief, as well as the brief by Schlossberg, Hoy, and Gordon ('Regional Centers for Guidance in Continuing Education'), appears to me to include laudable objectives. However, when looked at in total, implementation of all these proposals by the College Board does not seem feasible. The costs would be too great. If these recommendations are to amount to more than rhetoric, further steps would be necessary. Either there must be a proposal for a large-scale federal subsidy or the Board should arrange a scale of priorities. In view of emerging patterns of government interference with education, I would be against proposing federal subsidy."

Educational Civil Rights and the College Board

John C. Hoy

The promise of equal educational opportunity for all students remains a distant though compelling myth of contemporary life. The College Board, although peripherally involved in several important areas of the educational civil rights movement, has yet to put the full capacity of its resources, prestige, and organizational power to work in assisting member institutions in resolving the burning issues related to this struggle.

As an organization the Board is only beginning to break a pattern of token integration. Until such time as the composition of the staff, membership committees, and Board of Trustees reflects the ethnic and racial composition of the American education community the College Board will be handicapped in confronting the problem. Governance, as well as program and policy development, of the College Board will emerge more fully as such constituents are included in discussions of the profound issues faced not only by the Board and its member institutions but also by that broader student population the organization hopes to serve in the future.

It is therefore recommended that the College Board take the following preferential steps:

1. Increase minority-group representation on the College Board staff to a level that more fully reflects the society at large and the commitments already shown by member institutions.

2. Change the composition of committee membership to reflect the same pattern.

3. Seek to shift the membership of the Board of Trustees in a similar direction.

Action on all these recommendations should come with a minimum of delay, and improvement in one area should not excuse lack of improvement in another. As the College Board moves to increase the level of minority-group representation it should also carefully attempt to use the insight and capabilities of minority-group staff to the fullest extent possible. To date the Board has not done this.

In addition, a review of the present financial commitments

of the Board as well as a complete analysis of available supplementary funds in the area of equal educational opportunity programs should be developed, with a view toward a dramatic extension of activity in this area.

In essence, the recommendation is for a quantum jump in College Board personnel, structure, and finance that will permit the organization to face internally as well as externally the most serious domestic problem facing the United States.

Programs that fall short of a major change in the basic nature of the Board will undoubtedly fail to engage the organization in the level of activity and commitment that is not only required but morally just if the practice of the College Board is to become consistent with its professed goals.

At a time when the complexity, the pressures, and the tensions related to the educational civil rights movement have profoundly affected member institutions, College Board leadership may be able to reassert a measure of perspective and vision within the education community if it is able to move closer to a structure that is representative of the whole society.

Recommendations

It is recommended that the College Entrance Examination Board:

1. Increase minority-group representation on the College Board staff to a level that more fully reflects the society at large and the commitments already shown by member institutions.

2. Change the composition of committee membership to reflect the same pattern.

3. Seek to shift the membership of the Board of Trustees in a similar direction.

4. Review its present financial commitments and completely analyze available supplementary funds in the area of equal educational opportunity programs, with a view toward a dramatic extension of activity.

Record of Endorsement, Comment, Reservation, and Dissent on the Recommendations in *Educational Civil Rights and the College Board*

It is recommended that the College Entrance Examination Board:

1. Increase minority-group representation on the College Board staff to a level that more fully reflects the society at large and the commitments already shown by member institutions.

Endorsed by 14 members: Blocker, Carroll, Coleman, Friedenberg, Gordon, Hersey, Holtzman, Hoy, Marland, Pace, Pearson, Schlossberg, Thresher, Tiedeman.

5 members abstained: Abelson, Cross, Foster, Prentice, Shirley.

2. Change the composition of committee membership to reflect the same pattern.

Endorsed by 14 members: Blocker, Carroll, Coleman, Friedenberg, Gordon, Hersey, Holtzman, Hoy, Marland, Pace, Pearson, Schlossberg, Thresher, Tiedeman.

5 members abstained: Abelson, Cross, Foster, Prentice, Shirley.

3. Seek to shift the membership of the Board of Trustees in a similar direction.

Endorsed by 14 members: Blocker, Carroll, Coleman, Friedenberg, Gordon, Hersey, Holtzman, Hoy, Marland, Pace, Pearson, Schlossberg, Thresher, Tiedeman.

5 members abstained: Abelson, Cross, Foster, Prentice, Shirley.

4. Review its present financial commitments and completely analyze available supplementary funds in the area of equal educational opportunity programs, with a view toward a dramatic extension of activity.

Endorsed by 15 members: Blocker, Carroll, Coleman, Friedenberg, Gordon, Hersey, Holtzman, Hoy, Marland, Pace, Pearson, Prentice, Schlossberg, Thresher, Tiedeman.

4 members abstained: Abelson, Cross, Foster, Shirley.

General Comments

Carroll: "Worthy goals, these, but I would hope they would not be achieved in a 'mechanical' way. I doubt that the Board should attempt to make a 'quantum jump' in the representation of minority groups (one should remember that there are many minority groups and subdivisions thereof) on its staff or committees. The minority group personnel must be qualified and effective—it is difficult enough, we all know, to obtain qualified and effective members even from 'majority' groups. For example, it would probably not be too difficult to identify qualified minority-group people to serve on certain committees."

Cross: "I do not think this is an appropriate area for Commission involvement. It strikes me as rather gratuitous. I have no reason to believe that the Board needs the Commission's free exhortations in this area."

Hersey: "A minor question of fact: In the first sentence, I don't believe that 'the promise of equal educational opportunity' is a 'myth.' The promise exists. It is uttered often. That it is not being fulfilled rapidly enough is evident, but that doesn't make it a myth."

Holtzman: "I agree strongly in principle and hope that the recommendations can be implemented. My only reservation concerns the possibility that the recommendations might be embraced so literally that the quality of participation and leadership in the College Board and its committees might be seriously impaired. Unfortunately there aren't large numbers of minority-group members on our college faculties, and those who are tend to be overworked by incessant demands on their time and en-

ergy to be 'representatives' on committees, and so on. I am opposed to merely filling slots to dress up the looks of things in the name of proportional representation. Obviously we have a long way to go, however, before this becomes a problem!"

Pace: "I assume that Hoy knows his facts, but I'd like to be assured. For I should suppose that changes in these directions have been discussed in the College Board and that progress has been made. I'm against sin, but I'm also against criticizing a redeemed sinner. This is why I feel some reservation about endorsing the recommendations. It may be that the brief is gratuitous; if so, I would rather commend the Board for its actions than berate it for its past."

Prentice: "In regard to the first three recommendations, I do not know how fully the College Board's current staff 'reflects the society at large' nor whether there are indeed member institutions that have made more effective commitments than the Board.

"There is an element of quicksand in this sweeping proposal. Who represents minority groups? Is every black like every other? Is a Mexican-American necessarily the best choice for a given position merely because other Mexican-Americans have not been chosen?

"The emphasis, it seems to me, must be on removing every trace of those prejudices that may have prevented the Board from employing the most useful or most highly qualified people on account of their membership in some minority group. We must not substitute new prejudices that in their turn base hiring practices on the candidate's parentage rather than on his qualifications."

Shirley: "The Board has given (and is giving) leadership in the matter of racial equality."

A Proposal for a Comprehensive System of Testing for Job Entry

Sidney P. Marland

The College Entrance Examination Board, without necessarily meaning to, has become a universal symbol of academic quality and prestige in the eyes of high school students, parents, and teachers. To be preoccupied with taking the College Board's tests is viewed as important, worthy, desirable, and commendable. Not to be so preoccupied is viewed as something less important, less worthy.

One may readily observe that this is as it should be. American society is strongly committed to the development of the intellect. Historically the College Entrance Examination Board has served higher education in helping to identify, select, and develop the most academically promising young people. Allowing for all the gaps in the identification process and all the admitted limitations of testing, the fact remains that excellence and all that this term loosely implies in the education system ultimately finds one of its major yardsticks in the College Board's tests. In at least some parts of the country a student is viewed by his school, his peers, his parents, and social institutions, first, according to whether or not he even took the tests; then, of course, if he enjoys this status he is viewed according to his scores.

The yardstick is not confined to students alone. It is not uncommon for school systems to examine themselves, particularly their high school faculties, in relation to the median scores attained by a given class, and for high schools within a city to compare notes (perhaps secretly) on their "success" with high scoring students or class averages. The high school that has not entered very many contenders, or perhaps shuns comparing scores earned with colleagues across town, is not likely to be regarded with respect within the system.

That the Scholastic Aptitude Test (SAT) and the Achievement Tests are symbols of excellence is a fact. Psychologists and col-

Author's note: This brief has been strengthened by emendations and extensions offered by Margery Foster and Clyde Blocker.

lege admissions officers may deplore this condition as unsound, exaggerated, invalid, and unintended, but it is a fact. Altogether, it is probably a good thing, giving some system and standardization to the vagaries of a pluralistic school system that possesses few other constants. The great virtue of the College Board is its systematic design for facilitating entrance into varying colleges by students of widely varying school and geographic backgrounds. It is this important virtue that suggests the need for developing a corresponding arrangement for systematically matching high school students with a variety of jobs.

A very large proportion of young people are excluded from the select society that the Board has unintentionally constructed. If it is estimated that in the near future as many as half of the young people will come under the benign mantle of the College Board, and other similar testing services, the other half will not. Notwithstanding the swift increase in numbers of youth taking the examinations, and the corresponding increase in numbers engaging in postsecondary education, a ball-park guess would suggest that given the full age-grade population in the public secondary schools (retaining the dropouts) fully half of the young people will not attend postsecondary school in the foreseeable future. At least some of them will undertake a period of full-time work in some form before returning to education. The vast majority of these 50 percent do not, at high school age, see themselves as likely candidates for higher education.

Indeed, this "other half" to a large extent do not see themselves very clearly at all. Some of them may have undertaken the "business curriculum" (by whatever name), and some have had other kinds of vocational training, but the majority are engaged in that educational euphemism called the general curriculum. This means that the student will graduate from high school without intentions for more education and without a salable skill. There is no longer a productive place in our society for someone who has this kind of limited educational experience.

While his individuality may have been enriched by his "general education," he is without the means to apply his energies to a productive task.

There is an unfortunate and silent history underlying this condition. In its simplest form it is the involuntary or voluntary expression of disdain by a significant proportion of American people for those whose work is performing services or tasks that involve manual or manipulative activity. Endemic snobbery has tended to classify the manual-manipulative task too simply as nonintellectual, noncreative. While our public schools over the years should have been enrolling well over 60 percent of the high school students in vocational-technical programs (the rest of the students planning for higher education), typically only 5 to 10 percent have been engaged formally in skills training. The remainder have been caught up in a modified college preparatory curriculum, considered somehow more respectable than vocational education, even though college preparation was not intended, either by the school system or the student. But the academic program, culminating in the College Board's SAT for some, has been the singular symbol of capability for entering the "managerial" class or the society of intellectually elite. No other common symbol of a favored social stratification has been available for those whose interests and talents lie in other directions; excellence by definition has resided in the college preparatory program. The noncollege preparatory student is therefore relegated to something less than excellent.

It is here proposed that an institution be created that will give to vocational-technical study the same level of respect and prestige that the liberal arts studies now have, and will recognize excellence in areas that are not primarily intellectual. This is not an easy task in a society whose values have so brightly illuminated the virtues of higher education. This proposal is not intended to diminish the importance of the present academic program. On the contrary, it seeks to elevate the arts of the world of work to the level of the liberal arts as socially desirable goals

for students. It is emphasized that a student is not obliged to follow one "track" or the other, as there are no fixed tracks. Most likely he will find his fulfillment in a combination of academic and vocational-technical studies, whether his goal is college or a job.

The proposed structure for the examination of those young people directly entering the world of work (to which they would bring salable skills *as well as* intellectual competence) would serve at least as many individuals and probably more than will be served by the College Board in its present form. The national trend toward the comprehensive high school points clearly to the objectives of insuring that every person complete high school and then either enter higher education or use the salable skill he learned there. This leads to the corollary objective that calls for immediate and appropriate employment of all high school graduates not entering higher education, homemaking, or the armed forces.

The high level of mutual interest and cooperation between colleges and secondary schools has effectively supported the work of the College Board. The greatly broadened testing plan proposed would call for a correspondingly high level of mutual interest and cooperation between the secondary schools and the business and labor communities. This is a more complex and challenging interrelationship than the one between schools and colleges; however, there is strong evidence to suggest a readiness in business and labor to work much more closely with the secondary schools.

The proposal assumes that the idea of a comprehensive high school will grow and be realized eventually. The high school curriculum must offer a wide range of vocational and technical programs, including the appropriate general studies necessary for adult citizenship and vocational competence, along with the college preparatory program. Roughly half the comprehensive high school's students would be enrolled in the vocational and technical programs with appropriate general and academic

courses, and half in college preparatory programs. Many of those entering higher education will enroll in two-year community colleges or technical schools.

The articulation of the curriculum between the technical program of the high schools and the postsecondary technical institutions becomes highly important. For example, a young man engaged in studying computer programing in high school (or a young woman interested in practical nursing) should proceed, if he wishes, to planned levels of increased curricular sophistication in his postsecondary training. The comprehensive examination in vocational and technical study has relevance to this transition. The technical institution, or the employer, and the student would have information for admission and counseling purposes, just as colleges and students have such information through the College Board's tests.

The basic theme underlying this proposition is that all young people possess potentials for excellence in one form or another. The historic bias favoring intellectual excellence, as revealed in contemporary tests such as the SAT, has tended to foreclose from systematic recognition the young person whose talents lie in other directions. Society and the teaching profession have given high theoretical prominence to individuality in schooling. Yet the reality of the College Board introduces a prejudice that implies a repudiation of those individual personal qualities, other than intellect, that the learner possesses. Therefore, since vocational-technical education comprises, or should comprise, the learning emphasis for fully half the nation's young people, the College Board is urged to broaden its spectrum of competencies tested to include personal qualities of career readiness not now included in the SAT. The unintended "tracking" imposed by the SAT would be stopped. Indeed, the comprehensive career-entry testing design here proposed would serve to obliterate the implications of high and low tracks.

At no time would a student be classified as exclusively college preparatory or vocational preparatory. He could always

choose to concentrate his studies in one direction or the other. Indeed, he could, with good precedent, enter college after two or three years of job performance, with increased maturity and resources.

The labor force in the United States now has about 55 percent of the people in service jobs as distinct from production jobs. Prior to 1960, more than half the labor force were involved in the production of goods rather than services. It is probable that by 1980, 65 to 75 percent of all working people will be engaged in service occupations. Also, many new occupations in the semiprofessional, paraprofessional, and technical levels have emerged since World War II. Competent employees for such jobs are sorely needed and remain in short supply. These occupations do not require a baccalaureate degree, but in most instances they do require secondary education or some post-high school education and training.

Examination of the labor force reveals a nonsymmetrical diamond configuration. The professions and high-level managerial, scientific, and technical positions occupy the top of the diamond; the overwhelming majority of the labor force lies in the middle of the diamond; and the bottom of the figure includes the rapidly declining number of unskilled and semiskilled jobs in our economy.

Adequate training for entering a job on the semiprofessional, paraprofessional, and technical levels requires secondary school or postsecondary school education of from about 1 year to 2½ years. It is important to note that formal training in an institution is essentially designed for competence required in an *entry* job. It must be assumed that virtually all workers above the totally unskilled level will receive additional training and periodic retraining made available by the employer in the plant or through an arrangement with a public or private educational institution.

The proposed testing institution would establish a valid measure of competence for job entry, whether on the completion of high school, or of postsecondary technical education, or both.

At present such job-entry testing is at best unorganized, and at worst nonexistent. Standardized tests are available in some fields of vocational and technical education; they may or may not be used by individual teachers or school systems. Entry into union-managed apprenticed trades generally requires at least performance testing, and there is apparently a tendency to "screen out" rather than to "guide in." Business and industry have varied types of job-entry examinations, administered internally or externally by employment offices. It is the intent of this proposal to bring consistency and order to the job-entry system for all fields of work that formal vocational-technical education offers now and in the future.

There is a great need for providing useful measures for the K-12 or K-14 span of experience for students whose competencies lie in directions other than academic. It would appear that the College Board, or a new organization, should immediately go beyond the SAT to provide measures of salable skills. While this brief does not go beyond this aspect of recognizing individual excellence other than academic, the discussion can be extended still further. For example, high school students have other categories of individual excellence that do not fall into either the SAT context or the salable skills context. Demonstrated competence in music or art, deep commitment and sensitivity to social responsibility, political and social leadership, athletic skill in many aspects that suggest adult careers or avocations—these are qualities of individual excellence that are ignored by the present culminating testing scheme. It is possible that the explorations proposed here in support of extending the culminating test to include vocational skills, may be still further extended by the experiment to include these more abstract qualities.

In thinking about greatly increasing the number of students tested, as well as increasing comprehensiveness of the content of the tests, great care must be taken to avoid redundancy and to insure the privacy of all students within the testing structure. As the proposed comprehensive system of testing takes effect, exist-

ing tests with similar scope or purpose should be eliminated. Indeed, some progress is already being made in this direction.

As to privacy, the proposed system of comprehensive testing would still rest on the professional integrity of responsible staff members, both in schools and in the field. The field will include, however, not only college admissions officers, as now, but also the whole of the employment world. Obviously the significant data describing a student must be transmitted systematically to the object agency (employer). The data must be honest and objective, just like the essential descriptions that now come from the secondary schools on college admissions application forms. The degree of privacy hinges largely on the integrity of the individuals compiling and receiving such data, whether the object is college entry or job entry. The significance this proposal has for a student's privacy lies in the fact that lay citizens share the job of appraising him for job entry. However, as lay members of boards of education are responsibly privy to virtually any information surrounding any individual in a school system, it seems reasonable to assume that people of corresponding integrity will be able to accept the responsibility of maintaining the student's privacy.

A basic concern related to the proposal of an organization for testing students' competence for job entry is the fact that there is doubt that vocational-technical education belongs in high school. Some people declare that the public schools should confine themselves to academic teaching and that postsecondary institutions or on-the-job training in business and industry should satisfy vocational-technical needs. There are also those who, viewing the swiftly changing technology in business and industry, hold that it is not efficient to train a young person in a given field because that field will change by the time he enters the work force. Such observations do not take account of the reality of high schools today. This proposal is aimed toward making the schools relevant to those young people not planning to attend college and suggesting the feasibility, even the attrac-

tiveness, of some plan other than immediate entrance into a typical college career. It is true that much learning will follow graduation in on-the-job situations. It is also true that the techniques of job performance are changing swiftly. Some competent observers declare that a worker today may have to change his work techniques as many as six or seven times in his working lifetime. But in this proposal it is held that the young person in school has to start to equip himself for job entry, acknowledging the changes that lie ahead. Part of his learning would be the very comprehension of the reality of change. Business and industry should not be expected, as they now often are, to provide remedial education in basic academic skills, nor to create a school for typists or welders or draftsmen or electricians. The student must have a starting point, with measurable competence in a salable skill, so that he can enter the stream of in-service growth and changing technology at whatever level his competencies suggest.

While the fundamental job-entry skills of the vocational-technical program are important, an equally important part of the high school program should be concerned with attitudes and personal qualities. The young person being educated for job entry must have extensive counseling, encouragement, and in most cases, successful field experience to help him toward being a well-developed person. The very fact that he has a job-entry skill has much to do with his psychological well-being.

For many young people, especially those from deprived circumstances in big cities, the schools have not been meaningful. Continuing exposure to a general curriculum, without tangible relationships to future employment, is understandably rejected. The high proportion of dropouts, ranging as high as 60 to 70 percent in some city schools, is unquestionably a product of curriculum irrelevance, at least in part. Further, the ascending tempo of student unrest, stridency, and hostility can be attributed to this same irrelevance. The schools are struggling to correct this condition. Their struggle would be significantly assisted

by the prestige attached to the proposed system of assessing vocational-technical education. The built-in goals, the new tangible sources of motivation, and the enlarged dignity of skill-centered programs envisioned in the universal testing system could go far to redress the dangerously low status afforded many secondary schools, especially in the cities.

It should be emphasized that in this recommendation a substantial change in secondary school curriculum is seen for about half the student population. As a larger proportion of the country's youth finish high school and more enter higher education and skill-centered employment, the curriculum must be reorganized to fit current realities rather than reflecting to so large an extent the traditions of the liberal arts experience for a professional-managerial and intellectual elite. Not only must basic content be modified, but there must be a reorganization of the relationships of academic disciplines to the newly established clusters of vocational-technical offerings. Lively urban school systems need to be engaged in the curricular evolution that comes with developing a comprehensive high school. The proposed testing system must reflect the changed curriculum.

Since American colleges and universities do in fact substantially influence the curriculum in the elementary and secondary schools, the College Entrance Examination Board may quite properly undertake a share of the responsibility for the reorientation of the schools so that they will more effectively serve the needs of all students. Thoughtful Americans are not likely to accept a theory of change in secondary school curriculum that has merely trickled down from leisurely reforms in higher education. The problems of the urban population have already reached the crisis stage, and the College Board has an opportunity to share in the search for solutions. The Board might well assume some initiative in restructuring secondary education through the processes proposed here. If indeed the College Board has been a highly influential party to the curriculum patterns of the academic program, as I believe it has, then this same influence

could well be brought to bear in the design of the vocational-technical programs aimed especially toward urban educational issues. Such an extension of the Board's function would suggest either a change in name or the creation of a counterpart organization.

There is much to be said for having all students participate in a single general measurement process at the end of high school. Such a measurement process would have certain common characteristics for all students and special elements related to vocational or college goals that would lead in many different directions. All parts would be equally useful, worthy, and respectable; no part would be viewed as possessing more prestige than another.

Accordingly, it is proposed that the College Board undertake or sponsor a major study of the proposition expressed in this brief, design a model, and conduct a pilot exercise to weigh the worth of the enterprise. The details of how to construct this proposed testing institution for vocational-technical competence require careful study. This proposal only states the problem and calls attention to the opportunity for a major breakthrough in present school organization and employment practices. The central message of the proposal is only partly the design of a system of mechanical arrangements for job-entry assessment. The most significant message of the proposal is that the abstract qualities of prestige, dignity, and worth associated with the vocational-technical tests and with the agency that sponsors and administers them would, in time, affect the vocational program as the present College Board tests now affect the academic program. Perhaps nearly all secondary school graduates will someday take a new form of College Board examination without sensing an implied value in one kind of post-high school plan as against another. It would be naive to suggest that all "managerial prestige" would be removed by the processes proposed here, but it is likely that the present disparity between the college preparatory and vocation preparatory programs can be sharply diminished.

Once this is achieved, there should be a change in the name of the College Entrance Examination Board, perhaps to Career Entry Examination Board or Continuing Education Examining Board. It would, as a single institution, carry out the present functions of the College Board and the new functions suggested in this proposal.

The present College Board should be used as a model for drawing up the new organization, keeping in mind certain facts and goals.

a. There should be a thorough assessment of the present vocational testing materials now available from all sources. Where these are found valid they should be used; in fields in which they are inadequate or nonexistent new testing materials should be developed.

b. The battery of tests should include measures of the student's achievement in basic academic subjects pertinent to the needs of the occupation for which the student is being assessed. These measures should probably be quite different from those used for predicting college success.

c. The design for the test program should include provisions for reporting the student's personal characteristics, including attitudes, self-discipline, responsibility, relations with peers, and so forth. It may include objective measurement instruments, appraisal by teachers and counselors, or both. Problems of student privacy should be considered.

d. A performance component of the test might include an arrangement for the establishment of a panel of lay evaluators in collaboration with appropriate professional staff members of the school. Each comprehensive high school might have several such panels regularly appointed, according to the general occupational category—that is, health sciences, construction trades, electronics, and so forth. The panel would include expert practitioners as well as ordinary members. The candidate would be judged by the panel on his demonstrated competence in the skill he has learned, and he would be formally certified for a partic-

ular level of job entry accordingly. Such a panel would be comparable to a board of education in service and responsibility.

c. The present effect of testing is seen by many young people as a "gate-keeping process," excluding rather than including many individuals. The spirit of the proposed system should emphasize affirmation, access, and supportive counsel. Accepting job placement as one of the goals of the system, it should be assumed that there is an appropriate job for every student who completes high school and looks for employment or further technical education. The testing design proposed should serve as the "gate-opener" to all young people, giving access at the entry level to which the individual's skills and interests are appropriate.

Following the practice of the present College Board, the new organization would give a student a score or rating expressing the level of competence he has achieved in relation to the entry-level criteria for the field of work he wants to enter. His score or certificate of performance would become his credential wherever he applies for a job. This, again, calls for the lively engagement of the business and labor communities in adapting their job-entry requirements to the new credential system. Superficially, at least, it would seem likely that the new system, when compared with current practice, would be welcomed cordially by employers.

Other possible indirect outcomes of this proposal should be viewed with interest. The presumed new battery of tests can be used not only for those who are consciously vocationally or technically oriented, but also for some college-bound youth. Its existence and effect might encourage some young people who would go to college for lack of any better alternative to consider nonacademic paths in a new light, influenced by the guidance program. When a student sees that a bricklayer can earn $18 an hour, own a boat and two or more cars, and vacation in Florida, a white collar job may not seem so attractive. If bricklayers or automobile mechanics or practical nurses were more highly re-

garded in our value system there might be fewer misfits in the nation's colleges.

The new test battery might also be used for two other guidance purposes. In an era of increased leisure time, shortages of skilled workers, and high prices, it may be more important to have an avocation—perhaps one that involves skilled work such as carpentry or electrical work. The nonintellectual and the intellectual person can derive much satisfaction from such pursuits. The new tests might point the way to an aptitude for an enjoyable pastime, much as an exploratory college course stimulates a student's interest in the scholarly arts or sciences.

Another use of the tests for guidance would be in on-the-job reeducation and adult education in industry. A new set of indicators of aptitude and entry classification should be welcome, and experienced employees could move on to better jobs through the systematic resources of the testing process. The results of such tests, furthermore, might induce employers to accept and train unskilled persons whom otherwise they would reject.

The suggested system of assessment measures is illustrative only, and it needs further scrutiny and extensive development. No attempt is made to identify what agency might undertake this program if the College Entrance Examination Board should find it inappropriate. There are, obviously, existing institutions that could bring experience and wisdom to the task. On the other hand, the extraordinary dimensions of this proposed program may call for the construction of a new agency. It is urged, however, that the Board undertake at least pilot programs, merging its present academic function with the broader coverage, while still, of course, maintaining the academic functions.

In any case, a major study of the issues and assumptions offered in this proposal appears to be warranted. Such a study, gathering the counsel and creative energies of scholars and practitioners should be undertaken, under the auspices of the College Board, the United States Office of Education, or perhaps both.

In viewing the idea of tests for vocational and technical job entry, it must be remembered that the transcending goal of the system is the enhancement of the learning environment for the very large number of young people, especially in big cities, who are untouched or rejected by the college-oriented traditions of secondary education. The goal of preparing well-developed people for entry to the world of work is paramount. The self-respect that should derive from the newly established importance of the vocational area of education is a basic ingredient of the design. Indeed, the *presence* of a universal testing arrangement and the *process* of its application may be more important influences on the behavior of young people than the ultimate *product* of job-entry machinery.

Recommendations

It is recommended that the College Entrance Examination Board:

(1) Take steps to increase greatly the scope of its testing program to include the measurement of student competencies other than those reflected in measures of academic promise for college entrance.

(2) Undertake initially a major study, including a pilot program to develop appropriate materials and procedures, of the feasibility of assessing qualifications and classifications for job entry and for postsecondary technical training.

(3) If the results of the study and the experience with the pilot program are promising, consider expanding its function to serve all high school graduates, including those entering the work force directly as well as those planning to go to college, and changing its name accordingly to "Career Entry Examination Board," or such other appropriate name as would accurately reflect its expanded clientele.

Record of Endorsement, Comment, Reservation, and Dissent on the Recommendations in *A Proposal for a Comprehensive System of Testing for Job Entry*

It is recommended that the College Entrance Examination Board:

1. Take steps to increase greatly the scope of its testing program to include the measurement of student competencies other than those reflected in measures of academic promise for college entrance.

Endorsed by 15 members: Abelson, Blocker, Carroll, Coleman, Foster, Friedenberg, Gordon, Holtzman, Hoy, Marland, Pace, Prentice, Shirley, Thresher, Tiedeman.

Not endorsed by 3 members: Hersey, Pearson, Schlossberg.

2. Undertake initially a major study, including a pilot program to develop appropriate materials and procedures, of the feasibility of assessing qualifications and classifications for job entry and for postsecondary technical training.

Endorsed by 15 members: Abelson, Blocker, Carroll, Coleman, Foster, Friedenberg, Gordon, Holtzman, Hoy, Marland, Pace, Prentice, Shirley, Thresher, Tiedeman.

Not endorsed by 3 members: Hersey, Pearson, Schlossberg.

3. If the results of the study and the experience with the pilot program are promising, consider expanding its function to serve all high school graduates, including those entering the work force directly as well as those planning to go to college, and changing its name accordingly to "Career Entry Examination Program," or such other appropriate name as would accurately reflect its expanded clientele.

Endorsed by 14 members: Abelson, Blocker, Carroll, Coleman, Foster, Friedenberg, Gordon, Holtzman, Hoy, Marland, Pace, Prentice, Thresher, Tiedeman.

Not endorsed by 4 members: Hersey, Pearson, Schlossberg, Shirley.

General Comments

Abelson: "I wholeheartedly endorse Marland's brief, which calls attention to very important deficiencies in current procedures. Implementation of the remedies he suggests should have a high priority."

Carroll: "I endorse these recommendations only insofar as they might lead to a pilot study to test their validity. I feel that there may be many obstacles—financial, social, and educational—to the implementation of these proposals. In certain areas the College Board would be competing with industry, labor unions, or professional organizations in the testing of candidates, if these proposals were carried out to the letter. Nevertheless, the proposals are in the right direction, and I feel that at least they deserve serious consideration."

Hersey: "I endorse without reservation Marland's thesis and his statement of the urgent need for the services he describes, but I feel that the College Board will have its hands full to effect the symmetry we have discussed in its role of facilitating entrance to higher education. It would be valuable, of course, to have the Commission endorse and support Marland's thesis and recommend that others take up the task."

Holtzman: "Some elements of this proposal could be combined with the plan for regional guidance centers in the brief by Schlossberg, Hoy, and Gordon. However, in Marland's brief there is too much emphasis on testing, I think."

Hoy: "If these recommendations are as far sighted as I believe they are, within a decade the College Board may well be devoting most of its energy to the assessment and encouragement of talents not limited to the aptitude measurements and

achievement tests of the 1950s and 60s.

"The Gordon and Marland papers combine to recommend a major and constructive departure for College Board programs that should have the effect of not only enriching the variety of tests but also dramatically broadening the Board's clientele.

"The testing programs implied by this paper indicate a continuing approach to career and educational planning and development for the individual—not one- or two-shot testing but rather appraisal, follow up, and reappraisal."

Pace: "I think the brief is an extremely important one.

On page 69 I am not sure that the point about the College Board's great virtue is a good one, because the Board doesn't really 'match' the student with the college; the SAT serves to string people out along a single dimension.

"The ball-park guess (page 69) may underestimate the number who continue education beyond high school. Are there figures that can be cited? But whether there are or aren't, the basic argument is equally valid, for the issue is recognition, reward, and respect."

Pearson: "I've been reasonably expansive in thinking about new College Board programs, but this proposal seems to me to be outside the Board's mission and capabilities."

Prentice: "I strongly sympathize with the aims of this proposal, but I hope it will be developed conservatively and step by step. I can only partially endorse the second and third recommendations. The testing of readiness for admission to post-high school vocational education is a highly appropriate College Board development, but I am less sanguine about 'job entry testing,' which is incredibly diverse and would require untold research before it led to suitable social gains."

Schlossberg: "I agree completely with Marland's analysis. My disagreement is with his proposed solution. I do not feel that wholesale testing will change testing from 'gate-keeping' to 'gate-opening.' I am sorry to disagree, but I just can't support the expansion of testing."

Shirley: "Recommendation 1: Experimentation on a broad scale should be a purpose of the Board. And if there is to be any symmetry, more than one avenue toward a satisfying life should be offered the student. This may well be a function of guidance, rather than testing, but certainly the feasibility of testing should be explored.

"Recommendations 2 and 3: It is certainly fitting for the Board, in the interest of symmetry, to run such a pilot program on job entry. But this should be a research pilot program only. If such research shows need for a national effort, and if the research shows tests to be a feasible way of solving this problem, the operations should be taken over by some other national agent, since this program goes far beyond the scope or ability of the present organization."

Thresher: "I support this proposal, at least in principle. The scale is so immense that it may well be that we cannot look, at present, much beyond a pilot program. Both this brief and that of Schlossberg, Hoy, and Gordon are of a character and scope to shake the Board out of its somewhat complacent servicing of the conventional academic establishment."

A Program for Providing Information about Colleges to Applicants

C. Robert Pace

Granted the virtue of a greater symmetry of information between applicant and institution in the process of deciding who goes where to college, the College Entrance Examination Board will need to develop a program for doing this that is relevant, feasible, and impartial. Specifically, what information about the institution is relevant? How is relevance determined? How is impartiality assured? How is validity judged? And what is feasible? These questions cannot be wisely answered overnight. They require systematic, scholarly, and imaginative consideration. The consequences of the inventions and answers that are arrived at may be as significant as the consequences have been of previous inventions of measures of scholastic aptitude and achievement and grade-point averages.

The purpose of this brief is threefold: (1) to recommend that the College Board support a research and development program along with the earliest possible introduction of a mutual information exchange system between applicants and Board member colleges; (2) to suggest something of the content and complexity of such a research and development program; and (3) to suggest possible forms that an information system might take.

Estimating the Dimensions of the Problem

Realistically, I assume that the College Board is concerned with providing information about Board member colleges to the applicants to those colleges. Idealistically, I assume that the Board is concerned with a potentially nationwide program without regard to what institutions belong to what organizations—at least that would be true if the Board accepted the student as its potential client just as it now accepts the college as its actual client.

Accepting the student as a client, however, does not necessarily mean that the Board would be dealing with several million high school graduates in relation to more than 2,000 colleges and universities in some mutual information exchange system. The

question "Who goes where to college?" can be answered; but the question of how much choice is involved in this distribution of students to colleges cannot be answered with quite the same assurance. For many students no choice (realistically) is open. "The opportunity for students to choose where they will go depends on several conditions: on what is available near at hand, on knowledge of what is available elsewhere, and on the students' talents and financial resources. The combined possession of high academic talents, money, and scholarships will enable some students to make national choices among the best public and private institutions. . . . There are selective students as well as selective institutions. . . . For most students going to college, however, the choices open to them will be more limited, based mainly, as they are now, on the circumstances that the place is near and the price is right. . . . Any national effort toward selective assignment, which told people where to go and what was good for them, would be contrary to our deepest traditions of freedom and morality. Distinctive institutions and distinctive individuals will just have to find one another, as they often do now; and they will be more likely to do so as information about each becomes more available to both, and as the resources which permit mobility are increased. . . ."[1]

The point of these comments is simply that how one defines the magnitude of the problem will have a bearing on what kind of information about colleges is really relevant and useful for the applicants. If the clientele is limited to the students who can afford to be nationally selective, then it is important and useful to make subtle distinctions between Harvard, Yale, and Princeton. But if the clientele is larger and more heterogeneous, then such distinctions are of minor utility; whereas differences between those institutions and, for example, the University of

1. Pace, C. Robert, "Selective Higher Education for Diverse Students," in Earl J. McGrath, ed., *Universal Higher Education*. New York: McGraw-Hill Book Co., 1966, pp. 160–170.

Northern Iowa, Ouachita Baptist College, and Eastern Oregon State College are more important. The content of the information system will depend on the kind of discrimination the system is designed to facilitate. One needs to face this policy issue before one can realistically consider the question of what information will be useful to the applicants.

Examining the Information That is Available from Open Sources and Published Instruments

A very substantial literature has accumulated, especially over the past dozen years, that has a bearing on the characteristics of college environments. Basically, researchers have used one or more of five rather different approaches in describing college environments.

1. Colleges have been characterized by the kind of people who go to them. California Institute of Technology can be characterized as a place in which all students have scores of 700 or higher on the mathematical sections of the College Board's Scholastic Aptitude Test (SAT). The *College Handbook*, published by the Board, provides information of this type—SAT scores, high school class rank, and so forth of applicants and enrolled freshmen. Bennington can be characterized as a place where 80 percent of the entering students have traveled abroad, whereas at the University of South Dakota perhaps no more than 5 percent of the entering students have traveled abroad (this is a guess, not a known fact). Educational Testing Service's College Student Questionnaire (CSQ) is used in several hundred institutions. From the CSQ one can characterize the student body according to educational and vocational plans, family independence, peer independence, liberalism, social conscience, cultural sophistication, and with respect to value orientations described as academic, collegiate, vocational, and nonconformist. Another widely used test is the Omnibus Personality Inventory (OPI). From the OPI one can characterize student bodies along such di-

mensions as thinking introversion, theoretical orientation, estheticism, complexity, autonomy, religious orientation, social orientation, impulse expression, personal integration, anxiety level, altruism, practical outlook, and masculinity-femininity. The Stern Activities Index and the Edwards Personal Preference Inventory describe students, and student bodies, with respect to the strength of various personality needs such as needs for understanding, affiliation, dominance, deference, order, and so forth. The Allport-Vernon-Lindzey Study of Values assesses the relative priority of theoretical, esthetic, social, religious, political, and economic values. From John L. Holland's Vocational Preference Inventory, and from other such tests, one can describe student bodies with respect to a variety of occupational orientations and interests. Conservatively, considering only the most widely used measures, I would estimate that they contain about 2,000 more or less different items and produce about 100 more or less different variables or measures along which one could characterize and compare the student bodies of different colleges and universities.

2. Colleges have been characterized by their programs. One does not go to Sweet Briar to study engineering nor to South Dakota School of Mines to study music. The catalog is the basic source for this type of information. But the catalog is not enough. What is also relevant to the atmosphere of the institution is the proportion of students in different fields. A college in which 40 percent of the students are in engineering is quite different from one in which 40 percent of the students are in education.

3. Colleges have been characterized along various census or demographic variables. Again, many of these are common and familiar—such as size, form of control, for men, women, or both, highest degree offered, rural or urban, residential or commuter, and so on. Alexander W. Astin has grouped information of this kind into five general dimensions that he calls affluence, size, masculinity, homogeneity of offerings, and technical em-

phasis. These overlap somewhat with what I have classified as program variables. There are others that may be important, such as class size, ratio of undergraduate to graduate students, ratio of part-time to full-time students, and so on.

4. Colleges have been classified by how students behave in them. The Educational Testing Service (ETS) surveys, by Richard E. Peterson, of the incidence of organized student protest are an example of this approach. Astin, in some of his research for the American Council on Education, has been following a similar line, asking, for example, how many students report that they have had a blind date, have drunk beer, slept in class, argued with a professor, and so forth. From factor analysis of information of this kind Astin develops indexes for characterizing the peer environment, the classroom environment, and the administrative environment.

5. Colleges have been characterized by what the students who attend them perceive to be generally true about them. This collective perception or consensus approach is typified by the College Characteristics Index, the College & University Environment Scales (CUES), by similar scales developed by Donald L. Thistlethwaite, by some of the semantic differential scales developed by Lawrence A. Pervin, and by similar but much less widely used sets of items that other investigators have tried out. The College Characteristics Index, originally developed by Pace and George G. Stern and now used exclusively by Stern, produces measures described as intellectual climate, vocational climate, aspiration level, student dignity, self-expression, group life, and social form. One of these, intellectual climate, is parallel to various intellectual needs measured by Stern's Activities Index. The other environmental press scales are not parallel, or at best are only slightly parallel, to corresponding needs scales in the Activities Index. Pace's CUES, distributed by ETS, produces characterizations of the environment along dimensions labeled scholarship, awareness, community, propriety, and practicality. In the new second edition there are additional scales labeled

campus morale, and quality of teaching and faculty-student relations. Thistlethwaite's instrument is divided into 12 faculty-press scales and 11 student-press scales, with titles such as faculty press for vocationalism, faculty press for advanced training, faculty press for affiliation, faculty press for independent thinking, student press for academic achievement, student press for esthetic-ism, student press for opposition to faculty influence, student press for reflectiveness, and so on. Astin has also developed some "college image" items, which produce factors labeled academic competitiveness, concern for the individual student, school spirit, permissiveness, snobbishness, emphasis on esthetics, flexibility of the curriculum, and emphasis on social life. Pervin's semantic differential scales include 52 concepts, which can be collapsed into 13 factors having such labels as impulsivity-inhibition, lib-eral idealism-conservative pragmatism, optimism-alienation, and cosmopolitan-provincial. Altogether, in the most widely used consensus or perceptual measures there are probably about 1,000 more or less different items, which in various combinations produce some 20 to 50 more or less different scales or variables.

In a nationwide study of college students, alumni, and en-vironments that we are currently conducting at the University of California, Los Angeles, we are searching for some reasonably parsimonious set of environmental characteristics that have a bearing on what happens to students. In the process of doing this we are trying out some new measures of such characteristics as learning styles, peer-group patterns, discipline and freedom, and so forth; and we are deriving various indexes for such possibly useful variables as institutional diversity, teaching orientation, involvement in campus life, and cosmopolitanism of student body.

There is a vast amount of published information, and data from test responses, that should be carefully examined. It is quite probable that the essence of this information can be reported in a relatively small number of crucial variables. But no such effort at data reduction has yet been attempted. The reason for some

optimism that it can be done comes from the fact that, despite differences in method and content, different methods do not produce conflicting (negatively related) results; and even with some variations in content, certain variables continually emerge. Overall, there is a set of positive intercorrelations among different data sources that "should" be related, which range generally from the .30's to the .60's. Admittedly these are not "high" correlations, but they are about as large as are the typical correlations between SAT scores and college grades.

Collecting Judgments from Potential Users and Contributors

It would not be sufficient to base an information exchange system solely on the results of some data-reduction process applied to the thousands of pieces of potentially useful and available information. The ultimate selection of what information is made available, and in what form, should also be guided by the expressed desires and suggestions of the potential consumers (applicants, parents, and counselors) and the judgments of those who would have to provide some of the information (current college students and college officials).

From high school students, parents, and counselors one needs to find out (or be assured that he knows) what they really want to know, what things they consider or would want to consider in making a choice among colleges. It will probably be discovered that some of their questions cannot be answered—questions like "Will the credits be accepted by another institution?" which can only be answered by the "other" institution. Or "What percent of the students smoke marijuana?" (Who knows? Is it legitimate public information?) Some questions that can be answered are probably of interest to a great many people; others may be of interest to very few people. A series of interviews and group discussions can help to identify and give some perspective to these consumer concerns. Structured and unstructured questionnaires, both for high school students and for parents, could

be distributed at regional test centers. In the structured questionnaires one could present various types of information and ask for some ratings of their relative importance; in the unstructured case, one could simply ask what sort of information they seek or think would be most helpful to them. Some studies of this kind have been made; but new studies are needed because the relevant questions and concerns today may not be the same as those reported by researchers 5 or 10 years ago.

Similarly, from college students and college officials (faculty and administration) one needs to learn what it is about the college that they think prospective students should know—that is, if someone is interested in coming to this place, what are some of the things he ought to know about it. Again, interviews, group discussions, and answers to structured and unstructured questionnaires would be important sources of information.

All this is not to say that consumer surveys should determine what information is put into the system; but it is to say that the questions that researchers ask and that result in assorted scores and indexes are not necessarily the same as the questions of most relevance to consumers. The inquiries and insights of both are important, so that the system produces answers people want, and also answers they need regardless of their awareness of the need.

Developing Guides for Decisions about the System

At the beginning of this brief, I used the words "relevant, feasible, impartial . . . and valid." Information about the college should make sense theoretically, educationally, and practically. By theoretical sense I mean that it cannot be a miscellaneous assortment of data that some people think might be useful, nor a presentation of vast amounts of unstructured data. There need to be guiding principles for selecting and grouping information. By educational sense I mean that the information should be relevant to institutional purposes and to the larger purposes of personal development and enrichment. By practical sense I mean that the

information must be usable and interpretable by the people for whom it is intended. The result of a research and development program should be a system that makes sense in all these ways.

Moreover, information in the system must be defensible in the sense of fairness and impartiality and reliability. If opinions or collective judgments are part of the system they must be based on honestly selected cross sections of reporters. If characteristics of the student body are part of the system they must be based on reliable and sytematically applied measures. If various pieces of information are combined to produce a score or index, then the psychometric properties of the score nust be known. If typologies or broad classifications are part of the system, then there must be statistical support for them.

Operating the System in Successive Stages

One need not await the results of extensive research before putting parts of a system into operation.

The computer systems that enable applicants to identify colleges having various characteristics (such as their location, size, programs, scholarships, and so on) can be adopted now. An interactive system, such as the one David V. Tiedeman has constructed, might be the recommended model for expanded application. Presumably the content or software that can be put into the system initially would be limited to public information obtained from catalogs, directories, and other documents. In fact, initially, as John Hersey suggests in his brief to the Commission on Tests (page 51), the software may have to be in printed form until the computer hardware is available. In any case, the public information—of the sort suggested in briefs to the Commission on Tests by Coleman (page 19) and Hersey (page 51)—can be "interpreted" so that applicants will be helped to understand what it means. These interpretations can be based on present research knowledge, including at least some comparative information about the range of differences that exist among institutions of different types.

While this initial information is being prepared for the system, a second stage of research can be started. I conceive this stage as being the consumers' and producers' surveys that have been previously suggested. They would be intended to provide guidance for further amplification of both the student and college input.

A third stage of the research, which can begin whenever the first two stages begin, but which will take somewhat longer to complete, is that of examining the vast range of variables, items, and scores currently in existence, for the purpose of arriving at a more compact and manageable set of variables about student bodies and college environments to use in the final system. This kind of information, psychological and educational, will ultimately give a more meaningful base for mutual choices.

One needs to recognize that it may not be possible, or if possible may not be desirable, to envision a system that says to a student "These six colleges will be best for you" or to a college that "These students will be most compatible with your institutional environment." Whether continuity and homogeneity or whether change and diversity are more productive of personal growth and development and of institutional adaptability is a question to which present research offers no solid answer. The sort of "advice" one puts into a system—whether advice to applicants or to colleges—must be considered with more than a little humility, with a great deal of conservative caution, and with due respect for the possible results of research that has not yet been conducted. This does not mean that there is nothing useful one can say. Rather, it means that a combination of frankness and humility is precisely what ought to distinguish the College Board's program from the programs of commercial or less professional agencies.

The fact that college applicants are required to submit a good deal of information about themselves—answers to questions on an application form, scores on standardized tests of ability and achievement, and a record of high school courses and grades—

has had major educational, personal, and societal consequences. It was partly an awareness of these consequences that led to the creation of the Commission on Tests. If, now, the College Board develops a system of information about colleges—parallel in intent and comparable in scope to what colleges require to know about applicants—it is reasonably certain that the result will also have major educational, personal, and societal consequences.

Recommendations

It is recommended that the College Entrance Examination Board:

1. Support a research and development program to assemble, evaluate, and interpret information about colleges, taking into account the kinds of issues, sources, and technical matters described in this brief.

2. Regard this program as contributing, in stages, to the necessary software underlying a computerized information system.

3. Present information developed from the program in some printed form to be determined by the College Board, pending its incorporation into a computerized system, so that as much as possible will be available to applicants at the earliest feasible time.

Record of Endorsement, Comment, Reservation, and Dissent on the Recommendations in *A Program for Providing Information about Colleges to Applicants*

It is recommended that the College Entrance Examination Board:

1. Support a research and development program to assemble, evaluate, and interpret information about colleges, taking into

account the kinds of issues, sources, and technical matters described in this brief.

Endorsed by 20 members: Abelson, Blocker, Carroll, Coleman, Cross, Foster, Friedenberg, Gordon, Hechinger, Hersey, Holtzman, Hoy, Marland, Pace, Pearson, Prentice, Schlossberg, Shirley, Thresher, Tiedeman.

2. Regard this program as contributing, in stages, to the necessary software underlying a computerized information system.

Endorsed by 20 members: Abelson, Blocker, Carroll, Coleman, Cross, Foster, Friedenberg, Gordon, Hechinger, Hersey, Holtzman, Hoy, Marland, Pace, Pearson, Prentice, Schlossberg, Shirley, Thresher, Tiedeman.

Foster: "If it becomes possible."

3. Present information developed from the program in some printed form to be determined by the College Board, pending its incorporation into a computerized system, so that as much as possible will be available to applicants at the earliest feasible time.

Endorsed by 20 members: Abelson, Blocker, Carroll, Coleman, Cross, Foster, Friedenberg, Gordon, Hechinger, Hersey, Holtzman, Hoy, Marland, Pace, Pearson, Prentice, Schlossberg, Shirley, Thresher, Tiedeman.

General Comments

Hersey: "I strongly support these recommendations. I am troubled, however, by the thrust of the passage in paragraph four (page 88). The fact that real choices are at present available to only a few students seems in the quoted passage to be accepted as not only the way things are but also the way they have to be ('Distinctive institutions and distinctive individuals will just have to find one another. . . .'). It seems to me that the task before the

College Board is to provide *every* student choices of at least the magnitude of those every college now has. There is an important difference between telling students 'where to go and what is good for them' and telling each student where he may be able to find what he wants and giving him as many clues as possible to what may be realistic for him to want. (This distinction ought to apply also to the last paragraph on page 96. What I'd hope the Board would say to the student is, 'If you haven't already, you'll probably want to look into these six—or eight or ten—colleges, because they offer, in varying degrees and ways, which we'll try to specify for you, things you appear to us to want or need.' And so on.) As to the paragraph following the quoted passage, I doubt if there can be a generalized rank order of distinctions between various categories of institutions; to the individual student one sort may be more important than another, and it would be precisely the task of an information system to point each student toward the distinctions that matter to him."

Shirley: "This is certainly the kind of information that needs to be researched before implementing a program of disseminating information about colleges. We must be sure symmetry is possible and at least partially realistic. I would suggest, however, that the College Board might still be of assistance in getting support for such an effort, without taking on the full expense of what is likely to be a more demanding program than its present resources or membership institutions would support. But foundation support should be sought to get these early steps done in preparation for implementation of a reasonable program to obtain symmetry."

Thresher: "I could hope for more detail on the problem of the large, complex institution."

Education and Testing in a Period of Qualitative Change

Richard Pearson

The tests used in American education are viewed in different ways by different people. A teacher look on tests as an instructional aid. A counselor expects tests to give him some insight into the promise that a young individual may have for some future endeavor. An admissions officer counts on tests to help him constitute an incoming class. A psychologist uses tests in experimental situations to validate hypotheses and to erect theoretical structures. A company that sells tests looks on them as a product with market potential and financial value. And the student who takes tests sometimes sees them as suggesting opportunities but increasingly often looks upon them as barriers that may or may not be overcome.

Taking a broader perspective, tests can also be viewed as instruments of educational and public policy. Their large-scale use at schools, colleges, and universities has important long-term effects on the size and composition of the student population, on student movement through the educational system, and on the substance of the educational process. Further, to the extent that education is also a public enterprise in the United States, the tests used in education are also instruments of public policy that help determine what students will be educated in what programs for what future roles in American society.

This paper is concerned with tests as instruments of educational and public policy. More specifically it is concerned with the College Entrance Examination Board's policy objectives in testing during the period of qualitative change that lies ahead during the 1970s.

Today, higher education in the United States is facing great pressures for qualitative change. Student unrest on the campuses has directed the attention of faculty and administrators to the substance of education in the undergraduate programs. Militant black students are, on the one hand, asking colleges to admit young people who would not have been considered for college admission a decade ago. On the other hand, these same militant young blacks are asking college faculties to offer courses and

programs in black studies for which much of the basic underlying scholarship has yet to be done. The Carnegie Commission on Higher Education is examining the functions, structure, organization, and financing of the various institutions of higher education. In considering these various sources of pressure for qualitative change, Lewis B. Mayhew concludes, "It becomes necessary, then, only to anticipate whether the changes will have been evolutionary and deriving from present practice, or revolutionary to an extent that the entire character of undergraduate education will have been altered."[1]

Some sense of the *qualitative* nature of the impending changes is given by Abraham H. Maslow writing about the development of a "Third Force" psychology within that discipline. Maslow writes as follows: "The upshot of the past decade or two of turmoil and change within the field of psychology can be viewed as a local manifestation of a great change taking place in all fields of knowledge. We are witnessing a great revolution in thought, in the Zeitgeist itself: the creation of a new image of man and society and of religion and science. It is the kind of change that happens, as Whitehead said, once or twice in a century. This is not an improvement of something; it is a real change in direction altogether. It is as if we had been going north and are now going south instead."[2]

Qualitative change will, of course, be accompanied by quantitative change in higher education as enrollment predictions continue to mount. Sidney G. Tickton projects an increase of 103 percent in college enrollments between 1965 and 1980.[3] In

1. Mayhew, Lewis B., "The Future Undergraduate Curriculum," in Alvin C. Eurich, ed., *Campus 1980, the Shape of the Future in American Higher Education.* New York: Delacorte Press, 1968, p. 202.

2. Maslow, Abraham H., "Some Educational Implications of the Humanistic Psychologies." *Harvard Educational Review*, Fall 1968, p. 685.

3. Tickton, Sidney G., "The Magnitude of American Higher Education in 1980," in Alvin C. Eurich, ed., *Campus 1980, The Shape of the Future in American Higher Education.* New York: Delacorte Press, 1968, Table C, p. 14.

response to predictions of this kind, the Carnegie Commission on Higher Education calls for the establishment of 500 new community colleges and 50 urban four-year colleges by 1976, to meet the needs of the inner cities.[4] If experimentation and qualitative change are in the air, then these new institutions may well be the places where dramatic changes will occur.

Perhaps the best balanced summary of needed change in higher education is given by John W. Gardner. Gardner's agenda has eight important items, the first two of which deal with teaching and with the undergraduate curriculum. In the latter connection he writes as follows:

"The colleges and universities are going to have to undertake a thoroughgoing reform of the undergraduate curriculum. We have now had a decade of lively reform in the high-school curriculum. A comparable movement for reform at the college level is already under way, and we shall be hearing a great deal more about it in the years ahead. It is certain to transform instruction in all major fields of knowledge. It will require searching reappraisal of the aims of education in each field. It will require thorough exploration of the possibilities of new teaching aids and methods. It will involve a more widespread and ingenious use of independent study. And it must involve a continuing effort to do justice to interdisciplinary approaches. Curriculum reform will be incomplete if its only consequence is that each specific subject is better taught; it must also reintroduce into the undergraduate program the breadth so essential for young people who will reach the peak of their careers in the twenty-first century."[5]

These various expectations for qualitative change in higher

4. Carnegie Commission on Higher Education, *Quality and Equality: New Levels of Federal Responsibility for Higher Education*. New York: McGraw-Hill, Dec. 1968, p. 37.

5. Gardner, John W., "Agenda for the Colleges and Universities," in Alvin C. Eurich, ed., *Campus 1980, The Shape of the Future in American Higher Education*. New York: Delacorte Press, 1968, p. 2.

education present the College Board with at least three important implications for its testing function. First, college programs can be expected to call for increasingly sophisticated abilities on the part of students. A decade of strong preparation for college in the country's outstanding secondary schools has advanced the level of performance of beginning college students on the competitive campuses to a level one to two years beyond the students of an earlier day. Independent study and major research papers are now an aspect of the secondary school curriculum and result in the development of skills that were formerly developed only in college. This calls for greater sophistication and greater flexibility in the Board's tests that will be used in conjunction with competitive admission. Second, educational programs at the college level can be expected to increase greatly in variety and diversity. The current emphasis on urban colleges and universities will undoubtedly give great impetus to the organization of new educational programs in the health sciences, social services, urban education, and other fields that are related to improving the quality of life in urban areas. Traditional academic subjects in secondary school will be replaced at least in part by preparatory courses for these newer fields. Third, as has been made clear on many campuses and in many high schools, students will expect to participate more directly in the decisions that affect them and their future. In order to participate, they will need sound, scientifically based information while they are still in secondary school.

The fact of strong student interest in involvement and participation is one that the Board should respond to with all deliberate speed. The Board's testing function should be focused principally on the high school student during the middle school years and on the plans that he or she needs to make in connection with continued education beyond high school. The wisdom of this step is further supported by signs of increased maturity among young people today, the increasing specialization in many college programs, and the limited guidance resources

available in many schools. The evaluation of past educational progress and the estimation of future educational performance thus can be, as it should be, the student's own business far more than has been the case previously.

Accordingly my first recommendation is as follows:

1. The Board should adopt as its principal policy objective in testing the provision of a broad array of tests and other information designed to assist tenth- and eleventh-grade high school students in educational planning and decisions with respect to post-high school opportunities.

Acceptance of this policy objective implies a considerable extension of tests and other information beyond what is now available in the Board's programs. The high school population of the country is made up of young people whose abilities and achievements are more varied than the Board has traditionally recognized. Further, the existence of some young people in this population whose abilities have not been adequately developed in the schools requires that special provision be made for them. The suggestion by Edmund Gordon and Winton Manning for the redirection of testing efforts for disadvantaged children is indicative of the breadth that is required. They have proposed the development of tests for this population that would serve prescriptive functions—that is, tests that would help prescribe the kinds of instructional programs that would be expected to overcome particular educational deficits.[6] The need for tests predictive of performance in the vocational, technical, and subprofessional programs of the community colleges is another example of the extension required.

In connection with this first recommendation, it is important to emphasize that I am proposing broader criteria for the inclusion or exclusion of individual tests in the Board's overall program than have previously been utilized. The underlying cri-

6. Manning, Winton H., "The Measurement of Intellectual Capacity and Performance." Manuscript submitted to *The Journal of Negro Education.*

terion implied by this recommendation is the student's own interest in planning his educational career. The Board's present tests are focused largely on institutional criteria. Thus low test performance on the Scholastic Aptitude Test (SAT) constitutes a caution to the college in extending an admissions offer but is of little use to the student who needs information about the educational program he might next consider in order to develop further the abilities and interests he may have. Acceptance of a student-oriented criterion for the Board's tests also implies extending validation of the tests beyond the criterion of first-year grades in college. The use of grades as criteria for college entrance tests has traditionally been in the interests of the institutions. And, while there is some convergence between institutional interest and student interest, the student's interests in educational planning would be better served if tests were also validated against success in the careers made possible by the educational program in question. A third implication of this extension of the criterion for the Board's tests is that it is in the interests of some high school students to make comparisons between opportunities for further education and opportunities for employment immediately upon graduation from high school. Such comparisons are not greatly facilitated at the present time by the Board's exclusive interest in college admissions.

With further respect to student involvement, the amount of information available to colleges and universities about students is greater than the amount of information about the institutions that is available to prospective applicants. The scarcity and inaccuracy of information about college programs and the campus environment is a serious handicap to full student involvement in decisions about college attendance. Accordingly my second recommendation is as follows:

2. The Board should provide factual and scientifically based information about individual colleges and universities for use by prospective applicants. This information should go beyond that now routinely supplied by institutions of higher education and

should include ability and performance expectations for admission and for success in particular programs as well as information about the campus environment.

This recommendation calls for the provision of information by colleges that they are not now providing either directly or through such sources as *The College Handbook* and the *Manual of Freshman Class Profiles*. The justification for such a recommendation in this context is one of equity in the institution's dealings with the individual student in the admissions process. Justification lies more generally, however, in the area of public accountability and the responsibility of institutions of higher education to report generally in the public interest.

The institutional functions of admissions and placement at the colleges and universities require utilization of some, although perhaps not all, of the information that would be made available to high school students under recommendation 1 above. Thus the Board should make provision for the reporting of test results to the appropriate offices of the colleges and universities, on request of the individual applicants. I visualize this process operating under a series of three to five specialized reporting programs where the data required would coincide with the admissions requirements of the particular college or university. Thus a comprehensive university with a number of schools and colleges and a variety of educational programs might have different requirements from a liberal arts college. Similarly a four-year institution might have different requirements from a community college. Eventually, when computer use is more widespread and when the test information called for under Recommendation 1 can be stored in regional or local data banks, this information can be made available to the higher education institutions "on call" from the computer. Accordingly my third recommendation is as follows:

3. The Board should make provision for a series of three to five specialized reporting programs, corresponding to different types of institutions of higher education, for the provision of test

results to colleges and universities in connection with institutional decisions about admissions and placement. Further, experimentation should be undertaken with respect to computer storage and retrieval of this information so that it can be made available to the institutions at the time and in the form needed for decisions. Further, standards for protecting the privacy of students should be established so that any test information necessary for students but not appropriate for use in institutional decisions will be reported only to students.

The provision of a broad array of tests and other information for educational planning and guidance in the high schools and the further provision of reporting programs that would place relevant parts of the test results in the hands of the colleges and universities for institutional decisions should reduce redundancy in testing that exists today and should provide adequate information for both students and institutions. There may be instances, however, where this global approach may leave unmet certain institutional requirements and the requirements of certain groups of students. The relatively small number of highly competitive colleges and universities may, for example, require specialized testing for admissions decisions beyond that provided for under Recommendation 1 above. And because this recommendation is focused on students while they are in high school, there may be individuals who are prospective applicants for college admission who are not part of the high school population. For both of these reasons it may be necessary to provide specialized testing programs for limited numbers of institutions or for limited numbers of individuals. These specialized programs should be introduced only when there is clear justification for them and only when the basic program is clearly inadequate in some respect. Accordingly my fourth recommendation is as follows:

4. The Board should be prepared to offer supplementary testing programs for particular groups of colleges and universities and for prospective applicants who may not be enrolled in high school under provisions that would limit redundancy and

duplication with the basic program.

All the preceding recommendations should move the Board away from the current strong emphasis on selective admissions by institutions to a strong emphasis on educational planning and decision by students who make up a comprehensive and diverse high school population. Further, the breadth of test offerings in the basic program proposed in Recommendation 1 should support multiple channels of access to the variety of institutions that will characterize the colleges and universities of the future. It is likely, however, that the pace and timing of qualitative change among higher education institutions will be uncertain and that this uncertainty will pose continuing serious policy problems for the Board. Consequently my fifth recommendation is as follows:

5. The Board should keep the objectives proposed in this report under continuing policy review and provide adequate empirical research in connection with this continuing review in order to assess the extent and timing of the proposed changes.

In conclusion, the overall thrust of the foregoing recommendations is to place the Board's present testing activities in a flexible position, one that will make them responsive to impending qualitative change within higher education. The direction of this change is toward an inclusive system of colleges and universities with multiple channels of access—a system that will no longer exclude substantial proportions of American youth. Tests of the future must be at least as efficient in selecting young people into higher education as traditional tests have been in selecting them out.

Recommendations

It is recommended that the College Entrance Examination Board:

1. Adopt as its principal policy objective in testing the provision of a broad array of tests and other information designed to assist tenth- and eleventh-grade high school students in educa-

tional planning and decisions with respect to post-high school opportunities.

2. Provide factual and scientifically based information about individual colleges and universities for use by prospective applicants. This information should go beyond that now routinely supplied by institutions of higher education and should include ability and performance expectations for admission and for success in particular programs as well as information about the campus environment.

3. Make provision for a series of three to five specialized reporting programs, corresponding to different types of institutions of higher education, for the provision of test results to colleges and universities in connection with institutional decisions about admissions and placement. Further, experimentation should be undertaken with respect to computer storage and retrieval of this information so that it can be made available to the institutions at the time and in the form needed for decisions. Further, standards for protecting the privacy of students should be established so that any test information necessary for students but not appropriate for use in institutional decisions will be reported only to students.

4. Be prepared to offer supplementary testing programs for particular groups of colleges and universities and for prospective applicants who may not be enrolled in high school under provisions that would limit redundancy and duplication with the basic program.

5. Keep the objectives proposed in this report under continuing policy review and provide adequate empirical research in continuing review in order to assess the extent and timing of the proposed changes.

Record of Endorsement, Comment, Reservation, and Dissent on the Recommendations in *Education and Testing in a Period of Qualitative Change*

It is recommended that the College Entrance Examination Board:

1. Adopt as its principal policy objective in testing the provision of a broad array of tests and other information designed to assist tenth- and eleventh-grade high school students in educational planning and decisions with respect to post-high school opportunities.

Endorsed by 18 members: Abelson, Blocker, Carroll, Coleman, Foster, Friedenberg, Gordon, Hechinger, Hersey, Holtzman, Hoy, Marland, Pace, Pearson, Schlossberg, Shirley, Thresher, Tiedeman.

Foster: "I think it is important to change the reference to assisting 'tenth- and eleventh-grade high school students' to 'colleges and prospective students.'"

Tiedeman: "I would prefer more ambiguous words than 'tenth- and eleventh-grade.'"

Not endorsed by 1 member: Prentice.

2. Provide factual and scientifically based information about individual colleges and universities for use by prospective applicants. This information should go beyond that now routinely supplied by institutions of higher education and should include ability and performance expectations for admission and for success in particular programs as well as information about the campus environment.

Endorsed by 18 members: Abelson, Blocker, Carroll, Coleman, Foster, Friedenberg, Gordon, Hechinger, Hersey, Holtzman, Hoy,

Marland, Pace, Pearson, Schlossberg, Shirley, Thresher, Tiedeman.

Not endorsed by 1 member: Prentice.

3. Make provision for a series of three to five specialized reporting programs, corresponding to different types of institutions of higher education, for the provision of test results to colleges and universities in connection with institutional decisions about admissions and placement. Further, experimentation should be undertaken with respect to computer storage and retrieval of this information so that it can be made available to the institutions at the time and in the form needed for decisions. Further, standards for protecting the privacy of students should be established so that any test information necessary for students but not appropriate for use in institutional decisions will be reported only to students.

Endorsed by 18 members: Abelson, Blocker, Carroll, Coleman, Foster, Friedenberg, Gordon, Hechinger, Hersey, Holtzman, Hoy, Marland, Pace, Pearson, Schlossberg, Shirley, Thresher, Tiedeman.

Not endorsed by 1 member: Prentice.

4. Be prepared to offer supplementary testing programs for particular groups of colleges and universities and for prospective applicants who may not be enrolled in high school under provisions that would limit redundancy and duplication with the basic program.

Endorsed by 18 members: Abelson, Blocker, Carroll, Coleman, Foster, Friedenberg, Gordon, Hechinger, Hersey, Holtzman, Hoy, Marland, Pace, Pearson, Schlossberg, Shirley, Thresher, Tiedeman.

Thresher: "Recommendation 4 may require some vigilance to prevent the new resurgence of elitism in groups of colleges seeking special tests. This could nullify or tend to nullify Carroll's proposal to reduce redundancy in testing."

Not endorsed by 1 member: Prentice.

5. Keep the objectives proposed in this report under continuing policy review and provide adequate empirical research in continuing review in order to assess the extent and timing of the proposed changes.

Endorsed by 18 members: Abelson, Blocker, Carroll, Coleman, Foster, Friedenberg, Gordon, Hechinger, Hersey, Holtzman, Hoy, Marland, Pace, Pearson, Schlossberg, Shirley, Thresher, Tiedeman.

Not endorsed by 1 member: Prentice.

General Comments

Foster: "In speaking of 'abilities and interests [a student] may have,' we should be mindful in the discussion about relevance and student choice (and both are essential) of the once-vaunted purpose of the American college to help a student discover interests and abilities he knows not of.

"In the paragraph preceding his fifth recommendation Pearson mentions moving the Board away from the current strong emphasis on selective admissions. Change in the universities is essential and will take place. Not every one of the 100 percent of youth who should have 'higher' education will profit most by strict and strictly intellectual education, but many students and many aspects of society can. Therefore, endorsement of needed changes should not, even by omission, imply lower valuation of intellectual forms of endeavor or the desirability for some selectivity of those who can most profit from and enjoy such endeavor."

Hersey: "I support these recommendations on the assumption that they are not exclusive—for example, endorsing the third recommendation, that experimentation be undertaken with computer storage of student test results, should not exclude the possibility of computer storage of data on colleges for distribution to students."

Shirley: "I am totally sympathetic with these objectives, but I fear the cost of their implementation has *not* been studied. Who is to pay? Knowing something of the magnitude of such national programs, I am convinced that neither the students (and their parents) benefited nor the high school and college members of the College Board could possibly support such an ambitious program. I should request that the Board (a) make a proposal to a national foundation to explore in depth the costs of such a program and (b) make strong recommendations to government (the Department of Health, Education, and Welfare) to implement it on a pilot level and, as experience grows, on a national basis."

Regional Centers for Guidance in Continuing Education

Nancy K. Schlossberg, John C. Hoy, and Edmund W. Gordon

Higher education, in providing expanded opportunities, is heavily burdened by having to develop services for the enormous variety of people who need and want to be served. Whether the needs of individuals seeking post-high school opportunities or the institutions offering such opportunities are being analyzed, a persistent issue is the *process* by which an individual makes a sound and effective decision concerning his own educational development. This process affects all people, whether they are overprivileged, disadvantaged, of minority status, adults, students who want to work and study part time, or traditional students interested in a two- or four-year college program. The present pattern of procedures tends to favor and reward a student who has developed within the confines of the system and who has made no (or only a few) mistakes. Indeed, the students who find the present admissions system working to their advantage are those who have attended and seek to attend the elite schools and colleges. But even among this group criticism of the system is vociferous.

As the number and variety of interested people mount, there are more and more problems related to providing guidance services to those in the process of making sound decisions about their educational development. These problems are greatly exacerbated when guidance and decision making involve people and adults who are exceptional or who are considered "offbeat." The problem of individualized guidance or alternatives to guidance will undoubtedly increase if the present trend toward general disaffection with the education establishment continues to grow. Institutions of higher education, burdened as they are, are not likely to change rapidly enough to accommodate the thousands of individuals who, although they deplore the present system, still wish to use it—especially those who view their own unique experience and background as an asset rather than a hindrance to educational acceptability and growth.

In a very profound sense, the College Board has so far been buffered from the major assault on traditional procedure and

structure that its institutional membership has experienced over the last two years. This attack will reach the College Board in time, but it is important for the Commission on Tests to suggest deliberate steps that can be taken now to make the College Board both more relevant to the changing needs of people and to the way they view access to higher education, as well as to facilitate programs that deal with the atypical, the eccentric, the disadvantaged, the neglected, and the growing number of people who simply choose to take an idiosyncratic route to their educational goal.

Though the College Board's role is well defined and seemingly necessary to present patterns of access to higher education, the question the Commission on Tests should resolve is whether the organization's resources—both financial and human—can be used to increase the possibility of permitting and encouraging all students to have more personal initiative in the process of pursuing a wider pattern of educational goals.

During the next decade the nation will see the development of continuing- and adult-education programs that culminate in degrees, certificates of advanced study, and licensing in a variety of vocational fields. Though the College Board has in a number of peripheral ways been responsive to the evolution of open door programs, it has not assumed clear leadership in the extension of its services to people and institutions directly related to this significant shift in the structure of higher education and its affiliates. Rather, the College Board has tended to make more efficient and comprehensible the present pattern of access to higher education through emphasis on selective admissions procedures for selective institutions or those that would like to be thought selective. As such, the Board has operated as a part of the system, an arm of the establishment. As our educational systems become more complex and inclusive, there is a growing need for an advocative, protective, and supportive agency outside the established institutional structures. This agency would be directed at insuring that the best interests of the client are at

all times protected, just as agents of institutional administration have as a prime responsibility the protection of the institution's best interests in behalf of all clients. It would be based on the legal conception of the ombudsman—one who helps and even protects an individual citizen in his encounters with agents of government. The guidance agency would be the client's advocate and protector—insuring, at every point in the process of education decision making and implementation, that his best interests are served.

A major emphasis must be placed on developing new patterns of service which can be built on but ought not to be merely extensions of the present College Board programs and services. The following suggestions are primarily illustrative but should serve to make clear the emphasis sought.

1. The College Board should establish regional centers for guidance in continuing education. These centers should be established through cooperative relations and support between public and private schools, technical institutes, colleges, and community groups. However, the centers should be independent of the control of the education institutions. The initial focus would be on urban locations such as New York, Washington, Chicago, and Los Angeles.

Board leadership should be provided; however, the centers should place priority on grassroots support and should encourage local variations on the College Board program. Funding for such centers would be gathered from several sources: the College Board colleges and universities, school systems, the United States Office of Education, foundations, student or candidate fees, local taxes.

The centers would provide opportunities for field research and would offer, through cooperative arrangements with university member institutions, graduate internships in guidance and counseling. The centers would also emphasize in-service training of counselors at the secondary school and college level. In addition, non-education-based counselors or guidance special-

ists would be trained to handle primarily clients with placement rather than counseling problems.

Regional centers would receive support on the level now offered to College Board regional office programs. Direction of the new program should be fully integrated with present Board regional office activities, though they should not be subordinated to the new program.

2. The College Board should consider as potential programs for these centers:

A. Offering appraisal and advisement services. Some of the wide variety of procedures that should be available are listed below. Formal testing should be used with discretion. All assessment should be directed at the development of a qualitative description of the client's function, potential, and needs.

(1) Individual counseling. The opportunity for individuals to talk with trained counselors would be available. Working schedules would be arranged so that professionals and paraprofessionals would be free to consult with people who simply walk in ready to talk to someone. The other staff could schedule appointments for people who want to return.

(2) Group guidance. Opportunities would be provided for people to meet in groups to discuss what they want to do with their lives and how to implement their plans. The sessions would be scheduled regularly, and a client could choose to join a group, see a counselor individually, or both.

Special groups would also be scheduled and advertised. One structured group could revolve around simulation career games such as the Life Career Games developed by James S. Coleman and Saranes Boocock of the Johns Hopkins University. These games require a trained leader, and the players must meet together several times. The games enable the player to simulate life and career planning by making game decisions, seeing their consequences, and recognizing the need to plan in many areas as a basis for self-development. Other groups may vary in pattern from unstructured brainstorming or bull sessions, through a va-

riety of approaches, to guided group interaction, including formal didactic orientation sessions.

(3) Phone counseling. Many people, but especially adults, have concerns but cannot bring themselves to come to a counselor or agency. A trained person would be available at all times to talk at length on the phone. As a result of these conversations, adults might later come to the center or meet with one of the mobile teams.

(4) Browsing room for guidance resources. Bulletin boards, files, books, and films about training and educational and occupational opportunities would be accessible and attractively located. The room would be an attractive and hospitable place for members of the community to browse and think about themselves. Coming to the browsing room would not automatically mean that counseling or testing or both would result. Many people need guidance resources but not guidance counselors.

(5) Computer-assisted guidance facilities. The Information System for Vocational Decisions by David V. Tiedeman, the Educational & Career Exploration System currently under development by Donald E. Super, or some other such system might well be accessible through terminals placed in these centers.

(6) Mobile counseling teams. Mobile teams of professional and paraprofessional guidance workers and counselors would systematically visit neighborhood centers, housing projects, schools, and other social agencies and training centers. These mobile units would provide the reaching out that so many youths and adults need, especially those from the disadvantaged areas.

B. Developing a system of credit equivalency. The growing number of adult students reentering college makes it necessary to develop a credit equivalency program. For example, some faculty members of Wayne's College of Education have been meeting with officials of several poverty programs and community college representatives to work out a system of credit equiv-

alency for paraprofessionals who engage in noncredit training and then decide to pursue academic programs. The mechanics of this program are being worked out, and models from several institutions will soon be available.

C. Offering courses in guidance for credit. A series of one-credit guidance courses would be developed and offered through the departments of educational guidance and counseling and urban affairs of the institutions concerned. These courses would be unique: First, by the offer of credit and a systematic way to go about locating resources, youths and adults would be stimulated to come to the center. Second, the course would have two instructors: a member of the center's professional staff and a graduate student who had been in either Upward Bound or the Higher Education Opportunities Program. Minimal fees would be charged. The actual nature of the courses would, of course, depend on the nature of the clients. Some proposed courses would be: How to apply to college, the nature of higher education (types of colleges, admissions procedures); How to locate vocational resources (scholarships available, good technical institutes training beauticians, barbers, skilled workers, and so forth); How to study (methods of study, blocks to studying).

D. Using new training methods for staff development. Advanced doctoral students in educational counseling would run the center. This would serve as the practical experience required of most doctoral students in guidance and counseling departments. They would provide the center with "professionals in training" at all times, as well as provide high quality counselors at a minimal cost. Paraprofessionals (not people studying to be counselors, but neighborhood leaders) would be recruited and trained. One paraprofessional would serve on each mobile team as the "contact" or "intake" person. Paraprofessionals would staff the browsing room and handle phone interviewing.

E. Conducting experimentation and research. If better opportunities are to be made available to people not well served by higher and continuing education, more progress must be made

in dealing with late adolescents and adults who have educational deficiencies or learning problems. Colleges and post-high school training institutions have moved too slowly toward a solution, and there is a critical need for some agency to assume responsibility for research in this area The regional centers might well institute experimental programs intended to assure success in continuing education for a randomly selected group of high-risk candidates. This aspect of the program should be concerned not only with remedial education, but also with correction of learning disabilities, circumvention of educational handicaps, attitudinal and motivational rehabilitation, and modified conditions of learning, as well as changed outcomes for learning. The program would be experimental because, even though several existing programs—such as the Job Corps, Mobilization for Youth, Upward Bound, and collegiate programs for disadvantaged youngsters—have dealt with aspects of the problem, none have been all-encompassing or highly successful. The College Board centers should take on the more basic problem of the feasibility of changing achievement and productivity patterns of young adults whom society has either inadequately served or damaged.

3. The College Board should incorporate student participation into the regional centers and into the Board's national program. As beneficiaries of the program, students would obviously participate in it. In addition, secondary school and college students could be employed at a regional center part-time, could serve in internship roles during the summer, and might receive undergraduate and graduate credit at the institutions that cooperate in the respective regional groups. Students should also be active in the governance of these centers. Provision must be made for them to be represented on policy boards and, if possible, to participate in the administration of programs.

4. The College Board should change its name and function to "Continuing Education Entrance Board." This implies that the focus would be to assist everyone in getting into the educa-

tional vocational opportunity structure.

Over the next decade significant steps should be taken to broaden the Board's constituency to include the wide variety of institutions concerned with post-high school development as well as a constituency of self-directed continuing-education students.

It seems abundantly apparent that the Commission on Tests is substantially behind the notion of developing symmetry in the college selection process. Field centers will be a necessary part of any such development. These recommendations are made so that such activity may begin without delay. By utilizing present and contemplated Board programs as the base for more direct contact with a wide cross section of candidates, counselors, and the general public, an imaginative and pace-setting operation should be possible. In turn, such an enterprise should prove to be an excellent vehicle for future developments in client-oriented programs related to other recommendations of the Commission.

Recommendations

It is recommended that the College Entrance Examination Board:

1. Establish regional centers for guidance in continuing education.

2. Consider as potential programs for these centers:

a. Offering appraisal and advisement services,

b. Developing a system of credit equivalency,

c. Offering courses in guidance for credit,

d. Using new training methods for staff development,

e. Conducting experimentation and research.

3. Incorporate student participation into the regional centers and into the Board's national program.

4. Change its name and function to "Continuing Education Entrance Board."

Nancy K. Schlossberg, John C. Hoy, and Edmund W. Gordon

Record of Endorsement, Comment, Reservation, and Dissent on the Recommendations in *Regional Centers for Guidance in Continuing Education*

It is recommended that the College Entrance Examination Board:

1. Establish regional centers for guidance in continuing education.

Endorsed by 17 members: Abelson, Blocker, Carroll, Coleman, Foster, Friedenberg, Gordon, Holtzman, Hoy, Marland, Pace, Pearson, Prentice, Schlossberg, Shirley, Thresher, Tiedeman.

Pace: "For one or two pilot demonstrations."

Not endorsed by 1 member: Hersey.

2. Consider as potential programs for these centers: (a) offering appraisal and advisement services, (b) developing a system of credit equivalency, (c) offering courses in guidance for credit, (d) using new training methods for staff development, and, (e) conducting experimentation and research.

Endorsed by 16 members: Abelson, Blocker, Carroll, Coleman, Foster, Friedenberg, Gordon, Holtzman, Hoy, Marland, Pace, Pearson, Schlossberg, Shirley, Thresher, Tiedeman.

Pace: "Most of these services require a fairly complex and imaginative organization, and their success may depend as much on community, political, and economic factors and so forth as on educational ones."

Not endorsed by 2 members: Hersey, Prentice.

Prentice: "Of the potential programs, I endorse only experimentation and research."

3. Incorporate student participation into the regional centers and into the Board's national program.

Endorsed by 15 members: Abelson, Blocker, Carroll, Coleman, Foster, Friedenberg, Gordon, Holtzman, Hoy, Marland, Pace, Pearson, Schlossberg, Thresher, Tiedeman.

Not endorsed by 3 members: Hersey, Prentice, Shirley.

4. Change its name and function to "Continuing Education Entrance Board."

Endorsed by 9 members: Abelson, Blocker, Foster, Gordon, Hoy, Marland, Schlossberg, Thresher, Tiedeman.

Thresher: "There might be troublesome problems if the present name were abandoned and left in the public domain. Perhaps it should be retained as a subsidiary."

Not endorsed by 8 members: Carroll, Coleman, Friedenberg, Hersey, Holtzman, Pearson, Prentice, Shirley.

Holtzman: "I would rather not seek a name change until some of the above new activities have been tested in the field, validated as to worth, and expanded operationally. Eventually such a name would be a good idea."

Pearson: "I agree with the desirability of a name change, but I'm not sure this is it."

1 member abstained: Pace.

General Comments

Abelson: "This brief, as well as the brief by Hersey ('A College Entrance Service') appears to me to include laudable objectives. However, when looked at in total, implementation of all these proposals by the College Board does not seem feasible. The costs would be too great. If these recommendations are to amount to more than rhetoric, further steps would be necessary. Either there must be a proposal for a large-scale federal subsidy or the Board should arrange a scale of priorities. In view of emerging patterns of government interference with education, I would be against proposing federal subsidy."

Carroll: "As with some of the other briefs, I endorse these recommendations only to indicate that some of them represent worthy goals, but I urge caution in view of the problems of financing and staffing."

Hersey: "As with Marland's brief, I endorse without reservation the authors' theses and their statement of the urgent need for the services described, but I feel that the College Board will have its hands full to effect the symmetry we have discussed in its role of facilitating entrance to higher education. It would be valuable, of course, to have the Commission endorse and support the proposal and recommend that others take up the task."

Holtzman: "In this proposal testing is slighted to a greater degree than it needs to be."

Marland: "Since this proposition calls for a very large change in procedures and a very complex structure, it is suggested that a prototype or two be developed for trial purposes before attempting a full-blown program."

Prentice: "I am troubled to find that the authors (all broadly experienced in educational guidance and assessment) can recommend a program that strikes me as totally unrealistic. I would estimate that the cost of the program proposed would be on the order of 100 to 1,000 times the present budget of the College Board, and the benefits would be only speculatively related to costs. I seriously doubt that enough 'advanced doctoral candidates in educational counseling' exist to supply more than token regional centers—or token service in ones that might be established. I urge that a more limited and more practical proposal be substituted for this one, with more thought being given to cost-benefit ratios and realistic sources of funds."

Shirley: "Recommendation 2: There should be no firm or major commitment until (1) success of efforts, and (2) potential funding, are assured. There are signs that the mood is rejection of, rather than acceptance into, the society by way of education."

Diversification in Educational Assessment

B. Alden Thresher

It is unrealistic to propose that the College Entrance Examination Board should simply cease testing for college admission, or even abruptly change its present procedures. The Board should rather start by taking seriously the shortcomings of the existing mode of testing, make a major project of developing alternative approaches, and be prepared gradually to reduce the almost exclusive reliance on present testing modes and conventions. Gradualness will be enforced by the conservatism of the Board member colleges, even though the Board does its best to speed up the pace. Above all, both the College Board and Educational Testing Service should maintain an experimental, innovative attitude toward the entire area of testing and the educational issues connected with it. Perhaps the greatest danger is the temptation to focus exclusively on testing as the central problem area. It would seem that in reality the major problem areas are the admissions policies of the member colleges and their curriculums and methods of instruction. To focus on tests in isolation, without regard to these two areas, would seem to offer little hope of improvement.

The central theme of the Commission on Tests' discussions, and the one that seems most nearly to command full agreement of the Commission members, is the principle of "symmetry"—the mutual availability of relevant information to all parties in a system of reciprocal selection. The choice among colleges by students, and the choice among applicants by colleges constitute such a system. In economic terms this is a market situation; the market will be more nearly perfect, and the benefit of the transaction to all parties maximized if the fullest possible information bearing upon choices is made available.

This central theme is developed in briefs by other members of the Commission. My purpose in this one is to point out why I believe the existing test mode to be less than satisfactory in the context of admission to continuing education, and why other approaches to the problem of assessment should be developed. In a separate brief, I have described in some detail one such alterna-

tive mode: self-scored and self-administered tests (pages 146–160). The present brief will have fulfilled some of its purpose if it can help to introduce into the minds of educators and of the public the realization that there can be many other ways of carrying out the broad function of educational assessment besides the current almost universal employment of adversarial, normative, psychometrically oriented, mass-administered, secure, speeded, multiple-choice, pencil-and-paper tests.

Such tests, now in wide use in this country, have proved to be a useful device during a particular state of the nation's educational development. I do not condemn them out of hand, categorically, as do some critics. But I see aspects of the testing structure that seem not to fit the problems of the present and the visible future. I see great danger in complacently continuing the existing system and defending it uncritically. I see, in particular, ways in which the general ambiance of the testing process, including the ways in which colleges utilize tests in their admissions processes, works harm to the student in the sensitive aspects of his own self-confidence, sense of identity, and the energy of spirit without which the cognitive aspects of learning become shriveled and lifeless. The Board ought to be profiting from criticism and exploring possible improvements on a wide front.

It is obvious that the structure of tests and the practices of testing constitute a prime example of the general sociological principle that a new technology, innocently devised to meet a felt need, may, because of its very convenience and utility, become an uncomfortably rigid mold that comes to constrain and limit the people whose convenience it was designed to serve. The automobile is of course the prime example of a technical device that, because of its obvious utility, has spread enormously. Not only has it disrupted cities, but it has developed secondary and tertiary ill effects that at the outset seemed negligible. Among them are accidents, air pollution, noise, and congestion. In much the same way the apparent utility and convenience of testing in

the current mode brings serious consequences as this style becomes so widespread as to dominate curriculums and teaching methods, and to distort students' concepts of the structure of knowledge and the nature of intellectual achievement.

The automobile, like the standardized test, took its origin from a simple technical innovation developed in Europe around the turn of the century. Both devices owe their luxuriant growth more to the American genius for mass production and marketing than to any notable originality exhibited in their development since they reached these shores. The automobile has been characterized as an engineering success but a scientific failure. Something of the same dichotomy of attributes is manifest in the standardized test. Granted the initial premises on which it is based, its development is a triumph of logical and mathematical perfection. But not enough is known about the learning process, the structure of knowledge, or the nature of cognition to support any confidence that the testing process yields more than a superficial, empirical body of data.

The psychometric basis of testing seems to erect a formidable structure of mathematical logic on a foundation of psychological assumptions that are of uncertain validity. The logic is irrefutable, but little is known about the underlying psychology. I am not convinced that we have got fully to the bottom of the philosophical question of what we are measuring. A number of critics have pointed out that current tests measure not what the student knows but what he does not know. But since what each of us does not know is for practical purposes infinite in extent, testing practice presupposes a theory of cognition based on the assumption that there exists a limited, definable corpus of "knowledge." Even tests carefully designed to measure intellectual skills rather than factual knowledge (and the Board has increased the proportion of these) presuppose a similar limitation. They simply identify gaps in a structure of "knowledge" made up of facts, theories, habits, attitudes, and systems of symbols. Many critics are disturbed at this situation, considering how much some stu-

dents know and can do beyond the predetermined corpus of knowledge. One wonders how much of the corpus itself is really essential, seeing how much is being dropped out of it as well as added to it year by year, and how arbitrary much of the content is. Old curriculums quickly begin to look quaint, and outmoded, and today's students readily adapt themselves to the world around them without the armament of "essential knowledge" held indispensable only a few years ago. Beyond very elementary common learnings the concept looks increasingly dubious.

We in education have already learned to cringe when people talk about "intelligence tests." One wonders whether a cultural anthropologist would not cringe even more at our easy use of the term "aptitude." He might marvel at our arrogance in assigning any normative or absolute value to the symbol systems of a particular culture and its traditional habits of thought. This is not a fanciful idea, but a pressing practical problem. Large minority groups have rich, well-established cultures of their own —cultures with a high survival value in coping with difficult environments. We have to ask ourselves whether it is not we in the academic world who are "culturally deprived." If higher education could and would reach inside these cultures and understand them there might be less arrogant insistence that others must come the whole way toward particular "correct" habits of thought.

Not only contemporary test theory, but contemporary higher learning in general leaves little scope for Josh Billings' insight that "we are all ignorant, but of different things." The academic world tends to say "If anything's known, we know it, and what we don't know isn't knowledge."

Knowing as little as we do about the structure of knowledge and the very nature of cognition, we are entitled to be very skeptical about scores derived by psychometric methods. It is certain that we need to know much more about the deep linkages between cognitive processes and the emotional life of the individual before we can use such numbers with any confidence. The

bedrock reliance of psychometry upon validity studies is put in doubt if the criterion against which validation is carried out is itself dubious. This would be the case if the criterion turns out to be formal, traditional, arbitrary, or irrelevant, or involves a circular reasoning process because it resembles the test itself.

So we need to take seriously the increasing chorus of public criticism about tests and testing. It is true that part of the conflict represents power struggles about which groups shall control testing, rather than issues of educational philosophy; some of the critics are intemperate and extreme; some are far from disinterested and have been accused of making a career of criticism; and some blame tests for abuses more properly traceable to the misuse of tests, and to a misunderstanding of their nature and purpose. Yet the question persists whether a device that can be so badly misused and so widely misunderstood is really as good as it ought to be. In any event, the Board cannot afford to take a merely defensive posture, or content itself with simply pointing out the flaws in the critics' arguments.

The younger generation frequently perceives education as irrelevant, threatening, manipulative, and coercive. There is reason to believe that testing, as actually carried on, particularly in the context of admission to higher education, contributes to this impression. Essential to the psychological health of the individual in any society is a feeling of identification, the sense of being a part of what is happening around him. This sense is best achieved when he feels he has a chance to say something about the circumstances and constraints that hedge him round, and to have that something listened to. Tests, when actually felt as a means of manipulating or coercing the individual, directly controvert this sense. Testing has developed primarily in the interests of the colleges, not of students.

Colleges and other institutions of continuing education have too easily assumed that students will docilely accept the results, and have too easily convinced themselves that whatever they themselves did was all for the good of the student. The student

feels himself the defendant in an adversary proceeding not intended to advance his interests.

So there is a growing number of attacks on normative national testing for purposes of college admission and grading. One basis of such attacks centers on the argument that there is too much emphasis on general academic ability, as judged by one or two major dimensions, and not enough attention given to specialized abilities that may also be of importance in society. Discriminatory comparisons in scholastic aptitude tests may set up a self-fulfilling prophecy; those students who do well in the aptitude tests also do well in the curriculum that is geared to the same habits of thought with which the tests concern themselves. It is common knowledge that there is a very uncertain relation between college grades and later social effectiveness in occupations other than specialized professional and scientific areas. If the curriculum itself is only partially relevant to the student's interests and objectives, and therefore provides a criterion of questionable value for test validation, screening, and selection, the resulting meritocracy becomes diverted from rational human purpose.

The entire educational system has assumed that its built-in academic standards are "correct." It has ignored the influx into society of other and different cultural elements and has not been zealous to devise newer and better educational strategies. In a pluralistic society, these ethnocentric and academocentric assumptions need to be greatly modified. The testing movement as dominated by the Board, however, has accentuated them.

The Board has of necessity reflected the conservatism of its member colleges. The Commission on Tests should recommend that the Board reverse its position and take the lead in experimenting with a wider range of assessment devices. In this time of crisis support from the Board's member colleges for an experimental and innovative attitude may be more easily forthcoming than in the past.

To recognize adequately the interest of the individual will

require more than a change in tests. It will require a change in the habits and assumptions on which college admissions policy is based. When testing is focused primarily on the individual rather than on the convenience of the college, there is imposed on colleges a greater obligation to take risks. Attrition is to be expected rather than shunned. If no attrition occurs, the college is playing it too safe. Dropouts are by no means always or necessarily a bad thing. The unexamined assumption that the version of educational experience that a particular faculty has produced is a valid educational standard results in many students being tagged as "failures" simply because they do not respond to that particular pattern of stimuli.

Normative testing has led to a series of closed feedback loops through the following steps: (1) validation of tests (along with other predictors) against college performance (as expressed for example in grade-point averages); (2) prediction of performance based on a regression formula derived from this validation; and (3) selection of entering students according to the formula, thus maximizing correlation between predictor and criterion. This is a tightly constrained system of reasoning that gives little incentive to change conventional faculty-oriented methods of presentation or assessment. And college faculties made up of individuals whose very life blood is critical reasoning and assessment have often been laggard in applying these edged tools to their own attitudes and capacities vis-à-vis students. If they have shed illumination, it has been in the form of laser beams focused on their special fields.

The extraordinary performance of many dropouts in terms of ultimate social effectiveness casts serious doubt on this conventional sequence of validation, prediction, and selection. Faculties tend to want the "best" students according to these narrow criteria. There results a "collegiocentric" selection in which faculty preference and convenience often takes precedence over the student's interest in his own long-range development and social effectiveness. The unregenerate professor who remains un-

touched by any vision about the broad social consequences of education is happiest when he can teach more and more to fewer and fewer and better and better students. Faculty opinion is the dominant force in the admissions practices of the stronger institutions. The testing problem is so closely involved with admissions policies that the Board's freedom of action is limited. The deep roots of inertia reach back into the colleges and into beliefs about student selection that may prove ill-founded. There is real question whether individual colleges (1) *can* select the students who in the broadest sense are the most promising, or (2) are, in the public interest, necessarily entitled to do so. Yet these two assumptions have been, from time immemorial, unquestioned dogma in most colleges.

Skepticism about the closed circle of validation, prediction, and selection is justified not only on these broad grounds but also more narrowly by increasing doubts about the entire structure of marks and grade-point averages in higher education. These devices are being increasingly condemned as anti-intellectual in tendency. A device that began as a practical convenience in dealing with large classes becomes an end in itself, diverting the attention of both teacher and student from the central concerns of intellectual development. In response to these doubts, the structure of marks and course credits is being eroded by variants of "pass-fail," and similar arrangements. Marks are seen as "minimum information" devices. Their use as a criterion is thus open to question also on the practical ground that they will be less available as time goes on, as well as less closely coupled with the realities of what is happening in the mind of the student.

The conventional quantitative approach to testing emphasizes the status achieved after learning rather than an identification and understanding of the process and mechanism by which learning occurs. Testing, then, if it is to represent assessment in the broadest terms should determine the appropriate *complementation* rather than comparison. The student should be educated to complement the learning he already has, rather than

just to compare it with the learning others have.

Monitoring of performance as a basis for determining quality can be an on-going part of teaching rather than primarily a means of determining the destiny of the individual.

There is a wide field still undeveloped for the characterization (not necessarily measurement) of attitude, function, motivation, style, and temperament as well as of ability and achievement, and ample scope for research in developing the kinds of instruments needed for such characterization.

Beyond the individual college, testing is closely related to the wider issue of whether the annual distribution of entering students among some 2,000 colleges approaches an optimum pattern from the standpoint of the public interest. No one knows whether it does. Few individual colleges have even glimpsed the existence of this issue, so intent are they on their own supposed institutional interests. The biologist, J. T. Bonner, makes the arresting suggestion that the selective colleges may in fact be all unconsciously effecting a kind of counterselection that diverts the most promising students into the nonselective, "open door" colleges.[1]

Prediction and selection can never be wholly eliminated in education, but increasing emphasis should be laid rather on diagnosis of the individual's needs and on prescribing the next step he should undertake. Testing with this objective would exist in an affirmative context of optimizing the benefits of the next step rather than in an exclusionary context of deciding who is to be denied a specified educational opportunity.

The traditional approaches to testing for college admissions are ill-adapted to the diagnostic objective. They are essential only if one grants as valid current college faculty preferences and habits and current admissions policies centered on the supposed interests of particular institutions in maintaining these prefer-

1. "A Biologist Looks at Unnatural Selection." *Princeton Alumni Weekly*, Nov. 23, 1962, pp. 6–16.

ences and habits. These are in part traditional and retained through sheer inertia, but in large part they are traceable to the preference of college teachers to teach those who are easiest and most fun to teach. These generally turn out to be those already furthest along toward becoming copies of the teacher himself. It is these, in the jargon of the trade, who are said to be able to "profit" by higher education.

Tests in the context of transition to college were originally devised to serve the interests, real or supposed, of the colleges themselves. The basic assumption was that a certain minimum of formal knowledge was indispensable for the beginning college student. The present use of test scores in a normative context introduces a competitive factor that was at most a minor part of the original plan. The intensity and artificiality of the competitive aspect in recent years has strengthened the antitest revolt. Even the College Board's Preliminary Scholastic Aptitude Test, which was, nominally at least, devised to aid guidance, is used in practice mostly to adumbrate the probabilities of admission to particular colleges.

Aptitude tests that measure mastery of the mother tongue of the dominant subculture impose a heavy and permanent handicap on all minority groups. There is a bitter truth in the oft-repeated injunction that one "cannot study for" the College Board's Scholastic Aptitude Test (SAT). One has to be born and raised to it. It is of interest that "disadvantaged" students generally lag less in mathematical than in verbal skills; the quantitative symbol system is learned later and somewhat more artificially than the verbal system of the mother tongue. To learn it requires a conscious effort on the part of all, whether or not they are already at home in the use of the mother tongue. Thus, in arithmetic, all start more nearly even.

This issue about the "unfairness" of aptitude tests with reference to particular minority groups is of course an old one. The conclusions of most discussions about it are (1) that since competence in standard English is indeed a prerequisite to any effec-

tive higher education, aptitude tests, however "unfair," must continue to stand, and (2) that the remedy lies in early education —Head Start and all the rest of it. All this, up to a point, is true.

But there may be a broader dimension to the problem. To anyone brought up in traditional academic disciplines the written expression of many high school students, even those in the main stream of the national culture, seems semiliterate and barbarous. It is possible to function successfully and effectively in society using language of a kind to make any college professor shudder. So the possibility that there may be a cultural lag here that will never be made up must be entertained. Standard English, SAT version, may be an echo from the past of a generation or two back. If (as seems to be the case) the effective work of the world in the long run turns out to be carried on in large measure by people with a very wide range of test scores and widely varying degrees of literacy, it may be that prim insistence on these so-called predictors is not so much a necessity as an academic foible.

There is an inevitable and everlasting tension, which testing may have to reflect, between the "official" language of the dominant few and the vigor of popular usage. In John Hersey's eloquent words, written in a letter to me: "The latter feeds into the former and keeps it warm. Testing must go on discovering the future guardians of precision in human communication; *but* testing must stop acting as if these were the only educable human beings. Let us not cave in to the motion toward the grunt as the only form of human speech; let us also, though, whisper into the ears of some, who by misfortune have only learned to grunt, the words, let's say, of Shakespeare, who was white, of Lao Tze, who was yellow, of Aesop, who was black, of Pushkin, who was black-and-white, to show that precision belongs not to a 'dominant subculture' but to mankind and that we all need it in order to live together. This is not to 'lower standards.' Elegance and precision in the use of words will be no less pursued than all other manifestations of excellence. But let us not debar from

educational opportunity those upon whom these ornaments have not descended as a birthright."

The Commission heard testimony from the examining committees of the Board which led to the conclusion that the present Achievement Tests of the Board have been reduced almost to the condition of tests of academic aptitude just a little more specialized than is the Scholastic Aptitude Test. This suggests that the Board as a conservative first step might aim at eventual phasing out of the Scholastic Aptitude Test in favor of a variety of diagnostic instruments to measure particular skills and competencies. Tests like these would have the great advantage of increasing flexibility. The college could choose, or determine how far it would allow the student to choose, what assortment of abilities it would ask for. The rigidity of the SAT with set parts of predetermined size, would be reduced.

The above recommendation is simply a practical change well within the conventions and philosophy of the existing system. Briefs by other Commission members, and one of my own, suggest a much wider range for exploration and experiment.

The Board should explore various versions of student-centered tests, both those aimed at answering the student's questions about how he compares with others in conventional subject-matter areas, and those aimed at gauging his response to various educational styles and environments. Modular tests of competency in clearly defined small units have great promise, as do aids to the student in organizing and utilizing his own self-estimates. Throughout, the measurement objective should so far as possible be subordinate to the imaginative grasp of the subject area itself. The response of the intellect to the world around it, the alternation of long and near focus, the emphasis on the one hand of contemplative thought and on the other of hair-trigger response, are all values to be conserved and studied. They should weigh heavily as against supposed increments of precision in measurement.

In sum the Board should probe, experiment, explore, and

above all refuse to allow its collective imagination to be tethered to conventional modes. It may be difficult to move the now ponderous Board-ETS complex out of its accustomed grooves, but much more difficult will be the task of getting college faculties to change their ways. The Board, if it wishes, can make its influence felt in this direction. The colleges are worried and beginning to be willing to take a second look at themselves.

A Note on the Speededness of Existing Tests

It is my conviction that the speed element in the current Board tests constitutes a more serious constraint on their usefulness than seems to be recognized in the ETS studies of the subject. These studies conclude that the tests in general are only "slightly speeded." ETS routinely produces extensive, detailed statistics on *degrees* of speededness among various tests. These are believable and useful as intertest measures of *relative* speededness. What they do not and cannot provide is any absolute measure of speededness or its effects on the student's thought processes or his morale. Speededness as a psychological principle is like entropy: one can measure increments, but never the absolute amount.

The basic assumption, which seems to me fallacious and, on the face of it, erroneous is the following: "A test may be regarded as essentially unspeeded if at least 80 percent of the candidates reach the last item, and if virtually everyone reaches three-quarters of the test."[2] The various statistical matrices that show in an ingenious way the *relative* degrees of speededness of particular tests are all erected on top of this basic assumption. The assumption seems erroneous, since it is unquestionably true that the great majority of candidates are under the *threat* of not finishing, and this includes most of those who actually do succeed in

2. From an unpublished analysis of the January 1967 administration of the College Board Achievement Tests. Princeton, N.J.: Educational Testing Service, 1967.

reaching all the items. Under this threat, the student's entire approach to each item is of necessity based on snap judgment, not on considered and deliberate thought. He knows that speed is of the essence, and that a lack of it is quite likely to affect his score adversely. This issue illustrates the general truth that the quantitative and statistical aspect of normative testing must rest, at last, on psychological assumptions that can only be tested in vague and subjective ways. The Board should prefer evidence of intellectual power to speed of response.

If, as I hope, greater use comes to be made of student-centered, self-scored, and self-administered tests, the speededness issue will be somewhat less serious. Meanwhile I believe the Board should consider some reduction in speededness by reducing the number of test items, even at the cost of some slight loss of reliability.

The speededness issue is related to the purely practical question of whether it is important that a normal test program be completed in a single day. When test centers were fewer, and transportation more difficult, the necessity of staying overnight near a test center imposed serious hardships on students. If this is still the case, it strengthens the argument for reducing the number of tests in a day, with more time per test. This matter deserves review in connection with the speededness issue.

Recommendations

It is recommended that the College Entrance Examination Board:

1. Experiment actively with a system of modular, diagnostic instruments designed to test important competencies; these would, in principle, resemble the present Achievement Tests.

2. Make these available to colleges as a means of permitting greater flexibility in the choice of combinations of tests selected by the student, and required or permitted by the college.

3. Continue the Scholastic Aptitude Test for the time being, with such improvements as may be possible.

4. Encourage member colleges gradually to replace the Scholastic Aptitude Test with its fixed, predetermined parts or modules, by more flexible assortments of modular tests.

5. Reduce the speededness of its tests by reducing the number of items per test, even at the cost of some loss of reliability.

Record of Endorsement, Comment, Reservation, and Dissent on the Recommendations in *Diversification in Educational Assessment*

It is recommended that the College Entrance Examination Board:

1. Experiment actively with a system of modular, diagnostic instruments designed to test important competencies; these would, in principle, resemble the present Achievement Tests.

Endorsed by 17 members: Abelson, Blocker, Carroll, Coleman, Foster, Friedenberg, Gordon, Hechinger, Hersey, Holtzman, Hoy, Marland, Pearson, Prentice, Shirley, Thresher, Tiedeman.

Carroll: "In particular I wish to express reservation about one aspect of Thresher's first recommendation, namely that his modular, diagnostic instruments '. . . would, in principle, resemble the present Achievement Tests.' Thresher does not develop this point in his brief; therefore, I cannot be sure in what respect he wants the proposed tests to resemble the present Achievement Tests. If he means that they should sample achievements in various subject matters such as English, mathematics, science, and so forth, I believe they would be subject to many of the same criticisms that have been leveled against the present Achievement Tests—inadequate sampling, the assumption of uniformity in the curriculum, undue influence on the curriculum, improper timing of test administration in relation to the student's stage of preparation, and so on. The whole experience

of the College Board has suggested that tests of intellectual skills, such as the parts of the Scholastic Aptitude Test (SAT), are much less subject to this kind of criticism. If I were to rewrite this recommendation, I would suggest that the last clause read as follows: these would, in principle, resemble the present aptitude tests. They would resemble the present aptitude tests in that they would measure general intellectual skills of various sorts, rather than specific knowledge or skills in specific subject matters.

"Thresher seems somewhat resistant to the idea of testing general intellectual skills. He claims that it is an affront to the individual to be required to take a test that he cannot study for. I would argue that this claim reflects a very narrow view of what intellectual skill consists of. To be limited to constructing tests of achievements that an individual *starting from scratch* could study for in, say, no more than a few months would be very limiting indeed. Perhaps a test of a foreign language vocabulary or a test of knowledge of the geography of Rhode Island would be examples of the kinds of tests that could be given under this restriction. The fact is that the individual never starts from scratch (at least, the individuals likely to be under consideration in the college admissions process). The very act of studying for a test usually presupposes a long educational history; even studying for a test on Rhode Island's geography presupposes that the student can read and understand the language in which his lessons are couched, can remember, can make inferences, and so forth. In testing general intellectual skills we are more interested in what the individual has acquired from his lifetime educational history than in what he may have acquired from a short term of study.

"In a sense, a student *does* study for the present SAT. That study, however, is not something he can do overnight or even in a few months; the study is what he does in the course of his whole educational history. But it is a sheer exaggeration to say that one has to be born and raised to the culture implied by the SAT in order to do well on it. Many people with ample educa-

tional advantages do *not* do well on it, but many people who would *appear* to have suffered educational disadvantages—poor formal education, bilingual background, or the like—have been able to do well on it, by virtue of their own efforts to read and educate themselves over a fairly protracted period."

Shirley: "I certainly endorse this recommendation to experiment and test this mode of operation against the present program. No one can be against research or experimentation on the effectiveness of what testing is truly doing. New testing modes should be sought, but simplification, rather than complication, of the testing process and program should be the touchstone."

Not endorsed by 1 member: Schlossberg.

1 member abstained: Pace.

2. Make these available to colleges as a means of permitting greater flexibility in the choice of combinations of tests selected by the student, and required or permitted by the college.

Endorsed by 16 members: Abelson, Blocker, Carroll, Coleman, Foster, Friedenberg, Gordon, Hechinger, Hersey, Holtzman, Hoy, Marland, Pearson, Prentice, Thresher, Tiedeman.

Prentice: "Security can be a serious problem if tests are made available to colleges. If that problem can be overcome, I approve of the recommendation."

Not endorsed by 2 members: Schlossberg, Shirley.

Shirley: "This recommendation (and Recommendation 4) prejudges the results of the research requested in the first recommendation. The decision about what tests should be continued ought to be based on the research and exploration. If we now know what is proper, we should advocate elimination of the present tests and adoption of new ones. At this stage only one thing is sure—we do not *know;* we have only biases, prejudices, and beliefs."

1 member abstained: Pace.

3. Continue the Scholastic Aptitude Test for the time being, with such improvements as may be possible.

Endorsed by 16 members: Abelson, Blocker, Carroll, Coleman, Foster, Gordon, Hechinger, Hersey, Holtzman, Hoy, Marland, Pearson, Prentice, Shirley, Thresher, Tiedeman.

Not endorsed by 2 members: Friedenberg, Schlossberg.

1 member abstained: Pace.

4. Encourage member colleges gradually to replace the Scholastic Aptitude Test, with its fixed, predetermined parts or modules, by more flexible assortments of modular tests.

Endorsed by 16 members: Abelson, Blocker, Carroll, Coleman, Foster, Friedenberg, Gordon, Hechinger, Hersey, Holtzman, Hoy, Marland, Pearson, Prentice, Thresher, Tiedeman.

Foster: "As is now being done by the Board."

Not endorsed by 2 members: Schlossberg, Shirley.

Shirley: "See my comment under Recommendation 2."

1 member abstained: Pace.

5. Reduce the speededness of its tests by reducing the number of items per test, even at the cost of some loss of reliability.

Endorsed by 14 members: Blocker, Carroll, Coleman, Foster, Friedenberg, Gordon, Hechinger, Hersey, Hoy, Marland, Pearson, Shirley, Thresher, Tiedeman.

Foster: "Possibly, but this is taken care of in part by Recommendation 1, above."

Hersey: "Speed of response may well be one of the gifts that should be considered valuable for some but not all processes and functions and perhaps one mode of a set of diagnostic instruments should test for it."

Not endorsed by 4 members: Abelson, Holtzman, Prentice, Schlossberg.

Abelson: "In general I agree with Thresher's comments and recommendations, except for Recommendation 5 on speededness. A very important factor in a person's ability to operate successfully in this world is to be able to function effectively under stress. Very frequently the ability to make quick decisions at a moment of crisis is a determining factor in success or failure. I feel that to comply with Thresher's Recommendation 5 would be a step backward."

Holtzman: "I would prefer allowing more time as a possible alternative to reducing the number of items—at least for some tests—since reliability is of importance in individual measurement."

Prentice: "If tests do not predict something, they cannot be said with confidence to convey any information. If reliability is diminished, so will prediction be. Validity is very low now, and I do not think we can justify poorer prediction. The concern about speededness is based on the belief that some students have 'power' not measured in speeded tests. The way to get at that 'power' (if it exists) is to design tests that are fair to that minority of students. In principle, such tests should be *more* reliable and more valid."

1 member abstained: Pace.

General Comments

Carroll: "I endorse these recommendations, since they seem in general to agree with the recommendations in my brief, "Possible Directions in which College Entrance Examination Board Tests of Abilities and Learning Capacities Might Be Developed," but I wish to express reservations about some of Thresher's assumptions and also about certain particulars of his recommendations.

"For the record, I must state that I cannot agree that the psychometric basis of testing seems to erect a formidable structure of mathematical logic on a foundation of psychological assump-

tions that are of uncertain validity. It would take me too long to develop my point adequately, but I would affirm that present testing practice is based on a rather large body of theory and on empirical evidence that hangs together with that body of theory. To a large extent psychometricians *do* know what they are measuring. For example, factor analytic research has disclosed a number of independent dimensions of cognitive ability, and it is possible to construct fairly refined tests of each of these dimensions. One psychologist, J. P. Guilford, has developed a theory of the structure of the intellect that attempts to classify cognitive abilities according to a grand taxonomy based on the content and outcomes of mental operations. I would be the first to point out that knowledge about cognitive abilities is still imperfect and incomplete, and that there is not universal agreement about what is known; yet, I would also be the first to refute the impression conveyed by Thresher's brief that testing practices are built on sand.

"In the case of subject-matter achievement tests I can perhaps understand the criticism that current tests measure not what the student knows but what he does not know, but I do not think the criticism has much force when applied to tests of intellectual skills. In large measure, the intellectual skills that are involved in higher education *can* be identified, and how well a student has acquired these skills can be measured with considerable accuracy. Indeed, I personally attach more credibility to test outcomes than to the criteria that are normally used for validating tests. Granting that validity studies smack of circular reasoning, I hesitate to enter the circle.

"I am willing to follow Thresher in feeling skeptical about the assumption that the intellectual skills measured with present tests are indeed the intellectual skills most imporant for academic or other kinds of success. This does not mean, however, that we who are concerned with testing should completely lay aside our present knowledge of cognitive abilities. Rather, we should work within the present framework of theory and established scientific procedures to perfect our knowledge and improve our

testing practices. If the educational system is changing its built-in academic standards (and I am not sure that the standards are changing as rapidly as Thresher implies), test research should take this into account. Test research also can and should take into account the fact that society is pluralistic and has many subcultures and different sets of standards and values.

"In summary, I feel that the line of argumentation that Thresher adopts is very seductive and very much in tune with contemporary rhetoric in some quarters, but it fails to take adequate account of scientific knowledge and perspective in the psychology of individual differences and learning."

Foster: "In Thresher's first paragraph he says the College Board should be prepared gradually to reduce reliance on present testing modes. I think the phrase 'if it proves advisable' should be added (we don't know yet).

"Thresher states that testing has developed primarily in the interests of the colleges, not of students. I am still old-fashioned enough to believe tests are a useful educational experience and can even be enjoyable when not taken as life-and-death matters."

Pace: "I see this brief as a general essay—of substantial merit —on some of the educational, philosophical, and psychometric assumptions upon which much of present testing practice rests. As such, it is a significant background paper for subsequently explaining why changes in certain directions are recommended. I *do not* see that the particular recommendations are a necessary conclusion from the brief. Therefore, I choose not to endorse any of them specifically. Rather, I thoroughly endorse the intent and reasonableness and need for what is implied by the title of the brief—that is, diversity in educational assessment."

Schlossberg: "The reason I do not endorse these recommendations is that I think competencies can be assessed in other than paper-and-pencil ways. Games, simulation, work samples, and so forth would diversify measurement procedures, but just increasing kinds of achievement-type tests is not the answer."

A Proposal for Self-Scored, Self-Administered Tests

B. Alden Thresher

The principle of symmetry that forms the central theme of the Commission's recommendations can be implemented in a number of ways, all calculated to increase the student's knowledge and understanding of himself, the educational opportunities open to him, and the world around him. The present brief suggests a single mode that seems promising. It is not proposed that this replace all other kinds of testing, but rather that it be initiated and experimented with seriously with the idea that it might come to form an important part of the Board's armamentarium of tests. In this mode psychometry would be less central to the operation than it now is. The psychologist and statistician would remain important auxiliaries, but the teacher would be the central and determining influence to a much greater extent than at present.

Every teacher knows that the best time to get an idea across is right after students have taken a test on the subject and are keyed up, alert, and questioning. A discussion at this juncture can be unusually fruitful because it falls on prepared ground. It is unsound not to utilize this important principle. I think it is possible to go further and say it is demeaning, unethical, and educationally unsound to subject a student to a test without discussing it with him, or if this is not feasible, at least providing him with a reasoned analysis of it as soon as possible afterwards. If no discussion takes place, the student reads the signal; they are more interested in judging me than in educating me. This lack of education follow-through constitutes one of the major drawbacks of the present mode of testing. Present tests not only miss entirely the opportunity to extend and deepen understanding of the particular subject being tested. They have the more serious defect of failing to reinforce in the student the habit of questioning, discussing, developing ramifications of thought, comparing frames of reference, viewing in more than one perspective. In general there is a complete failure to open out the subject by any play of the intellect. The habit of dropping all further concern with a topic once the "right" answer is found is damaging to the

life of the mind. The student never comes within sight of the idea that no subject is ever permanently closed off from discussion, no conclusion forever final and irreversible. It is this anti-intellectual effect of the prevailing test mode that constitutes the most serious defect in a system that otherwise has much to commend it. Measurement is not without its uses, but it has come to crowd out other and more subtle but more important objectives.

Proposals to meet this situation have included branching tests and tests that seek to determine the student's reasons for having chosen certain answers to a previous test. These have some merit, but neither meets the central problem because no reasoned analysis ensues.

The central proposal here, therefore, is that self-administered and self-scored tests be instituted and made available to students in great profusion. I believe Coleman proposed this principle at the first meeting of the Commission on Tests, and the present proposal simply elaborates one phase of his idea.

The testimony heard by the Commission from teachers on test committees was most illuminating. They were doing a skilled job constructing items with real teaching merit. The more they followed their teaching impulse, the more frustrated they became, because there was no opportunity for the student to benefit from this devoted effort. Only a tiny residue of "measurement" came out of the whole process. There is a kind of tragic irony in thus setting good teachers to do a job that throws away most of their talent and skill. One could tell from their remarks that they sensed it.

Under the present proposal, every time a test committee generates a test item, they would produce an accompanying reasoned discussion about the choice of an answer. This would go beyond the simple justification for the "right" answer as now given for the illustrative questions in the explanatory booklets prepared for the tests. Possible reasons for choosing alternative answers would be discussed, taking account of how a student with a different frame of reference might approach the question.

Some item analysis and pretesting statistics might be included. In other words what is now compulsively and secretively covered up would be thrown open, and the student invited to participate in the exercise of reason. Both test and statistics would be put in the public domain.

Depending on the use and purpose of the test, the student's access to the reasoned explanation could be deferred by varying degrees. Two principal cases suggest themselves: (1) For truly self-administered and self-scored tests, the discussion could be put at the back of the test booklet, either with a seal or with uncut pages. The student, if he really wishes a self-appraisal could be told to read this material, preferably as soon as possible after finishing the test. (2) For truly "adversary" testing in the present mode, with measurement the prime purpose, the discussion could be distributed to testees at the end of the test, or even sent to them later.

Advantages of the Student-Centered Approach

1. The problem of speededness vanishes in a self-scored test except as retained at the student's option. It could and should be moderated in any tests that continue to be conducted in the completely adversary mode with the student as defendant.

2. In a self-scored test the security problem vanishes. If the student wishes to cheat, he cheats only himself and would probably also cheat at solitaire.

3. The student would no longer feel threatened or manipulated, or be a defendant in a process carried on not necessarily for his benefit. Even in the adversary version, he would not be flying completely blind.

4. The test committees could at last feel that they are functioning as teachers. Especially impressive was the testimony heard by the Commission from the history and physics people, who seemed to me to be suffering from frustration as good teachers not allowed to teach. A score is, after all, a minimum-

information device, and critics are undoubtedly right in objecting that this is not an adequate summary of any student, even within the limited area that the test purports to measure.

5. Self-tests and quizzes have an immense psychological appeal as is apparent from the number constantly appearing in the popular press both in serious and frivolous contexts. To test oneself answers a deep human need. It helps the individual answer the, to him, all-important question: "How am I doing?"

6. Face validity or curricular validity would be restored as a major criterion for test items, and a corresponding reduction could occur in the kind of statistical pretesting and time analysis now carried on. Along with this would go a reduction in the emphasis on precise measurement, or rather the pretense of it. Granted that evaluation has its place, it cannot be, as applied to the individual and his prospects, more than a very rough guide. Marianne Moore has put it in a nutshell: "Why dissect destiny with instruments more highly specialized than components of destiny itself?" Psychometrics has gained an importance that should go rather to the processes of teaching and learning, not simply to their results.

7. Finally, the proposal for self-scored tests recognizes the basic principle that the best way to encourage the student to become a responsible person intellectually is to treat him as if he were one, not to fence him with safeguards that imply that he is expected to try to beat the game.

It will be objected that the proposal to accompany tests with a (printed) discussion of the question falls far short of the ideal give and take of oral, face-to-face discussion. This is a valid objection, yet the proposal at least represents a vast improvement over the present system in which the student drops his answers into the void and they are never heard from again—a situation nicely calculated to stifle intellectual curiosity. It would be well worth while to experiment on a small scale with groups meeting for oral discussion within a day or two after a test. Face-to-face discussion would give an opportunity to gauge the true psycho-

logical and intellectual atmosphere in which the tests are enveloped, and would, I think, introduce a wholesome nonpsychometric element. The student, instead of being an "it," to whom an instrument is "administered" could be looked over by an experienced teacher alert to the psychodynamics of the group, and the student (probably to his amazement) could respond, react, answer back, and have his views taken seriously.

Obstacles and Problems

1. By far the biggest obstacles to this proposal would be a complete reversal in the viewpoint and habits of thought characteristic of all testing organizations. These, in their whole origin and purpose are psychometrically oriented, instead of being primarily oriented to the teaching and intellectual values in tests. I would hope that the Commission on Tests might, with the cooperation of Educational Testing Service (ETS), set in motion a searching study of this problem to see how far it might be made practicable to carry out changes of the kind suggested. It will inevitably require a fresh initiative in a direction quite different from the present. Most important of all, it will bring into consideration a range of intellectual values that by their very nature cannot be made to stand or fall by the conventional "validity study" techniques. They will have to be appraised, in the end, by a global judgment in which teachers and students participate.

2. It would be necessary to increase the output of test items enormously. I recall being shown some years ago a file at ETS containing something of the order of 100,000 reserve items for the Scholastic Aptitude Test (SAT). These presumably have not in most cases been pretested or subjected to item analysis, or even to committee consideration. The policy has been to keep under lock and key a limited bank of test items carefully screened and pretested, and to economize by reusing them at subsequent test administrations. This miserly and secretive policy treats knowledge as if it were a closed and secret matter, hidden from the

public eye in the custody of a hieratic group. Nothing could be further from the spirit of free inquiry and universal publication.

I propose doing just the opposite. The object would be to flood the market with more test items than either student or coaching schools could possibly deal with individually, so that it would be less trouble to study the subject than to coach or memorize individual items. These would be in the public domain, protected by their great numbers. This ought to go far to put the coaching schools out of business.

To produce test items on the scale I am contemplating would require the services of a much larger number of experienced teachers and a complete restructuring of the present group of small committees, who by their own testimony to the Commission are hard put to produce even the items now needed for various dates and administrations. I would see this as a unique and priceless opportunity to involve actively many more teachers in the testing process, which should be the natural complement to teaching. The College Board has been plagued for years with the recurring criticism that active teachers do not feel they have any genuine part in the testing operation. The Board with all its works remains to almost all secondary school teachers a remote, inapproachable power whose actions are past understanding, and usually arbitrary and unreasonable. One can picture a new situation in which teachers in general are invited to contribute items, subject to screening by an expanded committee. A history teacher could say to a class: "Here are some questions I have proposed to the College Board Committee. Do you want to discuss them? Perhaps one will turn up on the test." The proposal would bring Educational *Testing* Service a step nearer to becoming *Educational* Testing Service.

Pretesting and statistical item analysis would presumably still be needed, but on a reduced scale especially for the fully self-administered and self-scored tests. Greater participation by teachers would go along with greater emphasis on face validity, and a reduction of the homogenizing tendency of statistical item anal-

ysis. Measurement might be crude, but with discussion and reasoned analysis playing a part, educational ends would be better served. Even "adversary" testing might well be affected by this trend. It might well be possible to drop from Board test scores the third digit, which has always misled the public by a spurious pretense at precision.

3. Introducing self-scored tests would, I think, lead to an eventual phasing out of the College Board SAT, as contrary in principle to the teaching objective. A test that one cannot study for is an affront to the student in appearing to brand him with an evaluation that no effort of his can hope to change. The eventual phasing out of the SAT would leave a body of tests along the lines of the College Board's Achievement Tests now in use, perhaps with added subjects, perhaps with smaller and more numerous modules, and with considerable choice open to the candidate. These would continue to serve such member colleges as wished to make use of them. It is essential that no Board member college feel that anything is being forced on it unwillingly, and the SAT would presumably continue for some time, unless a general strike against it by minority-group students should put it out of business.

The ETS view is that the Achievement Tests have, over the years, come to be more and more like aptitude tests because there are more items on the methodology of each subject and fewer factual items. This tendency exists, yet to draw this conclusion from it puts the cart before the horse. There will be increasing need in the future for people competent in data management and in the art of learning how to learn, people who retain plasticity and mental flexibility. These qualities, methodological though they may be, will increasingly constitute the subject matter of education. Aptitude tests should be reduced to achievement tests in the sense of reporting mastery of profitable knowledge and skills. For example, the Achievement Test in English Composition and the verbal sections of the SAT report

simply a mastery of standard English and have a high intercorrelation.

The basic objective should be to get the student's intellect working and to make it second nature to him to use his intellect. To get a precise measurement is by comparison of secondary importance. A rough quantitative appraisal may actually be better because it is not yet known what qualities might be usefully quantified, or how much of the apparent precision in test scores is, as has been frequently alleged, spurious or premature.

4. Any proposal to phase out the SAT, the mainstay of the Board's income, must raise serious financial questions. Under the general approach proposed above, there would seem to be three mitigating factors: (a) Phasing out would be gradual, on the assumption that some member colleges would want to continue the SAT, for a time at least. (b) Then, if the SAT were eventually dropped, member colleges who might wish to continue "adversary" testing (and this number would probably be large for some time) could make a greater use of the new Achievement Tests. This use would go far to replace SAT revenues lost. (c) A more difficult problem would be maintaining a flow of the self-scored and self-administered tests to students and of financing them. The most obvious device would be to make the purchase of one or more of these a prerequisite to taking an Achievement Test of the adversary type.

It would be premature to go into detail on these proposals at this stage. I believe that it is desirable, however, for the College Board to take a careful look at the broad principle involved: an increase in emphasis on the educational and intellectual aspects of testing, partly to supplement, partly to replace the exclusively measurement emphasis. Even if there should seem to be a good case for continuing tests as adverse procedures, the educational aspect could still be concurrently developed. Enlightened admissions policies in the colleges will be a prime requisite, and the Board can take the lead in encouraging them.

Self-scored and self-administered tests would ease the overemphasis on test *scores* as an aid to guidance. Though guidance will, for a long time, require the dubious strategems of college choicemanship, it can be given also a needed impulse in the truly educational dimension. The student can begin to see that the important thing is not where he goes to college, but what he does when he gets there. He can begin to develop some critical sense about his own efforts. He can test himself or, if he wishes to retain this option, have himself tested in a manner that engages, respects, and develops his growing intellectual powers. This is an introduction to the life of reason, as opposed to an attitude of "find out what they want and give it to them." I hope very much that it may be possible to work out some device that will bring some of this spirit into the Board's operations and even into testing at large. I offer the above as a first, groping effort in this direction.

Recommendations

It is recommended that the College Entrance Examination Board:

1. Supplement its present programs with self-administered and self-scored tests, made available to students in great profusion, and accompanied, under various degrees of delayed availability, by reasoned discussions about the choice of an answer for each item.

2. Draw teachers, particularly those in secondary schools, into large-scale participation in the production both of these tests, and of tests in the conventional "adversary" mode.

3. Stress face or curricular validity in the selection of test items, stress items of teaching merit.

4. Invite, experimentally at least, groups of students who have taken a test soon thereafter to participate in an oral discussion of the test under the Board's auspices.

Record of Endorsement, Comment, Reservation, and Dissent on the Recommendations in *A Proposal for Self-Scored, Self-Administered Tests*

It is recommended that the College Entrance Examination Board:

1. Supplement its present programs with self-administered and self-scored tests, made available to students in great profusion and accompanied, under various degrees of delayed availability, by reasoned discussions about the choice of an answer for each item.

Endorsed by 15 members: Abelson, Blocker, Coleman, Foster, Friedenberg, Gordon, Hersey, Holtzman, Hoy, Marland, Prentice, Schlossberg, Shirley, Thresher, Tiedeman.

Holtzman: "My endorsement is qualified, since I'm not sure that we should really *flood* the world with such items."

Prentice: "It would be impossible, I think, for educators to disagree with Thresher's motives and implied criticisms of present procedures, but I think there is a romantic appeal to his proposals. Only if the schools are doing an extraordinarily bad job of teaching should the College Board have to carry out Recommendation 1. If the schools really need such a national program, I favor the Board's trying to provide it; otherwise, the teaching value provided by a few hours of tests seems to me trivial compared with that provided in the 12 years that teachers have spent with every student."

Not endorsed by 4 members: Carroll, Hechinger, Pace, Pearson.

2. Draw teachers, particularly those in secondary schools, into large-scale participation in the production both of these tests and of the tests in the conventional "adversary" mode.

Endorsed by 14 members: Abelson, Blocker, Coleman, Foster,

Gordon, Hersey, Holtzman, Hoy, Marland, Prentice, Schlossberg, Shirley, Thresher, Tiedeman.

Holtzman: "Again, I have reservations about the wisdom of implementing this recommendation on a large scale."

Prentice: "If we accept Recommendation 1, Recommendation 2 is inevitable."

Shirley: "I understand that this *is* current practice."

Not endorsed by 5 members: Carroll, Friedenberg, Hechinger, Pace, Pearson.

3. Stress face or curricular validity in the selection of test items; stress items of teaching merit.

Endorsed by 16 members: Abelson, Blocker, Coleman, Foster, Friedenberg, Gordon, Hersey, Holtzman, Hoy, Marland, Pace, Prentice, Schlossberg, Shirley, Thresher, Tiedeman.

Pace: "Presumably this applies to 'achievement' tests and is being done now as far as curricular validity is concerned."

Prentice: "This has great merit as long as 'face validity' does not come to *replace* predictive validity. Users of tests need both (and so do students!)."

Not endorsed by 3 members: Carroll, Hechinger, Pearson.

4. Invite, experimentally at least, groups of students who have taken a test to participate soon thereafter in an oral discussion of the test under the Board's auspices.

Endorsed by 16 members: Abelson, Blocker, Carroll, Coleman, Foster, Friedenberg, Gordon, Hersey, Holtzman, Hoy, Marland, Pace, Schlossberg, Shirley, Thresher, Tiedeman.

Carroll: "I endorse Thresher's fourth recommendation if it is taken to apply only to tests now used, or likely to be used, in admissions, placement, and guidance programs, only because probing students' reactions to these tests would further help the Board understand the nature and functioning of these tests and

perhaps improve them in certain directions."

Holtzman: "OK as an experiment, on a small scale."

Shirley: "I see no reason not to try this, but I confess I am skeptical about what it will contribute. I was once a student, and it is my sincere conviction that I am wiser about education on the basis of my present experience than I was during my late teens and early twenties."

Not endorsed by 3 members: Hechinger, Pearson, Prentice.

Prentice: "This strikes me as carrying the implications of Recommendation 1 to wholly impractical lengths."

General Comments

Abelson: "Mr. Thresher's remarks would be valid if all examinations that students undergo were conducted so that there were no post-mortem discussions of the tests. I see no harm whatsoever when a limited percent of the tests are conducted in the manner of the SAT evaluations."

Carroll: "I am sympathetic with many of Thresher's concerns, but I can endorse only one of his recommendations, and that only in a limited way.

"The basic recommendation, to provide self-administered tests (presumably, in the main subject-matter achievement tests) for use by students and teachers in discussions of test content, would be very expensive to implement, and I doubt that it would achieve the objectives implied by Thresher in introducing his proposals. Further, there are some implications of the proposals that would take the College Board out of its proper sphere.

"I agree that tests cannot have a truly educative function unless they are followed up by discussion or other kinds of informational feedback. Teachers have been advised to use tests in this way ever since the testing movement got started. Even Socrates used questions to stimulate thinking. But just how many teachers use formal or informal tests to stimulate discussion of test con-

tent and how much time they allocate to such activities are questions for which there are no good answers. I have the impression that teachers do not use tests (even their own tests) in this way very extensively, for lack of time or inclination. There is too much to cover in the usual course of instruction. Even if self-administered, self-scored tests were made available to students in great profusion, I doubt that these tests could adequately sample curricular content or that they would be used as much as they would have to be to justify the cost of their construction and distribution. (Exactly who would pay for them, anyway?) Already there are tests and books of test items on the market—some of them good, some not so good. I cannot see why the College Board should get into that market. And I doubt that the availability of the self-administered tests would really achieve the objective of yielding symmetry in the relationship between the College Board (or the colleges) and the students. Students are not likely to perceive the tests as being related to their chances of college admission.

"In this context it is necessary to distinguish between the educ*ative* and the educ*ational* uses of tests. Tests are used educ*atively* in the course of instruction. But tests can also be used educ*ationally*—in admissions, placement, guidance, and so forth--or, in other words, in connection with various educational functions that may have nothing directly to do with teaching the particular content of the tests. The traditional (and, in my opinion, the proper) role of the College Board has had to do with these latter functions. I do not believe that the Board should involve itself so intimately with the educative process as to circulate materials for direct use in instruction (apart from their use in connection with present Board programs). This is, in effect, what Thresher is proposing. Already the Board exerts too much influence on the content of the curriculum; Thresher's tests would tend to increase this influence.

"I sympathize with the observation that teachers who construct tests on College Board committees may feel frustrated by

the fact that the educa*tive* effects of such activities are minimal. I would argue, however, that the educa*tional* effects of these activities are very far-reaching already, in the curricular influence of the tests. I would agree that if possible there should be a broader participation of teachers in the construction of the College Board tests; the present committees are in many cases too small and inadequately representative. But any proposal whereby teachers would participate in the construction of tests for purely instructional purposes would be, in my opinion, out of the realm of proper activities for the Board."

Coleman: "The following comments apply to the first three recommendations.

"A change in the general orientation of achievement tests toward face and curricular validity and toward a serious intellectual endeavor is, I think, highly desirable. The achievement tests would come to have greater similarity to the British and European examinations at the end of secondary school, and less similarity to aptitude tests, than is currently the case. It should be recognized, however, that this does make the test score more dependent on the quality of the applicant's secondary school training than at present, and less dependent on his ability. It should be recognized also that some economical means of test construction and standardization or norming is necessary to combine the virtues discussed in the brief with the statistical virtues for predictive purposes that current tests have, without increasing the cost of testing to the student.

"I believe it is possible now to devise testing procedures with the serious intellectual content and educative properties proposed in the brief, without forsaking the psychometric predictive properties of current College Board tests. Efforts should, I believe, be directed toward such a combination, rather than toward either refinement of present techniques in the direction of better predictions or tests with educative value but with poor predictive value.

"It should be pointed out, in any discussion of timed tests,

that curtailment of time in test-taking is a tester's substitute for presenting a greater intellectual challenge in the content of the test, and as such is a rather poor substitute, whether used by a teacher or in a standardized test."

Foster: "Thresher's statement in the second paragraph that to subject a student to a test without discussing it with him is 'unethical' appears to me exaggerated. Granted it would be preferable to discuss each question with each student, the student's interest in showing his competence must make the imperfect mass process worthwhile. Printed answers available for discussion in school would help, possibly assisted by a carbon copy of his responses kept by the student.

"In the list of advantages of a student-centered approach I disagree with the second. Much as one believes in an 'honor system' where it exists, this suggestion may impair the accuracy of the information transmitted to the college. The student cheats more than himself.

"About the eventual phasing out of the SAT: only along the lines of substitutions suggested in Commission meetings and in fact already partly in effect. Later, in the same paragraph, I wonder if mentioning the possibility of a strike against the SAT by minority-group students is wise.

"I question the wisdom of including the subject of the financial questions involved in phasing out the SAT. It puts the idea of bias from 'personal interests' of the Board into the report and into the heads of many who would otherwise not worry about it."

Pace: "One recommendation in the brief is not listed among the numbered recommendations — namely, that the SAT be phased out gradually. I do *not* endorse this notion. Instead, I endorse Carroll's proposals to revise the SAT along certain more diagnostic lines."

Pearson: "I don't believe these recommendations will accomplish the objectives in Thresher's brief."

Can a Machine Admit an Applicant to Continuing Education?

David V. Tiedeman

Prologue

My service on the Commission on Tests coincides with an opportunity I have had to construct and experiment with an Information System for Vocational Decisions (ISVD) in collaboration with several colleagues at Harvard, the Newton School Department, and the New England Education Data Systems.[1] The plan for the construction of the ISVD deliberately called for simultaneous revision of the software that controls a real-time interactive computer response, with the purpose of making it possible for a person and the computer programs with which he interacts to understand each other—not fully, only better—in a series of interactions.

The simultaneous development of computer and guidance softwares for the ISVD has created a cyclical interaction: guidance demands cause change in computer software, and change in computer software in turn provides capability for new guidance functions. The experience has indeed been a powerful one and has brought me to understand something of the ways in which form and idea modify each other as they evolve.

Throughout my service on the Commission on Tests, I have become aware that testing in the College Entrance Examination Board occurs within infrequently examined restraints. One of these is that the test theory necessary for purposes of the Board is fully developed and hence unmodifiable. Another is that the mission of the Board is to illuminate *selection* of applicants to *college*. Members of the Commission have questioned both of these restraints in several ways, as the briefs in this report attest, but further deep consideration of them will in the future be required of many others before a sharp, effective, and inexpensive response will become possible (if indeed it really is possible).

1. Principal Investigators of the ISVD are: Russell Davis, Richard Durstine, Allan Ellis, Wallace Fletcher, Edward Landy, Robert O'Hara (Executive Director), and David Tiedeman (Chairman).

Attacking the Question

By seriously addressing the question, "Can a machine admit an applicant to continuing education?" I believe it is possible to understand and describe a considerable break with the tradition of testing, a break that I think the College Board should consider undertaking. It is my view that the Board has done as well as it can under the present theory of testing, which it and Educational Testing Service had a considerable hand in both shaping and using, and that new theory is necessary if a truly improved Board admissions program is to emerge. My purpose is to sketch one approach to a new theory.

I am using the word "machine" in this paper rather than "computer," because although I want to suggest that a new theory can emerge from the planning and implementation of a sophisticated real-time interactive computer system, I also want to deal only with making a procedure, not necessarily with making that procedure operate in a computer without other aids or human response. Thus, for my purposes, a statement of a procedure will also in effect describe the machine needed to carry it out. There need be no existing machine capable of carrying out every stated procedure. Nevertheless, a computer actually happens to be one form of a machine that makes concern for my question interesting. Computer programs define procedures that the computer is to execute and thereby make the computer become one machine after another. Such procedures can be directly written by applicants themselves as well as by psychologists and computer programers.

It might be suggested that the machine I am proposing could actually be an admissions officer, or that it could be proceduralized to act like an admissions officer. I exclude both these possibilities because I want a machine that needs only to achieve stated ends, not to be various people and thereby bring along unnecessary ends and means; and I want one unencumbered by needless admissions acts now performed by admissions officers

and one able to do different things from those now done by them.

The machine I am proposing should be proceduralized so that the ends of the admissions officer and the ends of the machine are identical. It is not necessary that the means of the admissions officer and of the machine be identical, although there is also no reason to avoid making their means alike when doing so does not needlessly encumber the machine.

Purpose of Admission to Continuing Education

We in the Commission on Tests have never settled on what we believe to be the purpose for admission to continuation of education, but my argument here demands that I propose a purpose. I therefore suggest that the purpose of admission to continuation of education should be the acceptance of candidates likely to prove satisfying to the goals of the institution, and the rejection of all others. Education should be thought of as continuous for each individual, although it may well still have to be provided in more than one institution and thus be satisfying to more than one set of goals.

Education should be satisfy*ing*, not merely satisfac*tory*. Thus I include in the purpose of admission the necessity for the applicant himself to become satisfied with his education while he is being educated. I am implying (1) that admissions officers cannot be satisfied merely that their admitted candidates are satisfactory upon admission, and (2) that the symmetry necessarily implied in educational satisfaction requires both that the applicant become satisfied during his admission and during his education when he becomes a student and that the institution, as resource for enlargement of the student's intelligence, be satisfied throughout the applicant's admission and later education. Coleman has given the Commission on Tests the concept of symmetry. He elected in his brief (see page 19) to apply the concept only to the evident asymmetry in control of the admissions pro-

cedure. I make reference to the same concept but extend it into education as well.

If continuation of education at any given instant is to prove satisfying to the goals of the institution admitting the applicant as specified, admitted candidates who by then are students must themselves set goals for the institution. Students who do so give the institution chance of viable existence. Students who live by personal goals at admission assume obligation during their education to live both by and with the institution's goals as well. As Commission members Friedenberg, Gordon, Hersey, and Schlossberg have argued in the Commission, in living *with* the goals of an institution, students become the critics of those goals and thereby offer the institution opportunity for its perpetual change—and probably its improvement as well.

Self-Correction and the Satisfying Continuation of Education

As Coleman proposes that applicants and institutions govern themselves in the admissions process, so do I propose that institutions and the students they are educating will prove most satisfying to institutional goals if both are subject to expectations and to procedures for self-correction.[2] The basic personal process of self-correction is creation: something comes into a person's being that was not earlier articulable although it may well have already existed tacitly for quite a while. Ideational creativity, the goal of education, requires a student to relate himself to his experience and his environment so that he is tentative about some things and from time to time commits himself to other things. These vacillating dual conditions of tentativeness and commitment permit the mind to play with ideas both as wholes and as parts. The wholeness of an idea allows one to deal in theory with

2. Gannaway, Myra T., *Changing Perspectives in Education and Self-Correcting Thinking*. Cambridge, Mass.: Harvard Graduate School of Education, 1968. Unpublished qualifying paper.

its conceptually divided parts. In dealing with its parts one can experience ideational aspects of a totality in intensity necessary for comprehension of the totality. Frequently the whole suggests parts not yet envisioned. Occasionally parts coalesce into wholes as yet unimagined. However, self-correction is itself experienced as a whole, although its emergence can be encouraged by dealing with some of its contributing parts.

Maintaining a sense of self-correction makes demands on applicant and institution alike. For the institution's part, (1) a significant number of its officers must be capable of self-correction, and (2) the organization of the institution must not contradict the expectation for self-correcting activity on the part of such enlightened officers. Coleman, Cross, Friedenberg, and Hersey are among Commission members who have advocated this institutional condition in continuing education. For his part, the applicant, as Friedenberg argues (see page 33), (1) must be given opportunity to share in goal determination of the institution even at the time of his admission, (2) must perceive this opportunity as fairly offered and fairly administered, and (3) must be capable of self-correction when he is admitted and throughout his education in the institution.

Science and Self-Correction. Self-correction is an attitude fundamental to science, including of course psychometrics, as well as to personal development. I can further elaborate my meaning of self-correction in personal development through consideration of the more commonly understood principles of science. I am referring to the process of science, not necessarily to the products of scientists. Comprehension by the scientist is the end product of the process of science, and this comprehension ordinarily implies successive differentiation of the concepts involved. Personal development requires comprehension of the processes of science as well.

All of us engage in informal testing intermittently in daily living whether we are scientists or not. Through such informal testing we sharpen in self-correcting ways our understanding of

the relationship between ourselves and our experience and environment. Scientists formalize such thought, or tests in which they are willing to think one way or another depending on the outcome of an observation contingent upon a prior supposition, and call it "doing science." Scientists "do science" with concepts they have formed about the relationships among themselves, their concept, and the experience they are attempting to understand by means of their concept. This idea about science is not novel. Polanyi relies on it.[3] Bronowski explicitly grounds the identity of man in it,[4] as I am suggesting be done here.

The primary paradigm I am proposing for self-correction in personal development by "doing science" is that every man seeks clarification of the relationship between an idea he has and his experience (including others' summaries of that experience). He thus brings his ideas into focal awareness in the ground of his and others' experience. If power is expected from this primary relationship he must study it in a secondary relationship in which he sees himself both as the inventor and evaluator of the idea and as the agent of his experience.

Actually it is impossible to separate these primary and secondary relationships; one continually interacts with the other. It is therefore necessary to conceive the two as figure and ground in phenomenological interaction. What ordinarily eventually happens when *comprehension* takes place is that concept and experience are given primary position as figure, within the ground of the "I-and-concept" relationship. The processes by which ideas are related to experience occur normally. However, it is possible for individuals to become much more aware of them, and for that awareness to sharpen decision-making activity, par-

3. Polanyi, Michael, *The Tacit Dimension*. Garden City, N.Y.: Doubleday and Co., Inc., 1966.

4. Bronowski, Jacob, *The Identity of Man*. Garden City, N.Y.: The Natural History Press, 1965.

ticularly personal responsibility for decisions. As Carroll has suggested to the Commission on Tests, comprehension of the process itself matures very slowly in man's cognitive development. It may well occur at different rates at different times in different people's lives as Carroll, Gordon, Holtzman, Pace, and Schlossberg have contended in the Commission. I mean to say only that the effect *can* be helped to occur sporadically throughout life. Commission members Gordon, Hersey, Hoy, and Schlossberg seem to hold a similar belief. Comprehension of the general element of the process occurs even more slowly, but there is a good deal of evidence that it is indeed a capacity man can develop.

Formal testing differs importantly from informal testing in that formal testing must be conceived in public terms and informal testing can occur largely in private terms.

"*Doing Science*" *and Formal Testing.* The scientist tries to bring into the public realm the understanding he achieves as a result of informal tests of his concepts and experience. As he makes this move from the private to the public realm, he finds himself explaining not only what he knows but also the bases upon which he claims to know it. These bases, as they enter the public realm, become the material others can use to examine the scientist's impression of what he understands. In the pursuit of science, the bases occasionally become formalized and serve as tests that other people in turn apply to the relationship between concept and experience that the scientist claims he understands. As this process occurs, investigations that were formerly "fluid" in Schwab's language[5] or "whole" in my language of self-correction become "static" in Schwab's language or "partial" in my language of self-correction.

In static or partial investigations, the bases of understanding are kept fixed while the realms of application of those bases are

5. Schwab, Joseph, *The Teaching of Science as Enquiry.* Cambridge, Mass.: Harvard University Press, 1962.

varied. Static investigations therefore ordinarily expand and clarify just the limits of application of an original understanding. Fluid or whole ideation, on the other hand, is ordinarily relatively free of the restraints placed on static investigations. Such freeing in turn allows concepts and experiences to be "seen" and presented in new lights. When the freeing is a superordination of previous restraints, science or persons are said to progress. When the freeing is the establishment of new restraints but in a different field of awareness, science or persons are said to become diversified.

Means and Ends. My argument so far first noted that the purpose of admission to continuing education should be the acceptance of candidates likely to prove satisfying to the goals of the institution and the rejection of all others. I then argued that the sense of self-correction must be preserved if students are to achieve a continuation of education satisfying to applicant and institution alike. I finally noted that awareness of doing science in personal living, particularly the doing of formal testing in science, is the aspect of self-correction critical to a satisfying education.

I next want to point out the existence of a fundamental flaw between the way tests are now being used in admission to continuing education and the end of cultivating self-correcting activity. The flaw is that applicants are not collaboratively involved by admissions officers in the problem of specifying goals and pursuing them. Tests by themselves offer no present opportunity to correct that situation, and it is this flaw that the admissions machine specified in this brief would seek to eliminate.

An Admissions Machine

If the sense of self-correction I have defined here is not to be seriously contradicted during admission to continuing education, that admission should be carried out as an integral part of the emerging self-determined and self-corrected career, a particular

aspect of self-development. The cultivation of the awareness of doing science, particularly the awareness of doing formal testing, in living can be achieved during admission if the needed admissions machine is planned as a part of a career machine. One career machine is now under specification and partial construction as an Information System for Vocational Decisions (ISVD).

Role of the Career Machine. In an ISVD, a relationship is arranged between an inquirer and certain facts. In my particular ISVD, facts are of four kinds: (1) occupation; (2) military service; (3) education; and (4) personal and family living. The ISVD expects the inquirer to turn facts and data into information. The turning of facts and data into information is cultivated by four machine functions. Each of the first three—exploration, clarification, and planning—is in the anticipation phase of the Tiedeman and O'Hara paradigm of decision-making development.[6] The fourth function, review, is in the accommodation phase of that paradigm. The expectation that facts and data will be turned into information is in turn supervised or monitored by the machine. The monitoring is governed by the assumption that the person will become self-correcting in his use of these functions. The principal goal of that self-correction is the mastery of the paradigm of decision-making development. The comprehension of this epigenetic phenomenon of decision-making development is the end product expected of repetitive use of an ISVD. The comprehension probably occurs developmentally in ways as yet unknown, but it undoubtedly occurs over an extended period, probably the period of the life itself.

The major condition potentially leading to the comprehension of decision-making development is the monitoring function just mentioned. The monitoring function is programed to detect and report occurrences in which the inquirer is seemingly pro-

6. Tiedeman, David V., and O'Hara, Robert P., *Career Development: Choice and Adjustment.* Research Monograph No. 3. New York: College Entrance Examination Board, 1963.

jecting extraneous information at times when the system expects him to assume responsibility for his activity and understanding during exploration, clarification, planning, and review about the current, past, and likely future points of decision in his career development. The inquirer will be able to ask for the basis of the system's judgments at any time. The system will be programed to report those bases and to invite the inquirer to modify them if he is so inclined. The modification can be accomplished by having the inquirer program the computer himself for solutions to problems he defines. This procedure will make the ISVD "reveal itself," or at least its procedures, a condition Ellis and I declare to be the major object in counseling.[7] Should the inquirer act on the machine's invitation to modify the bases for system monitoring of his own interaction, he begins the construction of a personal or truly esoteric information system. The degree to which the inquirer can either extend or change the public monitoring function represents the degree to which he can plumb his intuitions and make them articulate using the ways of expression delineated by the system. The inquirer is thereby helped to make his tacit understandings explicit, at least to himself, and probably to others should he elect to do so.

The assumption and practice of responsibility for monitoring one's activity while inquiring cause understanding of a particular decision-making development. The comprehension of the way in which one is interacting with the system to get such an understanding is the epigenetic process of decision-making development. When this experience occurs frequently, the inquirer becomes explicitly its master, and in reality thereby becomes master of his *self.*

The ISVD system will use the Tiedeman and O'Hara para-

7. Ellis, Allan B., and Tiedeman, David V., *Can a Machine Counsel?* Project Report Number 17. Cambridge, Mass.: Harvard Graduate School of Education, Information System for Vocational Decisions, 1968. Multilithed.

digm of decision-making in vocational development as an explicit model that inquirers will be expected to master through repeated use of the ISVD. More important, through interaction with the system and with counselors who are aware of and attempting to facilitate the more general effect, inquirers are expected to master the epigenetic process of decision-making development. Inquirers having such mastery are skilled in the use of purposeful action,[8] of self-correction,[9] and of "doing science" or reasoning either in the sciences themselves or in the humanities as well.

The Admissions Machine in Broad Outline. The existence of an ISVD career machine would simplify the admissions process if applicant and admissions officer both believed that the other was self-correcting and, as Coleman advocates in his brief (see page 19), mutually decided to share facts and data in order to collaborate in deciding whether this particular applicant should be admitted to this particular institution or not. The prior uses that the inquirer had made of an ISVD would give him a means of now characterizing his decision to apply to a particular institution so that the admissions officer could, with the inquirer's permission, be privy to how he had made his decisions, not just to the fact that he now wanted to be admitted. The admissions officer could examine this record for detail, complexity, integrity, and self-correcting activity. He could also plumb the record for the goals the applicant wanted to fulfill and for the applicant's justification that such goals could be fulfilled collaboratively at the particular institution with its present stated goals and existing procedures for self-correction of these goals. Final evaluation would remain in the hands of the admissions officer, as it must be.

The self-correcting processes that Bronowski[10] and Ganna-

8. Field, Frank L., *On the Concept of Purpose.* Santa Barbara, Calif.: University of California at Santa Barbara, 1968. Typewritten.

9. Gannaway, *op. cit.*

10. *op. cit.*

way[11] define depend on the individual's capacity to examine honestly and continually the relationship of himself to his experience. When an individual is doing so he is in reality acting as a scientist about his self-processes. I believe that the major issues in such an examination at the time of application to continuing education are (1) the nature of the outside as that outside is known to others, and (2) the nature of purpose[12] as its nature can be known collaboratively to applicant and admissions officer alike. In order to facilitate and demonstrate these conditions the admissions machine should contain an admissions game that can be used by an applicant first in familiarizing himself with another's experience about admission to continuing education and then in showing a particular officer how he used that game in his personal decision. The admissions game would constitute a giant step in helping applicants maintain individual initiative within a sense of understanding of institutional complexity, a condition Coleman has urged the Commission on Tests to try to bring about.

A further widening and deepening of the context for collaborative testing action between applicant and admissions officer can help both to move the admissions decision from its present base, which is almost gamelike, to a more intimate base in which the aspirations and evaluations of applicant and admissions officer are more penetratingly known to both. The instrument for such widening and deepening can be a computer-based interactive admissions system, or an admissions machine. In such systems, an admissions officer can combine both the admissions game and his subsidiary decisions. The embedding of game and decision bases into an interactive information exchange, which permits some applicant programing, would naturally expand the area of application of the admissions officer's thought about applicants and their intentions and accomplishments. The use of such an exten-

11. *op. cit.*

12. Field, *op. cit.*

sive system would give applicants a sense of participation in admission to their continuing education, which standardized testing does not now make possible.

Implications of an Admissions Machine for Test Theory and Practice

Although the admissions officer would gain from the availability of an ISVD-like self-correcting record of an applicant's career, there will undoubtedly be additional information he would like to have, certain kinds of factual information as well as test information. I shall not say more about needed factual information because it is likely to be specific to an institution and should be planned and obtained with that expectation in mind. However, the problem of testing itself is the principal interest of the Commission on Tests, and it can be treated much more thoroughly in relation to a potential admissions machine.

The Process of Science and Admissions Testing. The process of science contributes in two ways to admissions testing. First it forms a means of showing what admissions testing now is. Second it suggests a model of what admissions testing might become.

Admissions testing now takes place under static conditions. For all practical purposes, psychometricians conceive admissions testing merely as an instrument an institution can use to find the applicants it wants by comparing them with classes of the years past. As Thresher has indicated in his brief for this report (page 146), the present procedure of formal admissions testing thus constitutes only a feed*back* loop—that is, the criterion is fixed and the test and associated admissions studies provide probability data in relation to the fixed criterion. A feedback system is static as far as its restraints are concerned. One of the ways in which a feedback system has been moved toward a dynamic or more fluid condition, in which feed*forward* then starts to be available, has been to use the results of feedback obtained within existing constraints to make the feedback operate to correct the direction in

which an object is moving. This is the sense in which feedback operates in missile guidance systems, in power steering of automobiles, and the like. This is also the sense in which psychometricians now construe guidance as based in existing test theory.

If the planning function of my ISVD-like career machine were constructed and used as an admissions game in an admissions machine, the Board would create a first movement from a static test system to a dynamic information-creating system. Although the static system of college admissions based in present Board tests is for the most part deterministic, the effects of some of that determinism could be somewhat alleviated in the students subject to it by causing them to comprehend the "theory of the admissions game," as well as to take tests processed in secret by admissions officers. This is equivalent to the takeover of the public monitor by the inquirer in the ISVD career machine. Students who become expert in such a game are more likely to petition for admission to continuing education on grounds that allow them to act a little more intuitively within both the restraints of the present "game" and the operation of those restraints on their desires.

Widening the Data Context in Formal Testing. It is now possible to widen the context of data processed by admissions officers without sacrifice of either accuracy or accountability. One form of widening would be to incorporate the patterns resulting from modularly arranged programed instruction, as Commission members Coleman, Holtzman, and Suppes have suggested. A second form of widening can be accomplished by shifting the basis of existing Board questions from multiple response to free response as Thresher suggests in his brief (see page 146). This alternative has not in the past been fully exploited because it has been said that it takes too long to process answers in the short turn-around time between receipt of answers and need for processed results and that it is impossible to get readers to agree on evaluations of responses.

As to the feasibility of processing free-response tests effici-

ently, the availability of computers now makes it possible to process in short order a response entered into the computer by an applicant. In fact, the computer can convey its response to the applicant himself as well as to any other party permitted access to the question-response sequence. Thus the matter of time becomes irrelevant if testing is programed so that questioning, answering, and processing are done almost simultaneously. This effect is already available through systems software permitting students to learn by problem-forming.

As to the second objection, regarding the reliability of evaluating such free-response questions: Stone and his associates have developed a procedure for computer recognition and response to key words in context.[13] Fred Ferris picked up this processing idea and exploited it in relation to providing items on Board tests that can be presented as problems, not as a given set of possibilities from which a selection is made.[14] Probably there are others as well, but I do not know of their work at this time. This procedure markedly changes the nature of test content, as Ferris discovered in his exploratory work. It isn't possible just to take old questions and expect answers in new forms; the forms of the questions must be changed as well.

If the processing of key words in context is done while the applicant is interacting with computer programs, further gains become possible. These further gains as already achieved by Commission member Suppes in his concept-forming instruction are: (1) the responses identified by the computer can be relayed to the applicant before he leaves the system, and (2) the applicant can be asked to verify or revise such identifications before he leaves the system. The applicant's revisions can in turn be made a matter of record and report to the admissions officer.

13. Stone, Philip J.; Dunphy, Dexter C.; Smith, Marshall S.; Ogilvie, Daniel M., *The General Inquirer: A Computer Approach to Content Analysis.* Cambridge, Mass.: M.I.T. Press, 1966.

14. Personal communication.

This procedure therefore bypasses one of the major problems of reliability, namely keeping the process sensitive to what the applicant intended. An additional gain as preliminarily modeled by Ferris is that the computer program can also report to the applicant the test-maker's judgment of the complexity and completeness or accuracy of his answer. This is the new form of reporting that Thresher advocates in his brief (page 146), not just a reporting that merely gives the correctness or incorrectness of a response. I am thinking of a response processed according to the numerous alternatives for tackling a problem. The test-maker provides scoring of the response in outside terms and then uses that outside scheme both to score the response in his terms and to share the report of such scoring with the applicant. If the applicant notices anything awry with his score, he can report such impressions. This eliminates another issue in reliability.

The major reliability issue in test theory has to do with (1) the limited number of questions—the sampling—included in any one test, and (2) the assessment of the possibility that the level of a person's score on a sample of test items will remain relatively constant in relation to the scores of comparison groups tested with different items. Limiting subject-matter coverage in a given test by sampling is indefensible. It may prove valid with a few things like sets of arithmetical operations, but in a real sense each question is a unique question. When different questions are placed in sets, their categorization can be challenged by anyone who knows the subject. In test-construction committees at the Board, placement of questions in categories is ordinarily done consensually, after discussion, not individually. However, the placement of questions into tests is a serious problem that probably shouldn't be delegated by admissions officers to test committees. Are there ways in which admissions officers can deal with such decisions themselves? There prove to be ways when the selection of questions for answers is left to the applicant and when the entire set of questions from which the applicant can draw is known to the admissions officer. If an applicant is allowed

to respond to questions in computer programs and if the processing of responses is arranged as I have noted above, then the record of response transmitted to the admissions officers can be not only the applicant's processed answer to a problem (complexity, completeness, accuracy) but also general statements (in the particular admissions officer's own terms, should he desire such a report) of what categories of questions were attempted and what categories of questions were not attempted.

But how then could an admissions officer compare one applicant with another? Coleman contends that this is the major question for an admissions officer faced with selecting a limited number of applicants. when he reviews a set of applicants' test responses. The psychometrician's habit of doing a lot of the deciding for an admissions officer is no longer necessary. It is now possible to put before admissions officers themselves both data on the applicant's choice processes, with histories of the admissions officer's decisions about prior candidates, and much of the data on which the Board's test committees act themselves. It is additionally possible to get information to an admissions officer before he is required to act on it, in a form in which it has been previously dealt with by each of the applicants to his institution. Hence he would have an opportunity to form his impressions of each applicant both by reviewing information about him individually and by comparing him with other applicants. Furthermore, for admissions officers who want such help, it would be possible to work out computer programs partially summarizing whatever information an admissions officer might designate that is available in the content of a test. Doing so would preserve the Board's traditional value of providing valid and condensed information for quick action. It might also provide the public means both to monitor decision-making processes of admissions officers and to accumulate data for C. Robert Pace's College & University Environment Scales and James Coleman's Admission Game.

Determining Goals in Self-Correcting Institutions. Institutions

pursue their own objectives on the premise that their use of students who are their human resources actually benefits society. Their goals and the judgments on which they are advanced, however, are currently subject to serious questioning by students. I don't mean to favor one person's goals over another's. But I do argue the applicant's right to make an institution aware of his intended use of it, as well as the reverse. The young individual must come to know that his society is in him as well as he in it. As Coleman indicates in his brief (page 19), this sense of being an individual is not readily come by in large modern organizations. At the present time young people are kept in educational navigational systems for a long time and then released to personal navigational systems with little or no effort to cultivate what this shift entails. I know that this assertion is subject to debate. Nevertheless I make it in company with Commission members Gordon and Schlossberg on the grounds both of the limitations of modern educational guidance and of the inadequacies of the theory on which it is based.

If the Board is to improve the theory on which guidance operates, it will have to become involved in the basic substance of guidance, namely the self. Gordon, Schlossberg, and I do not use the concept "self" loosely. We are aware of its history in metaphysics, and we too find it mercurial. For discussion here I am using Bronowski's definition,[15] and therefore I am talking about the *grounds* that are available to personal awareness. I merely extend Bronowski's belief into my own that comprehension of the processes by which that availability occurs can be facilitated.

I believe that self-awareness deepens and widens with the comprehension of the processes of choosing. Admission to continuing education is one context for choice. In this context, the applicant is required to place what he knows in juxtaposition with what he wants. He is then in a position to advance what he

15. *Op. cit.*

wants in terms of what he knows, using the resources of an institution of continuing education as a means for his intention and plan. If the admissions officer is to have sufficient inkling of an applicant's intention and plan, he must have a context in which what the applicant knows can be advanced to him in relation to what the applicant wants. This pair of conditions becomes possible in a computer-based interactive exchange system such as the career machine. It would be better grounded if it originated from free responses to problems, as I have advocated for the admissions machine, but free response is still not enough. What the admissions officer should additionally seek is information concerning the applicant's ability to form problems, not just to solve them. If an applicant can only solve problems, he tends to know and interact with the world largely in another's terms, not his own, but if he is able to form problems, he is able to react to the world in his own terms as well as in another's. If the admissions officer watches the extent to which an applicant includes the views and purposes of others and advances his own purposes, he can learn a lot about how the applicant accomplishes goals and uses information.

Conclusions

I posed my question "Can a machine admit an applicant to continuing education?" without expecting that it could be answered affirmatively. Instead I merely proposed that it be taken seriously in order to gain new perspective on the theory and practice of testing. In attempting to create this perspective I defined my purpose of an institution of higher education in its admission process as the identification of applicants likely to prove satisfying to the goals of the institution. I then proposed that that purpose be expanded to incorporate the goal of self-correction and the procedures of science as means compatible with achievement of that goal.

Having proposed a new purpose for admission to the con-

tinuation of education, I outlined an admissions machine consistent with its attainment. I finally used the admissions machine to adumbrate the assumptions of formal testing in order to pinpoint assumptions in the theory of testing that can be changed as the practice of admissions embraces the concept of an admissions machine.

What I propose as necessary will be difficult to accomplish. As do Commission members Friedenberg, Gordon, Hersey, Hoy, and Schlossberg, I essentially suggest that the major purpose of education is to help persons clarify their own relationship to language and experience. Admission to continuing education must be consistent with that purpose and thus should be offered in expectation of self-correcting activity on the part of an applicant and in an atmosphere in which the applicant will agree that such has fairly been the case.

My proposals challenge cherished assumptions in testing and in admission to continuing education, two activities that I have come to know as relatively inseparable at the present time. Testing theory is largely defined in terms of admissions purposes; admissions practices largely follow test theory. The concept of a machine has been my principal means of being explicit and of proposing how my ideal is within realization. Not only do I make no claim that what I propose will be easy to attain; I do not even make a claim that a machine *can* admit an applicant to continuing education. However, I do claim that examination of the question as if it had an affirmative answer has offered a new way to question fundamental purposes and means in the college admissions process. To fail either to question in the terms here advanced or to act on new premises will be to abandon present institutions of higher education to new institutions in which the self-correcting activity now being sought by college students will find more friendly haven.

Recommendations

Pearson's brief (page 100) outlines a way in which the Commission on Tests recommends that the College Board bring computer technology into programs that for the most part already exist. His proposal is based on assessment of the state of computer technology and on full knowledge of the way in which the Board ordinarily changes its approach. Unfortunately there is no experience to assess in the construction and implementation of an admissions machine, but there are numerous parts that could be assembled and experimented with before attempting to engineer the whole machine: (1) materials in a number of the current Board financial, guidance, and test programs; (2) modularly arranged programed instructional material such as Commission member Holtzman advocates and Commission member Suppes has already produced; (3) laboratory instruction via computer as was outlined in Holtzman's computer conference; (4) the test-item files at ETS and reported experimentation with individually tailored tests; (5) concept-formation teaching programs such as Suppes has constructed, others have elaborated, and several people adumbrated at Holtzman's computer conference; (6) the valuing procedure Martin Katz is constructing at ETS for computer aid in bringing values into focal attention during educational and vocational deciding; (7) the ISVD; and (8) Pearson's advice about bringing educational technology into Board programs.

However, merely assembling these parts will not create a feasible, efficient, and economic system that will markedly change the character of, procedures in, and probable satisfaction with admission to continuing education. These results will only come with intimate, prolonged, and careful systems design and construction by admissions and computer experts working collaboratively.

It is recommended that the College Entrance Examination Board:

1. Establish a small study group that will outline an admissions machine and undertake feasibility studies needed to reach within two years:

a. a better grounded decision on the further possibility of developing an admissions machine;

b. if then still considered possible, a more detailed financial and structural plan for implementing what appear to be better lines of its development.

(2) In appointing this study group, recognize that its report within two years will bear serious financial implications for the Board.

Record of Endorsement, Comment, Reservation, and Dissent on the Recommendations in *Can a Machine Admit an Applicant to Continuing Education?*

It is recommended that the College Entrance Examination Board:

1. Establish a small study group that will outline an admissions machine and undertake feasibility studies needed to reach within two years:

a. a better-grounded decision on the further possibility of developing an admissions machine;

b. if then still considered possible, a more detailed financial and structural plan for implementing what appear to be better lines of its development.

Endorsed by 16 members: Blocker, Carroll, Coleman, Foster, Friedenberg, Gordon, Hechinger, Hersey, Holtzman, Hoy, Marland, Pace, Pearson, Schlossberg, Thresher, Tiedeman.

Carroll: "My only reservation is that the proposed 'admissions machine' may actually be partially redundant with some

other proposals. Also, I do not like the implications of calling it an 'admissions machine.' Some other phrase would be more graceful."

Foster: "Depending on the cost. But I doubt if it makes sense until a career-college machine is further perfected—either one like Tiedeman's ISVD at Harvard or Katz's SIGI at ETS. Perhaps this *is* Tiedeman's suggestion."

Gordon: "I have some concern about the name 'admissions machine.' I think Tiedeman is talking about a 'continuing education decision assistance machine'—a long title but more accurate than 'admissions machine.' The machine does not admit."

Not endorsed by 2 members: Prentice, Shirley.

1 member abstained: Abelson.

2. In appointing this study group, recognize that its report within two years will bear serious financial implications for the Board.

Endorsed by 13 members: Blocker, Carroll, Coleman, Gordon, Hersey, Holtzman. Hoy, Marland, Pace, Pearson, Schlossberg, Thresher, Tiedeman.

Coleman: "This should be combined with Recommendation 1."

Not endorsed by 4 members: Foster, Friedenberg, Hechinger, Shirley.

Foster: "Why? Not necessarily."

Hechinger: "In not endorsing this recommendation, I merely want to note that the research indicated does not imply a commitment to develop the machine unless the findings are compelling."

2 members abstained: Abelson, Prentice.

General Comments

Coleman: "I believe the principal emphasis of any interactive procedures designed to aid the matching between college and applicant should be toward providing the kind of possibilities for applicants described in Hersey's brief. I believe the procedures recommended for study in the present brief do tend in this direction, and as a consequence I favor such a study. But I believe the implementation of this brief's recommendations and the Hersey recommendations would necessarily be joint, since the overlap is great."

Foster: "A most stimulating idea. Applying these principles rather than actually building the machine might elicit most of the new ideas for admissions procedure. One wonders if, given the concepts of improved approach provided here, the amount of money (should it be available) necessary to carry Tiedeman's suggestions into operation might be equally effective if used to improve person-to-person guidance. I cannot accept the impossibility or diseconomy of training *people* to help perform these functions in a way satisfying to the student."

Holtzman: "I have mixed feelings about this, but, on balance, I think some statement having to do with computer-assisted guidance and college admission is a good idea to pursue further with a study group."

Marland: "While I support this brief in its conceptual context as feasibility study only, I have very serious reservations about the ultimate procedure."

Prentice: "Unless and until the research and conceptualization underlying ISVD develop beyond their present stage, I would consider this proposal as risking a long expensive journey down a blind alley. It is a fit subject for Harvard's Graduate School of Education, not for the Board at present."

Shirley: "I do not endorse these recommendations primarily because they are using the College Board as a sponsor of research rather than realizing that its first responsibility is operational.

The costs anticipated are unrealistic and would absorb the full budget and staff of the Board. The ultimate development would be beyond the capacity of either the students or the Board membership to absorb.

"Refer to my comments on the recommendations of both Hersey and Pearson. In all these cases of symmetry, I am sympathetic to the idealism involved but realistic enough to know that the Board does not have and probably cannot get the support that will make possible the translation from dream to reality. As this is the case, the Board should be a facilitator of the translation process; it should not be asked to subsume it.

"Our recommendation to the Board should be that it recognize the need for this kind of symmetry and use its influence and good offices to (a) get financial assistance—from a foundation or government—to do the research and to make the background studies needed to develop the plans for the major programs and (b) bring the full force of the association membership to bear on government (the only agency that could fund such a venture) to give it full support. But the Board must not accept responsibility to do what is patently impossible at the outset.

"I must add that I'm intensely skeptical of the computer approach. The Harvard demonstration showed that the first steps are tremendously costly and exceedingly halting, even under ideal conditions. Considering the magnitude of the problems of gathering data of the kind needed from 2,000 or more autonomous colleges and universities and from X million high school students and their families, updating these data to keep the information current and useful, programing everything to make it accessible to every student, even assuring access to compatible computers to all these students — this makes the task of training more than 100,000 excellent counselors, fully informed of all education requirements and developments in the nation and the full psychological needs of individual adolescents, seem to be a simpler and easier solution to a difficult problem. Have we considered all alternatives to symmetry? I fear we have not."

Thresher: "I urge that the project be moved into the stage of reasonably large-scale involvement with actual students as soon as possible. At present it has more anatomy than physiology, more bones than flesh."

Recommendations Proposed in Commission Members' Briefs

It is recommended that the College Entrance Examination Board:

1.1 Propose to an organization such as the American Council on Education that it create a Council on College Admissions and Scholarship Testing that would invite the various testing organizations and agencies to join for the purpose of cooperating in research that would lead to mutual agreements among themselves and the higher-education institutions concerned, whereby colleges would accept scores on different tests as equivalent for admissions purposes.

1.2 Propose that the research and development to be sponsored by this council be based on a method of establishing equivalencies in terms of equivalent predictions of criterion variables.

(Proposed by John B. Carroll in "Redundant Testing")

2.1 Support research to investigate the feasibility of recasting the SAT along the following lines:

a. Provision of a section or sections more clearly emphasizing developed verbal skills relating to language comprehension and learning from language, with the reasoning component de-emphasized;

b. Provision of a section or sections more clearly emphasizing ability in reasoning and inference that does not depend greatly on verbal skills;

c. De-emphasis of the quantitative sections of the tests, with provision for testing of developed ability in this area in specific achievement tests apart from the SAT;

d. Administration of some parts of the SAT in an auditory mode, to reduce dependence of those parts on reading ability;

e. Provision of a section or sections that would measure scholastic learning capacities or potentials as much as possible apart from developed abilities;

f. Validation of SAT materials not only against overall abso-

lute success in higher education (in various types of programs), but also against gains made in developed abilities.

2.2 Introduce on a gradual basis, if the above types of tests prove feasible and acceptable, a new and possibly renamed SAT, with appropriate dissemination of information about the test both to educational institutions and to candidate populations.

(Proposed by John B. Carroll in "Possible Directions in Which College Entrance Examination Board Tests of Abilities and Learning Capacities Might Be Developed")

3.1 Systematically gather and publish relevant information about colleges, the nature of that information to be determined by a working group including representatives of colleges, students, and high schools.

3.2 Beyond the standardized testing that allows colleges to make direct comparisons of a few characteristics of applicants, provide the applicant with the opportunity, through selection from a very wide variety of special tests ranging in subject from numismatics to algebraic topology, to exhibit his special capabilities, developed in or out of high school, that may be relevant to the colleges' interest in him.

3.3 Provide colleges and applicants with information about the other only if they are willing to allow information about themselves to be made available.

3.4 Modify its governing structure to embody a symmetry of college and applicant interests.

(Proposed by James S. Coleman in "The Principle of Symmetry in College Choice")

4.1 Offer not merely achievement and aptitude tests but also diagnostic tests that would permit colleges and students to select each other with due regard for prospective compatability.

4.2 Offer high school juniors and seniors, or college students intent on transfer or graduate study, the opportunity to take tests for the purpose of obtaining scores, interpretable by reference to national norms in lieu of grades and, if legally possible, in lieu of school attendance.

(Proposed by Edgar Z. Friedenberg in "Can Testing Contribute to the Quest for Community Among Students?")

5.1 Explore possibilities for adding to its quantitative reports on the performance of students, reports descriptive of the patterns of achievement and function derived from the qualitative analysis of existing tests.

5.2 Explore the development of test items and procedures that lend themselves to descriptive and qualitative analyses of cognitive and affective adaptive functions, in addition to wider specific achievements.

5.3 Explore the development of report procedures that convey the qualitative richness of these new tests and procedures to students and institutions in ways that encourage individualized prescriptive educational planning.

5.4 Explore the development of research that will add to understanding of the ways in which more traditional patterns of instruction will need to be modified to make appropriate use of wider ranges and varieties of human talent and adaptation in continuing education.

(Proposed by Edmund W. Gordon in "Toward a Qualitative Approach to Assessment")

6.1 Carry the principle of symmetry to its full realization by establishing as soon as possible a College Entrance Service, the purpose of which would be:

a. To guide applying students to colleges that would fit their needs and abilities;

b. To assist institutions in building student populations that, along with their faculties, would enable them to become communities manifesting their own best possibilities;

c. To supply diagnostic and guidance materials on themselves to individual students;

d. To supply evaluative materials on themselves to colleges.

6.2 To this end to undertake simultaneously both operations and research, using both printed and computerized techniques.

(Proposed by John Hersey in "A College Entrance Service")

7.1 Increase minority-group representation on the College Board staff to a level that more fully reflects the society at large and the commitments already shown by member institutions.

7.2 Change the composition of committee membership to reflect the same pattern.

7.3 Seek to shift the membership of the Board of Trustees in a similar direction.

7.4 Review its present financial commitments and completely analyze available supplementary funds in the area of equal educational opportunity programs, with a view toward a dramatic extension of activity.

(Proposed by John C. Hoy in "Educational Civil Rights and the College Board")

8.1 Take steps to increase greatly the scope of its testing program to include the measurement of student competencies other than those reflected in measures of academic promise for college entrance.

8.2 Undertake initially a major study, including a pilot program to develop appropriate materials and procedures, of the feasibility of assessing qualifications and classifications for job entry and for postsecondary technical training.

8.3 If the results of the study and the experience with the pilot program are promising, consider expanding its function to serve all high school graduates, including those entering the work force directly as well as those planning to go to college, and changing its name accordingly to "Career Entry Examination Program," or such other appropriate name as would accurately reflect its expanded clientele.

(Proposed by Sidney P. Marland in "A Proposal for a Comprehensive System of Testing for Job Entry")

9.1 Support a research and development program to assemble, evaluate, and interpret information about colleges, taking into account the kinds of issues, sources, and technical matters described in this brief.

9.2 Regard this program as contributing, in stages, to the necessary software underlying a computerized information system.

9.3 Present information developed from the program in some printed form to be determined by the College Board, pending its incorporation into a computerized system, so that as much as possible will be available to applicants at the earliest feasible time.

(Proposed by C. Robert Pace in "A Program for Providing Information about Colleges to Applicants")

10.1 Adopt as its principal policy objective in testing the provision of a broad array of tests and other information designed to assist tenth- and eleventh-grade high school students in educational planning and decisions with respect to post-high school opportunities.

10.2 Provide factual and scientifically based information about individual colleges and universities for use by prospective applicants. This information should go beyond that now routinely supplied by institutions of higher education and should include ability and performance expectations for admission and for suc-

cess in particular programs as well as information about the campus environment.

10.3 Make provisions for a series of three to five specialized reporting programs, corresponding to different types of institutions of higher education, for the provision of test results to colleges and universities in connection with institutional decisions about admissions and placement. Further, experimentation should be undertaken with respect to computer storage and retrieval of this information so that it can be made available to the institutions at the time and in the form needed for decisions. Further, standards for protecting the privacy of students should be established so that any test information necessary for students but not appropriate for use in institutional decisions will be reported only to students.

10.4 Be prepared to offer supplementary testing programs for particular groups of colleges and universities and for prospective applicants who may not be enrolled in high school under provisions that would limit redundancy and duplication with the basic program.

10.5 Keep the objectives proposed in this report under continuing policy review and provide adequate empirical research in continuing review in order to assess the extent and timing of the proposed changes.

(Proposed by Richard Pearson in "Education and Testing in a Period of Qualitative Change")

11.1 Establish regional centers for guidance in continuing education.

11.2 Consider as potential programs for these centers:

a. Offering appraisal and advisement services;
b. Developing a system of credit equivalency;
c. Offering courses in guidance for credit;
d. Using new training methods for staff development;

e. Conducting experimentation and research.

11.3 Incorporate student participation into the regional centers and into the Board's national program.

11.4 Change its name and function to "Continuing Education Entrance Board."

(Proposed by Nancy K. Schlossberg, John C. Hoy, and Edmund W. Gordon in "Regional Centers for Guidance in Continuing Education")

12.1 Supplement its present programs with self-administered and self-scored tests, made available to students in great profusion, and accompanied, under various degrees of delayed availability, by reasoned discussions about the choice of an answer for each item.

12.2 Draw teachers, particularly those in secondary schools, into large-scale participation in the production both of these tests, and of tests in the conventional "adversary" mode.

12.3 Stress face or curricular validity in the selection of test items; stress items of teaching merit.

12.4 Invite, experimentally at least, groups of students who have taken a test soon thereafter to participate in an oral discussion of the test under the Board's auspices.

(Proposed by B. Alden Thresher in "A Proposal for Self-Scored, Self-Administered Tests")

13.1 Experiment actively with a system of modular, diagnostic instruments designed to test important competencies; these would, in principle, resemble the present achievement tests.

13.2 Make these available to colleges as a means of permitting greater flexibility in the choice of combinations of tests selected by the student, and required or permitted by the college.

13.3 Continue the Scholastic Aptitude Test for the time being, with such improvements as may be possible.

13.4 Encourage member colleges gradually to replace the Scholastic Aptitude Test with its fixed, predetermined parts or modules, by more flexible assortments of modular tests.

13.5 Reduce the speededness of its tests by reducing the number of items per test, even at the cost of some loss of reliability.

(Proposed by B. Alden Thresher in "Diversification in Educational Assessment")

14.1 Establish a small study group that will outline an admissions machine and undertake feasibility studies needed to reach within two years:

a. A better-grounded decision on the further possibility of developing an admissions machine; and,

b. If then still considered possible, a more detailed financial and structural plan for implementing what appear to be better lines of its development.

14.2 In appointing this study group, recognize that its report within two years will bear serious financial implications for the Board.

(Proposed by David V. Tiedeman in "Can a Machine Admit an Applicant to Continuing Education?")