

IMPLEMENTATION OF TAILORED TESTING AT THE CIVIL SERVICE COMMISSION

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The Civil Service Commission is moving carefully toward implementation of tailored testing. Apart from the prudence of gradual testing and installation of such a significant technical innovation, tailored testing presents significant budgetary and administrative problems that can be dealt with effectively only over time and with considerable study. We now have the technology to introduce tailored testing for cognitive abilities. What remains from a technical standpoint is to complete development of test question banks and to develop and implement additional improvements made possible by this new technology.

This paper discusses four stages in the implementation of tailored testing at the Civil Service Commission. In the first stage, the written test portion of the Professional and Administrative Career Examination (PACE) will be administered in the tailored version. Next, tailored testing will be extended to other examinations. Third, as latent trait theory is applied to all of the Civil Service Commission tests, a set of ability constructs will be identified that will be comprehensive enough to be useful in most employment settings. Finally, banks of questions testing these constructs will be developed.

Stage 1

In the first stage, a tailored version of the written test portion of the PACE will be administered. The feasibility study described by Segal (1977) calls for an operational tryout of tailored testing in one examining office in the fall of 1978. This experiment is expected to demonstrate the practicality of the method and to identify unanticipated operational problems. If the tryout is successful, full scale implementation of tailored testing for the PACE will be possible by the end of 1980.

To arrive at this point, several steps must be completed:

1. The necessary cathode ray tube units must be obtained and their appropriate distribution determined.
2. Necessary operational software must be developed. Software for presenting test questions and treating candidate responses already exists. What is needed is new software to provide information to candidates, to provide test scores in a form that is compatible with other information used in the examining process, and to

interface appropriately with the scoring and data processing system.

3. Details of test administration procedure must be planned.
4. Necessary announcements and publicity will need to be prepared.
5. A system for monitoring results will need to be developed to assure compatibility with the residual conventional testing, which for logistic reasons will probably continue for some time.

Stage 2

In the second stage of the implementation of computerized tailored testing, the capability for tailored testing will be expanded to other examinations. Additional question banks will be developed and existing banks expanded to reflect the different abilities required for successful performance of non-PACE jobs. Existing question banks have been parameterized on PACE applicant populations. New parameters will need to be developed for other applicant populations, because parameters will differ among groups of varying levels of ability.

Additional software will be developed and the computer network expanded to accommodate the growth of the system. In this stage some desirable modifications in hardware are expected to be identified, not only because experience with PACE administration will show up any deficiencies not previously anticipated, but also because tailored testing will provide a stimulus for development of new kinds of question types which will break the bonds of conventional multiple-choice paper-and-pencil questions. As tailored testing is integrated into the Commission's master system for processing examination data (SCORE, System of Comprehensive Operations for Recruiting and Examining) further software will be needed to achieve instant reporting of test results, automatic updating of eligible registers, speedy preparation of certificates of eligibles for particular job openings, and improved matching of candidates to particular job openings.

Stage 3

The third stage in implementing tailored testing at the Civil Service Commission will be concurrent with and somewhat independent of the second stage. Research will be carried out to identify a comprehensive set of constructs that will enable adequate coverage of most of the cognitive abilities that are relevant to employment testing. Work has already begun to calculate item statistics in accordance with latent trait theory. Eventually, there will be a finite set of constructs identified for each occupation through job analysis. Occupational categories will be established to include occupations with similar ability requirements. This contrasts with the typical classification approach which groups jobs and sets levels in accordance with similarity of duties, scope and complexity of work, responsibility, and other variables now directly related to ability to perform. This work is not specifically dependent on tailored testing but will provide an environment in which tailored testing can be maximally effective.

Stage 4

The fourth stage of implementation will be the construction of item banks for this comprehensive set of constructs and a system for relating item banks to jobs. At present examinations are developed for specific occupations or groups of occupations, which results in some duplication of effort. It also results in conflict for some job-seekers who conceivably might have to take several examinations in order to be sure they were considered for all the jobs which were of potential interest to them. Under the tailored system, an applicant would identify all occupations of interest and be examined for them in the most efficient way. The test then will be tailored both to the occupation and the individual applicant. It will even be possible to identify unique requirements of a specific job within an occupation and reconstitute an eligible register accordingly.

Further Implications of Computerized Testing

When these four stages are complete, tailored testing can be considered to be fully implemented. However, the administration of tailored tests is only the first of many possibilities for applications of a comprehensive system of tailored testing to Federal examining. The uses of employment and other tests have become subject to increasing scrutiny by the courts, by Federal and State enforcement agencies, by the psychological profession, and by the public. The need for comprehensive documentation of validity of tests has never been so intense. In many situations where the application of a particular test or item type is so routine that there is no question of the validity of the measure, critics of testing will nevertheless insist that comprehensive studies must be done. Additionally, and at least equally as important, the determination of the value of an examining program by means of utility analysis requires an estimate of the criterion-related validity of the examination.

Application of a tailored testing system will make available large amounts of data for validity studies as they are needed. Construct validation can be made automatic when the tailoring of item banks to occupations is complete. Criterion-related validity studies can be made more economically feasible by using the network of cathode ray tube terminals to obtain criterion measures from job incumbents and their supervisors without the expense of extensive field trips for data collection.

Applicant data other than test scores may be stored so as to expedite and improve hiring decisions. Evaluations of training and experience can be added to the system, and the pool of talent thus accumulated can be arrayed against existing or projected vacancies. The resulting improvement in job-person match will further improve hiring decisions, with the ultimate result of increased utility through improved performance.

The immediate availability of information will make it possible that an applicant, in one sitting at a video unit, could accomplish the following:

1. Take a test and be informed of performance,
2. Input experience, training and other information to be combined

- with test score,
3. Be listed in appropriate eligible registers,
 4. Receive a list of vacancies for which eligible,
 5. Receive a statement of the probability of being hired, and
 6. Receive further advice about job opportunities.

The immediate availability of information can provide hiring authorities with instant accessibility to the pool of qualified applicants. With the full information available about each applicant, hiring authorities will be able to make better decisions and more timely job offers, thus reducing the rate of declinations of offers and providing a better chance of obtaining the best available talent.

A fully developed system for computerized tailored testing of the abilities necessary to success in Federal jobs will bring about important improvements in every aspect of the process of selecting the most competent workers to fill them. It is for this reason that we look upon computerized tailored testing as the greatest advance in personnel testing since the group test was invented during World War I.

REFERENCE

Segal, H. Operational considerations in implementing tailored testing. Paper presented at the Computerized Adaptive Testing '77 Conference, Minneapolis, July, 1977.