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ABSTRACT

The next seven years will see important changes in the Washington Pre-college Testing Program for post-high school guidance. In the near future, the current cognitive emphasis of the program will be altered to include more attitudinal measures like a vocational interest inventory and an assessment of educational, employment, and life goals. In addition, the Program's ability to provide guidance and placement information will be increased by adding measures similar to those found in the U.S. Employment Service General Aptitude Test Battery. Eventually, the test will permit the making of institutional and academic program "type" decisions based on results of a junior year examination. Optional advanced credit examinations permitting better reflection of pre-college educational experience are also planned. Finally, the need to develop and incorporate non-intellective predictors of junior college performance and experience in guidance programs is discussed. While existing examinations, such as those in the Washington Testing Program, can accurately predict an individual's graded success, they are not currently capable of predicting one's personal growth, and immediate or long-range feelings of satisfaction concerning his college experiences. Recent efforts to discover criteria influencing these predictors indicate that one way to alleviate negative results is to provide some overlap between predictors and criteria. (J0)

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A Comprehensive Test Battery for Differential
Guidance in Community Colleges

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Predicting Criteria Other Than Grades
for Community Colleges

Patricia W. Lunneborg

These two papers were presented as part of a symposium on "Different approaches to placement testing in the two-year community college" at the American Personnel and Guidance Association Convention in New Orleans, March 1970. The first paper concerns the plans for modifying the Washington Pre-College Testing Program over the next seven years. The kinds of decisions confronting students entering two-year comprehensive community colleges will become the focus of this guidance testing program, which program constitutes a model for any state interested in equalizing decision-making information regarding education and vocations for its high school graduates. The second paper is an appeal for developing new predictors and criteria of the community college experience.

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A Comprehensive Test Battery for Differential

Guidance in Community Colleges

The community college testing program which I would like to discuss is part of a larger, statewide effort directed at vocational-educational guidance for high school students in the State of Washington. Both the existing program and its projected development are unique although there is nothing about what we are doing in Washington or the way in which we are doing it that could not find application in other states or areas of the country. Indeed, my purpose in describing our work is to suggest that it may serve as a model for those of you who elsewhere face the same challenges.

In the current parlance of educational research and development what we have might be viewed as a self-sufficient and self-contained demonstration project. We are self-sufficient in that, with minor exceptions, all of the development and operational expenses are met by the fee, currently \$7.00, charged each participating student. Again, with minor exceptions we are becoming progressively more self-contained. Our activities range all the way from test construction to the training of high school and college counselors in the use of coordinated guidance data. Before I detail our activities and plans, however, I should tell you who we are and a little bit about our organization and history.

The Washington Pre-College Testing Program is a joint effort of the secondary schools and nearly all of the two and four year colleges, both public and private, in the state to provide a common, useful basis for the guidance of students making the transition to post-high school education. The program is an outgrowth of the freshman testing activities at several colleges,

notably at the University of Washington, and is governed by the Washington Council on High School College Relations. This latter group, which has its counterpart in most other states, brings high school principals and counselors together with student personnel representatives of the several institutions of higher education. Supervision and development of the program is in the hands of three permanent committees--policy, research and finance--each similarly representative of the needs and interests of the high schools, community and four year colleges. Short-term planning and day-to-day operations are the responsibility of a small permanent staff headed by the program's Executive Director. Test administration, data processing, and much of the research and development efforts of the program are contracted out to the participating colleges and universities. The Bureau of Testing, which I direct, at the University of Washington is typical of such a contracting agency. Such testing or testing and counseling or guidance centers are already built into nearly every college and provide ready resources for similar cooperative efforts in other states. Both the organizational and operational structures exist in most states to accomplish what we have in Washington.

I earlier mentioned that our statewide program was an outgrowth largely of the freshman testing scheme at the University of Washington. This has given the program a very special flavor. Most testing programs are institutionally oriented. They are designed to meet institutional goals. Students are selected or rejected, assigned to one curriculum or another so that the school or the department may have the largest proportion of successes. True, it has been argued that what is good for General Motors is good for the country, that the failing student wastes his own resources as well as those of the school but the goals remain, nonetheless, those of the institution.

It is the benefit to the college, or, if you wish, to the larger society which the college serves that is to be maximized. But what of the individual? The resources, the potential of the ineligible student are largely ignored. Any benefit to him and, through his training, any benefit to society is overlooked when the paramount concerns are those of the institution.

In developing a freshman testing program at the University of Washington in the early fifties it was successfully argued that it was the needs and goals of individual students which ought to provide the focus. Those to be tested had already been admitted. None of them could now be drowned, rejected. To tell them how good or how bad they might be was beside the point. They were all in the University and the important question was not whether they should be there or not but rather how each of them might select most profitably from the offerings of that not-inconsiderable educational cafeteria. Most profitably, not to the institution, but to themselves.

I won't attempt to dazzle you with a technical account of the solution that was adopted to this question. A short description, however, is in order. The University developed a program of multiple differential prediction, to give it its proper name. This means that predictions of success were made for each student for each of a fairly large number of areas--ranging from 33 to 52 over some 15 years--areas of undergraduate study in the University. Each student received an estimate of how well he might expect to do in each of those areas, an estimate which for most of the history of the program has been in terms of the average grade the student might expect to earn in that area. With this information it was anticipated the student might improve the decisions he must make--what areas to explore, where to select a major, what courses to take together in any given term.

With grades coming under progressively greater criticism by students and educators this choice of evaluated performance as a criterion has not escaped question. It is not a matter easily disposed of and both Pat and I will later mention alternatives to grades as the goal of educational prediction. For the moment, let me say that at the time the program was developed grades seemed quite a reasonable criterion. If a student were to benefit maximally from the University he had to stay within it. If he were to stay within it, he had to do well enough to be permitted to do so.

This aspect of our University testing and of the statewide program which succeeded it earned for it the name "The Grade Prediction Program." An understandable name, predicted grade averages as an output have been a hallmark of the program, but one which ignores what I believe to be the more important aspect of the program. That is, how the predictions are obtained. Earlier I said it was a program of differential prediction. The differential part of the name defines the kind of information that is used to make the predictions. The particular measures, the particular tests and high school subject matter grades, selected for use as predictors were selected not because they could tell a University freshman whether he was going to be a good student or a bad student but whether he was likely to be a better student of psychology than of history or a better student of geology than zoology. That is predictors were selected on the basis of their ability to differentiate between performances in the several subject areas. That was the heart of the University's freshman testing program. It was the individual student who needed to make decisions and what would help him to do so more effectively was the information that he might expect to be more successful doing one thing than another. Exactly how well he might do was of lesser importance than his being able to order the alternatives.

Thus, a testing program, or, at least a battery of tests, was born in the fifties. Other colleges and universities in the state became interested. They liked the philosophy. Why, they asked, couldn't we tell a larger group of college-bound high school seniors "We accept that you want to continue your education. That is a given. Now you need to make some decisions about where to go and what to do. Here is some information about yourself that may help you make those decisions." High school people were also enthusiastic, here was a testing program that wasn't oriented to the needs of some college but could contribute to the high school's own guidance program. In 1960 the statewide Washington Pre-College Testing Program became a reality.

At the outset the Pre-College program probably had as firm a foundation in accomplished research--test selection, validation, normative data--as any testing program. It was tooled up to do a particular job rather well. That job was one of telling high school seniors intent on a liberal arts or professional baccalaureate where their strengths and weaknesses were. The sixties, however, were years of educational explosion and, in our state, this has been nowhere so evident as in the fantastic growth of comprehensive community colleges. Today something in excess of 60% of those high school graduates who continue their education at least begin that extension in a community college. The high school student now has a quite different set of educational alternatives and decisions to make. The Pre-College program recognized this shift and has been busy trying to meet the new needs. We first satisfied ourselves that success in many of the vocational-technical programs in the community college were just as predictable from our traditional aptitude battery as was performance in a good many of our academic areas.

Despite this initial success in predicting community college performance it has become clear that the current Pre-College battery of tests is far from completely responsive to the decision-making needs of students entering these two-year schools. For example, a mathematics achievement measure that works well for placing students in the initial courses in university level mathematics only frustrates community college entrants and their counselors. In response to this the Pre-College program has committed itself to a long term redevelopment project. It is projected to run for seven years and will result in completely new batteries of tests constructed and validated to meet the educational-vocational decisions of all of the state's high school students. I would like to preview with you at least those parts of the project that have particular relevance to those students choosing a community college.

Historically our day-long battery provided for the measurement of verbal aptitude and achievement, quantitative aptitude and achievement, spatial visualization and mechanical reasoning. It is as long as it is because it includes some rather reliable tests that do double duty in meeting at least the four year college student's needs for placement in English and mathematics. All of the tests, you will note, are what are styled cognitive tests. Even so, they span relatively few of the cognitive dimensions. As an immediate goal we intend to expand that coverage to at least match the complexity of the U. S. Employment Service General Aptitude Test Battery. GATB, you may recall, exclusive of its manipulation tests, taps Form Perception, Clerical Perception and Motor Coordination as well as four factors, Intelligence, Spatial, Verbal and Numeric Aptitude which are well represented in the existing Pre-College battery. To this end we have introduced last year and this experimental forms, constructed within the program, to measure motor coordination, form perception,

perceptual or clerical accuracy, and two-dimensional spatial visualization. We have added as well a verbal reasoning measure on the strength of earlier findings of its contribution to differential academic prediction. One of our concerns in matching the GATB coverage, in addition to the predictive potential of that array of abilities, that relates directly to the placement problem is that entry into certain state and federally supported vocational-technical programs is dependent upon an established profile of GATB scores. To be able to provide GATB equivalent scores thus adds an important function to the program.

Particularly as we consider alternatives to graded performance as outcome measures of the educational experience we can not successfully limit our predictive batteries to the assessment of cognitive abilities. A series of researches within the Pre-College program have established that biographic data, occupational and educational interests, orientation and goals may play a crucial role in estimating educational outcomes. As a result a biographic data sheet is now a routine part of the Pre-College battery and this spring for the first time all participating high school juniors will be completing an extensive Vocational Interest Inventory. Work is also underway on an assessment of educational, work and life goals.

All of what I have just described to you is slated for a Phase I or Junior Year Battery. Currently the Pre-College Program offers a uniform battery of tests to high school juniors. It is intended to meet both guidance and placement needs, that is, to help both students and institutions make decisions. Students and educational programs, however, are now both so variegated that such a universal assessment seems to have limited usefulness. We are moving therefore towards what we call a split-battery. Briefly, the

program will offer two half-day tests, one for high school juniors and one for seniors. The junior year battery will be common to all participants, will have much the complexion I sketched earlier and will have as its goal permitting the student to make what might be called "type" decisions--what type institution should I be thinking of, community college, four year college or university; what type program, vocational-technical or academic; are the social sciences more appropriate than the humanities; would I find more satisfaction in training for a middle management position than for a skilled trade. With these preliminary decisions made, the Pre-College program will then be able to offer a second phase, Senior Year Battery which is close to tailor-made for the student or at least tailored for groups of students. We earlier tentatively tagged this second testing a placement battery, which suggests a major aspect to this later program. For the student with fairly well-delineated educational goals it would be just that. If a student indicated that he plans to transfer after one year at community college to the University's College of Engineering his senior year battery might consist of a mathematics achievement test (keyed to the amount of mathematics studied in high school), an engineering drawing and principles test, and, if his junior year test data or high school record suggested it, a diagnostic communications skills or study skills test. A student applying for or choosing among skilled trades programs might round out his GATB profile by completing the manipulation subtests. The second year program also would embrace Advanced Credit examinations for the student whose pre-college educational experience is not adequately reflected by his high school record. The second battery, however, will not be limited in all cases to placement or classification instruments. As the first battery aids the student in making "type" decisions the second should help him make

more specific decisions not only on the basis of his placement but upon an additional assessment of aptitudes and interests. This again would not be uniform across students. The student wanting to choose among the social sciences will need different information than the one choosing among the natural sciences. A large centralized testing program operating statewide can accommodate such variability where individual institutions could not.

In our seven year plan placement instruments are receiving first attention in the development of this second battery. Multi-level mathematics proficiency, diagnostic communications, reading and study skills, foreign language reading and listening comprehension are our early targets.

The kinds of educational-vocational decisions that we see confronting students dictate not only our search for tests but our validation strategies as well. We will be continuing differential prediction. If the student is to choose wisely he must know what the alternatives are and what those alternatives are likely to mean to him in terms of success, satisfaction, personal fulfillment. Graded performance or satisfactory completion of a program will continue to be prime criteria but it cannot stand alone and we are prepared to continue our search for ways of forecasting nongraded educational outcomes.

Predicting Criteria Other Than Grades for Community Colleges

We are aware that what we do is offensive to many counselors in community colleges. "An expert on junior colleges" who reviewed one of the studies included in this report had this to say about our work. "I think the assumptions on which the study is based violate accepted philosophy of community colleges. Community colleges generally enroll students who have a low self-concept, are uncertain of future plans, and who have questionable potential for academic success. How could this type student benefit from 'knowing whether he will at least find the experience satisfying and useful later in his work'? (We had suggested this type of information might be helpful.) (Continuing he said) The last paragraph appalls me! The possibility of precollege testing for students to have information on 'likelihood of adjustment, satisfaction, job relevance, growth, etc.' (our suggestions again) destroys the concept of community colleges as a place where students can try to find their place in academic and career lines. Why give the student more strikes than he already has by trying to predict what he will do?"

After picking myself up off the floor I decided I'd keep researching this area. To start with, my value system is diametrically opposed to this view. I believe an individual benefits most by knowing as much about himself as possible at any point in time. The reviewer believes information hurts; I say in the long run it helps. The reviewer might counter that information in the right hands, expert hands, could be used to help others, but that those others should not be trusted with it. Again, I would disagree. One credo of the guidance system you have had described is that test results go directly to students. Great attention must consequently be paid to conveying

results in forms that can easily be understood by students. The system accepts as an unfortunate fact that there are not enough counselors and counseling time and that students are probably going to have to assimilate, interpret, and act upon the information independently. Feedback must therefore be clear, straightforward, and encouraging as far as decision-making is concerned. Such feedback must constantly be evaluated to make sure students are getting maximum benefit from it.

And it is here that I would disagree with the reviewer on a third basis. It was contended that the community college student in particular should be protected from knowing about himself. He was portrayed as so down-trodden and misfit educationally that perforce any additional information could only serve to lower his already low self-concept. I would argue that if prospective community college students are presently getting little from a guidance testing program, then they should become the focus of subsequent improvement. If that program is presently doing these students more harm than good, then it should not be scrapped but made to satisfy their needs. If some students can find nothing encouraging as regards educational decision-making in their test feedback, then the system is failing them and is due for radical change. The Washington Pre-College Testing Program is now giving highest priority to this problem and is committed to the notion that more not less information needs to be made available to community college entrants.

Just what is wrong with the current set of predictors of college performance as applied to the community college setting? Nothing, if students are satisfied with predictions of graded success in academic courses, English, mathematics, social and natural science. The battery, which consists of six high school GPA's coded from transcripts (English, foreign language,

etc.) and 12 test scores, produces very accurate grade predictions of academic course work whether taken at a 2-year or 4-year school. There is also nothing wrong if students are satisfied with predictions of graded success in vocational courses, auto mechanics, secretarial studies, data processing. Surprisingly, the battery, which was not devised with vocational-technical courses in mind, predicts vocational grades just as well as academic grades. The Washington Pre-College Program was greatly concerned some years ago about adding tests to make the battery work for vocational programs, only to discover that the battery works fine as it is. It may very well conflict with the objectives and ideals of some community colleges to accept that performance in agriculture and welding is so heavily determined by high school grades in English and electives, and test scores in English usage and quantitative skills. Vocational grades are apparently unwittingly influenced by the student's ability to read, to express himself verbally, to write coherently, etc. Whatever behaviors got good grades in high school get good vocational-technical grades in community college. So the Program does not have to be in a panic to come up with special tests for technical programs and indeed, can expect when such new tests are added, that community college vocational grade predictions will be the most accurate in the system.

There is still something wrong with the battery, however, if all it predicts are grades, no matter how accurate a job it does. For what the typical community college entrant learns is that he is likely to do marginally in just about everything. This may be simple and straightforward--it is also very discouraging. The battery, you will recall, is designed to facilitate an individual's decisions among alternatives--whether to fulfill one's natural science requirement with chemistry or biology, whether to major in

English or history. It works best for the average student. For the superior student the feedback is that he will do well in everything, for the inferior student that he will do poorly in everything, given the ways grades are assigned in college. The battery currently slights students with lower potential for graded success because it does not tell them anything to help make decisions. Community colleges have other goals than passing out traditional grades and these need to be elaborated so as to form new criteria of the experience of community college study. What is wrong with the present predictor battery is that it is not large or diverse or relevant enough for the range of possible criteria.

You might wonder about that judgment. After all, if the battery had been found to work so well for vocational course grades, perhaps it could also predict such things as decisions about career, perceptions of college, plans and goals, etc. So we found out.

With one sample of 631 students from three community colleges it was possible to compare the predictability of the Washington Pre-College tests with the College Entrance Examination Board's new Comparative Guidance and Placement battery. The latter included twelve interest measures, i.e., interest in subject matter such as music, business, fine arts, so there were many intellectual and several nonintellectual predictors. There was only one intellectual criterion--first-year cumulative GPA but a host of nonintellectual criteria, all resulting from a questionnaire mailed to students during their freshman year. The questionnaire did not seek to measure extracurricular achievement as others have done (Richards et. al., 1967); the emphasis was instead on decision-making and personal growth in this setting.

The results were very disappointing. The nonintellective criteria were generally unrelated to the tests and to the intellective criterion, overall grade point average. It was easier to predict educational and vocational orientation and plans than either first-year college experiences or perceived college characteristics. These latter were considered most important in indicating actual effects of higher education. Especially disheartening was the lack of predictability for a 40-item, true-false Community College Satisfaction Scale which contained items such as "The instructors were more concerned than at other schools with being good teachers" and "Counseling and advising for students planning to transfer was inadequate." Where the predictors were successful, however, it was the nonintellective, CEEB interest measures that did the job. Wherever there was obvious overlap between them and some criterion, e.g., choice of a technological career was associated with low interest in humanities and high interest in engineering, the interest measures worked. It is my bias to lay the greater blame in this study on the predictor battery; although clearly the self-report questionnaire could be made more reliable, the absence of predictors having anything to do with readiness for change, occupational interests, and attitude toward higher education was the primary flaw. The message is that the present batteries predict grades and little else.

A second study sought to measure nonintellective criteria after community college; perhaps two to four years later might produce more stable judgments as to the gains from this educational experience. Predictability of fifteen such nonintellective, long-term criteria of community college success was compared with predictability of college grades for 1,775 students from six schools. Again, in contrast to the American College Testing Program assessment

which focuses on other kinds of achievement than grades (Baird, 1969), our indices stressed personal reaction and adjustment to school. And again, these nonintellective criteria came from a mailed survey while the intellective criteria, GPA's in seven areas, were taken directly from college transcripts.

The message was the same. Unless there is obvious overlap between predictors and criteria one is practically assured of negative results. The four nonintellective criteria which were predictable were items asking for number of college credits acquired to the present, whether the student had transferred to a four-year college, whether his program was academic vs. vocational, general, or business, and the question, "How far do you plan to go in college?" It is easy to see how these are related to grades. Survey items to measure emotional feelings, satisfaction, utility of college for employment, and type of current employment were not correlated with the battery of predictors.

A third study using mailed questionnaires produced the same results. Questionnaire data regarding post-high school education four years after high school graduation revealed the following items predictable from the precollege battery: choice of community college to begin college studies (-.51 with HS English GPA, -.42 with HS foreign language GPA, -.36 and -.34 with English usage and Vocabulary, respectively), amount of college credit earned, having received a B. A., extent of educational goal, and student status during each of the succeeding four years. Important items concerning satisfaction with earnings, occupational interest group, current and projected in 10 years, and occupational level were unpredictable.

So now the quest is on, and it is necessarily a dual quest. From students and community colleges themselves we must pinpoint what students are

doing there. We hope to take the promises in the catalogs, the goals of the teachers, the hopes of the administrators, and the dreams of the students and make reliable criteria out of them. At the same time there will be a parallel effort to develop useful predictors which administered in the junior year of high school can provide some foreknowledge of the likelihood of personal growth and satisfaction in this setting. But if, as pointed out, the best prediction is found when predictors and criteria correspond closely, e.g., a high school music achievement scale and a college music achievement scale, just what form will predictors take of such an elusive as "getting more out of life"?

One instrument being administered statewide this spring is a Vocational Interest Inventory which provides ipsative scale scores on eight vocational interest groups as defined by Anne Roe: service, business contact, organization, technology, outdoor, sciences, general cultural, and arts & entertainment. The first set of 56 items consists of occupations with socio-economic level controlled, e.g., proofreader's helper vs. cook's helper, agent for top movie stars vs. history professor. Item analyses have established that each alternative correlates highly with the scale for which it was written and does not correlate with other scales, e.g., that proofreading contributes to general cultural and not to anything else. A second set of 56 items are competing activities based on the eight groups so that like the first set each Roe group is matched against each other group twice. An example: "If I worked for a politician, I would rather (a) write speeches (b) arrange a speaking tour to major cities." The results of this first administration will be made in standard score and ranking form together with a listing of college majors, community college vocational programs, apprenticeship trades, armed forces

school programs, and on-the-job training programs which would logically fall under these eight interest groups, e.g., under service would fall both the four-year college social welfare bachelor's program and on-the-job training in cooking.

Other instruments based on ideas supplied from people in community colleges and hopefully waiting in the literature can be given experimentally, e.g., the family background and work values questionnaire of Faine et. al. (1967) and various scales designed to measure readiness for change. If the program is going to provide information regarding the kinds of satisfaction and dissatisfaction one can expect in college, measurement of this complex trait must be attempted at the high school level. If strides in social maturity are important to students, then again this trait must be assessed before as well as after.

In the course of evaluating an OEO teacher aide program at Seattle Community College I was struck by the discrepancy between the official definition of college success, i.e., that of the federal and college bureaucrats involved, and the actual definition of success, i.e., that of the teachers and students. If OEO looks only at test scores, grades, and college credits earned, it will have to conclude the teacher aide program is a bust. Depending on how tests are presented to these students, the majority of them can be expected to hand them in blank. To analyze data such as these is ridiculous but its been done. However to observe and record and interview students and teachers over the year is to come to a quite different conclusion about the success of this educational experience. Almost all students at the year's end felt that they were now more willing to try new things, had greater confidence they could still learn, and now understood children better and had greater

interest in working with them. They were satisfied with their studies, felt their classes useful, and very much enjoyed the time spent at school. Both students and teachers felt they had learned all the classroom skills necessary to perform as very capable aides. I personally feel these outcomes of college experience so worthwhile to predict, that I will continue to argue for a greater share of testing time to search out nonintellective predictors and to better account for community college criteria other than grades.

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