

## DEVELOPMENT OF THE CANADIAN SCHOLASTIC APTITUDE TEST

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The Canadian Scholastic Aptitude Test (CSAT) for English-speaking students is one of a battery of objectively scorable tests being developed by the Service for Admission to College and University (SACU). CSAT is designed to measure what may be described as the general verbal and mathematical abilities of students in their final year of secondary school. The test is divided into four sections each requiring 30 minutes of administration time. Two sections test verbal ability, one with antonym, verbal analogy and sentence completion items, the other with questions on the content of several short essays dealing with diverse topics. The remaining two sections of the test each contain a heterogeneous collection of mathematical items which assess the examinee's ability to reason numerically, algebraically, or geometrically. In addition to these four sections, CSAT contains a fifth section composed of items being pretested. Performance on this section, which also requires a half-hour of administration time, does not count towards the scores an examinee achieves on the test. The motivation of examinees to perform pretest questions is maintained by concealing their identity in the test.

CSAT was first given in February, 1969, and is presently scheduled for administration once per year. The test is new each year in the sense that it consists of a different set of items drawn from a secure item pool. It should be noted that different forms of CSAT can be made very similar in the sense that each form can be built from items drawn to match similar specifications with respect to type, difficulty and level of discrimination. The specifications are laid down by a test development committee consisting of one member from each Canadian province plus representatives of SACU and of the Ontario Institute for Studies in Education, the institution responsible for item development and test assembly under contract with SACU.

Two "raw" scores are derived for each examinee who takes CSAT, a verbal and a mathematical score. Both scores are obtained from a formula in which a fraction of the number of wrong answers is subtracted from the number of correct answers. The penalty is imposed to discourage random guessing on the test. Examinees are fully informed of the penalty and the rationale underlying its use in a handbook they are given to study several weeks before the administration date. The handbook also contains practice items to make examinees better informed of the nature of CSAT.

For the purpose of reporting on the performance of an examinee both to him and to the universities he designates, raw scores are converted to standard scores. The distribution of standard scores has a mean of 500 and a standard deviation of 100. Thus the effective range of CSAT scores is from 200 to 800.

At this point several questions that are frequently asked with reference to CSAT warrant consideration:

1. Why does Canada need a national university admissions testing program? One answer to this question begins by recognizing two facts of contemporary Canadian education, that it is a matter of provincial responsibility and that control of education is becoming decentralized in important respects. Provincial control of education has resulted in the development of interprovincial differences in secondary school programs. The differences are substantial enough to make difficult any direct and meaningful comparison of records of school achievement from different provinces. Decentralization of control has occurred in some provinces to the extent that the teaching and administrative staff of individual schools have sole responsibility for determining curriculum and evaluating student performance. Consequently, it is often difficult to compare in a meaningful way the school records of applicants from different secondary schools in the same province. National admissions tests, such as CSAT, hold forth the hope of providing universities with a valid basis for comparing applicants from different schools and different provinces.

Another reason for university admissions tests is that they help the universities reach early admission decisions. The policy of admitting some applicants several months before they finish secondary school, subject only to the proviso that they successfully complete secondary school, has been forced on Canadian universities by the practice of provincial governments to finance universities on a formula basis and by the practice of most students to apply to more than one university. Under formula financing, universities typically receive government grants in direct proportion to the number of students they have enrolled. To ensure a full first-year enrolment, thereby ensuring full enrolments in succeeding years and qualifying for maximum government grants, a university will admit students in two phases. Many of the applicants admitted in the first phase will decide ultimately to go elsewhere. When a university knows which applicants are not coming, it is able, in the second phase of admissions, to complete its first-year roster by admitting from the pool of remaining candidates. Inasmuch as the first phase of admissions is made in the absence of a completed secondary school record, universities find it advantageous to have the information provided by valid admissions tests to guide their decision making.

2. Why does CSAT attempt to measure verbal and mathematical ability, nothing more nor less? Our first response to this question is that these abilities seem to represent characteristics of considerable practical and theoretical significance. Over the past 60 years psychologists and educators have found them, either separately or in combination, to correlate moderately well with academic accomplishment of many different types. Moreover, verbal and mathematical ability appear with great consistency in factor-analytic studies of academic achievement. They are central to theories such as Vernon's (1961) on the structure of human abilities. One would expect a good test of verbal and mathematical ability to provide scores with considerable relevance for admissions work.

Another response to the second question focuses on the fact that verbal and mathematical scores are only moderately correlated. This implies that a test like CSAT should provide information about two substantially different aspects of an examinee's capabilities. Consequently, the test should enable university admissions officers to judge applicants in terms of the ability most relevant to their proposed programs. Verbal ability should probably receive more weight in comparing applicants who want to study a language or history. On the other hand, mathematical ability would be expected to receive more weight in comparing applicants for work in mathematics, physics or engineering. More than this, the availability of scores on both abilities should enable admitting institutions to counsel students about the advisability of entering one program of study as opposed to another.

3. Why does Canada require its own test? Why can it not use admissions tests prepared elsewhere? It is true that CSAT is very similar to the Scholastic Aptitude Test (SAT) of the College Entrance Examination Board (CEEB) of the United States. The reason for this is not coincidence. In fact, CEEB has been very generous in its provision of assistance to SACU in initiating CSAT. Moreover, the underlying rationale for the two tests is very similar. These facts notwithstanding, there are points that can be made in support of the development of a Canadian test.

One quite obvious point is that the population of examinees for CSAT differs in some respects from the population for SAT. For example, it appears that in order for the test to be ideally suited to Canadian examinees the mathematical items in CSAT must be somewhat more difficult on the average than the mathematical items in SAT. Also, differences between Canadians and Americans in cultural background and in the use of English means that some questions that would be appropriate for use in one country are inappropriate for use in the other.

Another reason for Canada to build its own university admissions tests is that by so doing it retains control of the specifications for the test. If CSAT should prove to be unsatisfactory in certain respects, given its present specifications, it will be possible to make revisions in an attempt to achieve a better instrument. Such revisions would probably be difficult to have incorporated in a test designed primarily for a United States population.

An additional factor which suggests the need for a Canadian test for English-speaking students is the parallel requirement in Canada for a test for Franco-phone students. Such a test, Test d'aptitude générale aux études post-secondaires (TAGEPS), has been developed by the Institut de recherche pédagogique and was also administered for the first time in 1969. The design of TAGEPS is essentially identical with that of CSAT but the items have been produced and validated independently. In the near future, an attempt will be made to equate scores on CSAT, TAGEPS and SAT.

4. What results have been observed to this point? There has been only one administration of CSAT thus far. The test performed well in the sense that satisfactory estimates of internal consistency reliability were achieved. The coefficients for both the verbal and mathematical scores exceeded .90. Moreover, the distributions of scores were as desired, being unimodal and roughly symmetrical and bell-shaped. Satisfactory discrimination among students across a broad range of ability levels appears to have been achieved in that standard scores extended the full range from 200 to 800. What is relatively unknown at the moment is the predictive validity of CSAT. This cannot be determined satisfactorily until those students who took CSAT in 1969 complete at least their first year of university in 1970. However, some indication of validity is available for a test similar to CSAT which was administered in Ontario in 1967 and 1968. For that test, validity coefficients as high as, or higher than, .60 have been observed for some programs in some Ontario universities. The median validity coefficient across all programs in all Ontario universities was unfortunately considerably smaller, about .30. Thus, it is with an air of wary optimism that we await the initial validity results for CSAT itself.

#### Reference:

Vernon, P.E. The Structure of Human Abilities  
(2nd ed.), Methuen, London, 1961.