PROJECT TALENT - PROGRESS REPORT

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In Project TALENT, 450,000 students were tested in 1357 schools. Each student was tested for two days and each school filled out approximately 50 pages of questionnaire material regarding its characteristics, activities, guidance program, and counselors. Close to one hundred individual test scores are available for each student. The students also filled out an extensive questionnaire of several hundred items of information about background, aims, experience, aspirations, etc. Several hundred items of information are available about each school. All of these test and school measures will be related eventually to a number of target or goal criterion variables which will be measures of important educational outcomes and life outcomes. A basic goal of the analyses for Project TALENT is to study the interrelationships of these data in order to determine the residual or unique relationships of each test or school variable and each goal criterion variable, with all other test and school variables held constant. While this may be done eventually through curve fitting and the like, the initial approach will be through the basic procedure of multiple-regression analysis. Here, for large numbers of the independent variables (test and school measures) versus a single dependent variable (goal criterion variable) at a time, partial r's and multiple R's together with multiple-regression equations will be computed. Other types of covariance or residual variance analyses will also be done.

Simple zero-order correlations between an independent variable and a dependent goal criterion variable are usually highly deceptive and do not really represent the true unique relationship between a pair of variables. A striking example of this occurred in a study of Naval recruiting. It was found, for the various recruiting areas of the country, that there was a high negative correlation between the proportion of families with TV sets and the recruits obtained from the area per thousand population. However, a multiple-regression analysis showed that there was actually a zero partial correlation between TV sets and recruit productivity. This statistical artifact was a result of TV sets (at that time - 1950) existing mainly in the industrialized areas of the country. There was a true unique relationship between degree of industrialization and recruit productivity. This remained as a strong partial correlation when about 40 variables were analyzed simultaneously, whereas the TV correlation vanished.

It is planned that such multiple-regression analyses will be carried out for groups of 100 to 200 independent variables at a time against a specific goal criterion variable. Such criteria will include graduating from high school, going to college, grades made in high school, grades made in college, the occupation entered, the salary received after N years, whether the student has migrated, how well he likes his occupational choice, the types of courses he takes in college, whether he becomes a scientist, or leader, or delinquent, or something else.

It will be possible to include many questionnaire items as variables in the multiple-regression equations by dichotomizing the questionnaire items when necessary.

Group Comparison Studies

As a first approach in exploring the domain, item analyses will be carried out where means and standard deviations on all variables will be computed for large numbers of special groups such as:

a. Occupational groups
b. Parental occupational groups
c. Regional groups
d. Unusually successful groups (creative)
e. Unusually unsuccessful groups (delinquents, psychiatric cases, etc.)
f. Migrants
g. Types of school
h. Groups with specific attitudes towards business, saving, spending
i. Groups planning military careers

After the first round of item analyses has indicated potential clusterings of the variables' interrelationships, more sophisticated matched group comparisons will be made. Here, means and standard deviations for all variables will be computed for matched groups (groups that are alike in N dimensions but are different in dimension N + 1). Examples:

a. Students alike in sex, grade, region, socio-economic status, high school grades, and total Information Test score but different in planning to attend college (or skipping a grade, failing a grade, wanting to become a scientist, ability to write a paragraph, self-concept, basic values, etc.)

b. Schools alike in type, size, and parental occupation mix, but different in student-teacher ratio (or per pupil expenditure, average teacher salary, number of books in library, whether in a specific experimental curriculum group, age of principal, whether multiple or single track, per cent of teachers who are men, courses offered, etc.)

After the completion of the multi-variate analyses it should be possible to apply more

sophisticated mathematical procedures of the operations research type to the data to maximize and minimize certain functions which will be represented by key goal criterion variables. It might be desired to maximize the average reading score of the graduates of schools. Once the unique relationships between the independent variables and the criterion have been established, as well as the interrelationships of the variables, then it should be possible to determine an optimum mix of school characteristics which would result in maximizing the criterion function. Many of the basic concepts of systems analysis and linear programming might be applicable here once the basic unique interrelationships become known. This could help lead to possible scientific decision making in regard to school problems as suggested by Joseph A. Kershaw and Roland N. McKean, Economics Division, The Rand Corporation, Santa Monica, California, in the May 1960 issue of School Management.

Because of the large size of the sample, the data in Project TALENT collected in the spring of 1960 cannot be fully scored, punched, edited and processed into a master tape before the spring of 1961. However, a random sample of four per cent of all students drawn from all schools was drawn and preliminary analyses were made of it by the 650 computer at the University of Pittsburgh. Because of time limitations the scores were put on tape with only a minimum amount of editing. The primary purpose of the partial analysis of the four per cent sample was to study the problems that will exist in editing fully the data as they are made into a master tape later on. Nevertheless, the results did seem consistent and meaningful, and certain aspects of them may be reportable.

The data were analyzed separately for ninth grade boys and girls and twelfth grade boys and girls. The means and standard deviations were satisfactory from the point of view of psychometric characteristics of the tests. The general level of intercorrelations was satisfyingly high where it was expected to be high and satisfyingly low where it was expected to be low. The pattern of intercorrelations, means, and standard deviations seems quite consistent with the results obtained on the experimental forms of the tests earlier administered to a sample of about 6,000 high school students in the spring of 1959.

Most tests showed considerable difference by grade, as was to be expected. The differences between boys and girls occurred in both directions and formed a meaningful pattern. The boys tended to be noticeably superior in total information and information in the areas of Social Studies, Mathematics, Physical Science, Biological Science, Aeronautics and Space, Electricity and Electronics, Mechanics, Motors, and Sports, while the girls were markedly higher in information about Home Economics and Cooking. The boys also tended to score more highly in the tests of Mechanical Reasoning, Visualization, Creativity, Abstract Reasoning, and Mathematics. On the other hand, the girls scored more highly in the various Memory tests, the Foreign Language Aptitude test, and the English test. The girls were very markedly higher in highly speeded tests, such as Arithmetic Computation, Table Reading, Clerical Checking, and Object Inspection. There was no difference between sexes in Reading Comprehension. On the Student Activities Inventory, the girls tended to score higher in Sociability, Social Sensitivity, Tidiness, and Culture.

For one sample, data are also available showing the distribution of total scores on the Information Test distributed by 36 categories of the occupation of the father. The average Information Test score varied quite widely from category to category of father's occupation indicating a very substantial correlation between father's occupation and over-all Information Test score. The children of such categories as clerical worker, unskilled laborer, farm worker and farmer tended to score on the low side; whereas children of officials, owners of businesses, and professional people tended to score quite high. The children of such categories as skilled worker, salesman, manager, and technician scored in between. An important finding here was that the children of the "don't know" category tended to score quite low along with laborers, farm worker, clerical worker, etc.

These data indicate that the father's occupational category may be very useful as a control variable in certain types of studies where the correlation between father's occupation and cognitive-type test performance needs to be partialed out or held constant. Since the correlation between father's occupation and cognitive test performance is quite high, this would mean that schools whose students are the children of such categories as officials, owners, and professionals will tend to score very highly on measures of aptitude and achievement even though they may vary greatly in their treatment of the students. On the other hand, if the schools have students who are predominantly the children of farm workers, unskilled laborers, etc., the aptitude and achievement performance of them is going to be very low even though the schools vary greatly in their treatment of the students.

By assigning weights to each father's occupation category, it will be possible to metricize this variable and use it as a continuous control variable. This may possibly be superior to using the conventional social-economic scale for similar purposes.

Each student in the study was required to write two essays and was given five minutes for the writing of each. The topics for the essays were: 1) "My Ideas about an Ideal Occupation" (describe what you would most like to do with your life), and 2) "What High School Means to Me." While these essay questions cannot be scored, at least immediately, for all of the students in the study, they will be held and scored later for samples of students of particular interest, such

as those who may become statesmen, scientists, or who were failures in life in spite of having many talents.

A pilot study is now under way to develop a scoring scheme for the scoring of the essays. A random sample of one hundred themes was drawn from the four per cent sample. These were classified and scored by two raters on a nine point scale. Inter-rater correlations were computed for subgroups and these range from .62 to .70. The Spearman-Brown formula would estimate a poteptial reliability between .85 and .90 for an average score from two themes each graded by two raters and averaged over-all. The themes were also scored for the misspelling that occurred. Here the girls were noticeably better spellers than the boys and were noticeably better in over-all quality of writing. This is very consistent with the results obtained on the Spelling and English Tests.

One interesting sidelight is that a considerable number of the girls wanted to be secretaries and a large proportion of them misspelled secretary. One of the most important objectives of the themes, however, is that of obtaining measures of the basic value systems of the students. A thematic scoring procedure has been developed for this in which each theme is rated on a go--no-go basis on a number of value factors. This approach shows promise of yielding a measure of such factors as altruism, scholarliness, hedonism, money orientation, religiosity, affiliation, security, achievement drive, and the like. The following examples of these themes show graphically the emergence of important values.

"Ideal Occupation" Themes

a. Boy aged 19. "The ideal peiece of work I would enjoy having would be something in line of social working among deliquents in New York or maybe a job as an artist. These jobs are both creative jobs and I think more suited for this type of work, for it gives me a chanch to express my self and maybe helping a job or two like myself."

b. Boy aged 17. "a millionire"

c. Boy aged 16. "I would like to go and work for my father and help him. But I would also like to be a Artist so I have not made up my mind as yet. And ideal occupation is one that can make a nuf money to pay the employer and to pay the owner for running it so he don't go bank rupt."

d. Boy, age unspecified. "My ideal of an ideal occupation is to do something important such as a research chemist. Also I would like to be a man of the world."

e. Boy aged 19. "I would like to go to college, play football, get married, have a family and a good job as a coach."

f. Boy aged 17. "I believe that the ideal occupation is a lawyer. A lawyer doesn't have to get paid by the week or month, but by the case. Some cases yield him more than the average persons total wages for a year. But of Course there are all different types of lawyers, such as criminal, Business--"

g. Boy aged 15. "I would like to go in the Air Force and let uncle Sam take care of me. I like the air force because it is one of the most active and talked about sirveses. I would like to be a bombidier if I am qualified. This job pays well."

h. Boy aged 15. "I'd like to go to college and be a dentist or a proffesional baseball"

i. Girl aged 17. "I would like to attend a beauty school and learn all the trades. Then I wouldlike to go out on the stripe or to Hollywood to work. Then I would like to get married."

"What High School Means to Me" Themes

a. Boy aged 19. "If I were to be dishonest, I would say I obtained much from high school; but alas, to my dismay, my honesty provides that I should tell the truth. It meant a good time!"

b. Boy aged 17. "High School means a great deal to me but the under-paid teachers a grouchy sometimes but it turns out in the long run & I like it preatty well but I will be glad when I can graduate and leave this community and everything in it. I learned a lot in school, more than I would have at home."

c. Boy aged 17. "High school is a means to prepare my self for college not only scolarly but socially. although I expect high school to prepare me, as much as possible, for the rigors of college classes, I also expect it to prepare me socially. A fine mine is very good, but even geniusus may become a nervous wreck."

d. Boy aged 17. "If I get hight school edcation it will make it easy to get a job if you have your hight deplomant to show that you went through school and to have a edcation you can get a good job in a plant being a boss or somthing."