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1973
SCALES FOR PREDICTING STUDENT SUCCESS  
IN HIGH SCHOOL VOCATIONAL PROGRAMS  

DISSERTATION  

Presented in Partial Fulfillment of the Requirements for  
the Degree Doctor of Philosophy in the Graduate  
School of The Ohio State University  

By  

Thomas Eugene Hyde, B.S., M.Ed.  

* * * * * *  

The Ohio State University  
1973  

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Many others too numerous to mention were instrumental in furthering the progress and development of these scales, but none were so belabored as Peggy Hyde.
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CHAPTER I
INTRODUCTION TO THE PROBLEM

Introduction

It has been projected that by 1980 a college education will be necessary for only about 20 per cent of all jobs and that a technical education program beyond high school will be sufficient for about 25 percent of all jobs. If these projections are true, the traditional academic (or college prep) stress of our secondary school systems renders little service to the 55 per cent of our youth for whom a high school education may be terminal. Too many young people today graduate from or leave school unqualified for either college or for a job. The percentage of unemployment among youth of ages 16 to 21 is on the rise: 19 per cent in 1966 as compared to 29 per cent in 1969. It is the hope of vocational education to stop the climb of these statistics by providing young people with job orientation and job preparation instruction so that they leave school with a saleable skill.

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2Herbert D. Brum, "The Role of State, Local and Teacher Training Personnel in Developing Programs for the Disadvantaged and Handicapped," Paper read in Atlanta, Ga., February 17, 1970, p. 1. (Mimeographed.)
Yet there is great concern among educators as to why students are not enrolling in vocational programs. One answer lies in the inadequate counseling or biased counseling by guidance personnel whose own social background has not allowed them the opportunity "to develop the understanding of and respect for the dignity of work as appreciated by people who earn their living by pursuing various other than white-collar jobs."

Another reason is because of an "image" created by a "national attitude that says vocational education is designed for somebody else's children." Many students who could benefit from vocational preparation are "turned off" by the stigma attached to a program believed to be for those who cannot perform satisfactorily in the academic curriculum. One way to combat this attitude problem is to have more research data available to teachers in vocational education. If test instruments using positive criteria are used to establish norms for people to get into vocational programs, then they "will not become programs into which people are dumped." 


5Riccio, p. 114.
Better methods of student selection will be increasingly important in the future as many states establish new standards for vocational education. The State of Ohio has required each school district to provide vocational education for eligible students by September, 1974, according to the following percentages:

<table>
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<td>50% or less</td>
<td>40%</td>
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<td>50-60%</td>
<td>30%</td>
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<tr>
<td>60-70%</td>
<td>20%</td>
</tr>
<tr>
<td>70% or more</td>
<td>10%</td>
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To more efficiently handle the higher percentage of vocational students, many school districts have combined their efforts by constructing joint (area) vocational schools. In addition, Ohio has completed the reorganization of its 639 school districts into 104 vocational education planning districts (V.E.P.D.). This redistricting has resulted in a greater number of students per program as well as a greater number of student candidates choosing the various programs. And herein lies the problem.

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Statement of the Problem

With the increased emphasis on vocational education and more students availing themselves of vocational programs, the importance of student selection or placement grows more complex. It has been common practice in the past to "obtain," rather than "select," enough students to fill vocational classes. But when applicants exceed available openings, how are decisions to be reached regarding which individuals will be selected for a training opportunity? Will the student's choice of program be the best choice he can make? Are the students placed the ones most likely to achieve success in the program? Will the counselor have the time to apply a more discerning process? Such questions point to the need for an objective and practical instrument for the prediction of student success for use in student placement. Students in the lower academic ranks are often excluded from the opportunity to participate in special training programs because "selection may be based on the same criteria used for selecting students for college...." Thorndike and Hagen point out that while there has been some success in predicting academic success for college students, we have been generally and consistently

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ineffective in predicting occupational success.\textsuperscript{10} Yet it is these students "who will have the most difficult time surviving without skills training."\textsuperscript{11}

This study tested the predictive validity of one placement or selection method—placement or predictive scales (Hyde-Scales) designed by the author. The objective was to ascertain whether, from a group of prescreened students who had expressed a desire to enroll in a particular vocational program, the students could be objectively and reliably counseled and those who could best benefit be placed in that particular program. The study sought to determine the relationship between students' scores on the Hyde-Scales and their performance in their respective vocational education courses.

Due to the large number of programs offered in vocational education, this study concerned itself solely with placement of students for seven vocational education programs. The selection of these particular programs is explained in Chapter III. This study was based on the findings of studies conducted at three different Ohio schools (Lancaster High School, Barberton High School and the Muskingum Joint Vocational School) where the Hyde-Scales are being evaluated for placement of students in the schools' total vocational program, as well as for the seven specific programs examined in this study.


\textsuperscript{11}Wells, p. 369.
Need for the Study

Of the many systems for student placement, most are either too complex (e.g., involving elaborate set-up or computer usage), or more time consuming than the counselor can afford, or have never actually been introduced into vocational school systems for widespread use. Perhaps the great diversity in practices is due to insufficient criteria for selection procedures.\textsuperscript{12}

Federal and state guidelines indicate only three broad selection criteria--age, average intelligence, and "potential for achieving competence."\textsuperscript{13} "Potential for achieving" is a very important admission criteria, yet it is not defined. This vagueness allows a great deal of latitude to the individual school district's desires on which criteria to use. In spite of numerous criteria, selection procedures are often not truly objective (e.g., often just one person's opinion after reviewing certain information), or not agreeable to an instructor, a guidance counselor or perhaps a parent. A review of forty-odd years of research on student


selection attests to the persistent inadequacies of guidance selection methods at the high school level.\textsuperscript{14} A real need exists for the selection and development of positive selection criteria for students seeking admission to vocational programs.\textsuperscript{15} This study involved the development of positive selection and predictive criteria which, once constructed, allow a reliable and uniform prediction and the application of these instruments (Hyde-Scales) to be applied to each taxonomy.

A review of pertinent literature and research (Chapter II) revealed that grades, aptitude testing, interest, motivation and other variables have been individually experimented with as predictors of future performance in training programs of many types, but that more effort will be required to identify and measure the non-intellectual variables relevant to vocational behavior.\textsuperscript{16} The use of the author's predictive scales as a performance/prediction tool is an attempt to objectively record and relate all those variables which guidance personnel normally evaluate as they interview

\textsuperscript{14}William E. Stock and Frank C. Pratzner, \textit{Review of Research on Student Selection and the Prediction of Success in Occupational Education}. Minnesota Research Coordination Unit in Occupational Education. (Minneapolis: University of Minnesota, 1969), p. 11.


\textsuperscript{16}Stock and Pratzner, p. 4.
students. The criteria being used not only include certain standardized tests and academic grades, but also other variables which the author or school system feel are predictive, such as attitude and program interest, teacher and counselor recommendations, motivation, and numerous others—depending on the school's philosophy, testing programs, and availability of information.

Newly developed appraisal instruments need to be researched and tested in the specific setting in which they are to be used. Few such studies have been completed at the local level, mostly due to the professional research time and funds required. The author's predictive scales are presently being tested in three local Ohio school settings where vocational programs are offered. With the use of this predictive system, the author hopes to benefit the student in the following manner:

1. To provide a guidance tool which helps the student decide which program to select and indicates how he might perform in that program; to guide the student toward finding his best educational opportunity. (The scales would be normed over several years.)

2. To improve the prediction of a student's performance in a specific high school vocational program, to project his potential for achievement.

3. To objectively document placement of students for vocational programs.

4. By organizing a uniform admissions program with entrance standards which include educational achievement and ability levels, to

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17 Loudermilk and Diminico, p. 24.
increase the confidence of the entering student and give him greater pride in his choice,\textsuperscript{18} thus eliminating the "dumping ground" effect.

Benefits to the guidance department, teaching personnel, and others:

(1) By involving other teachers in the placement of students for vocational courses (e.g., their participation is needed for a student attitude rating), to build better understanding between general and vocational education.

(2) To provide objective data-information conversion procedures which make it easier for counselors to approach test interpretation as a science rather than an "exercise in tea-leaf reading."\textsuperscript{19}

(3) To allow the guidance department to evaluate their own system with simple rank order and correlation techniques.

(4) To develop a system that is reliable, valid and considered fair under the scrutiny of lay personnel, such as the Board of Education—-a selection procedure which can justify at a later date why students were or were not placed in a program.\textsuperscript{20}

(5) To provide a system that can be basically applied to data processing, relieving the counselor of extensive "red-tape" evaluation in some areas of information.


\textsuperscript{20} See Appendix C, p. 112 for a letter from an Occupational Work Experience Coordinator.
Without focusing on these aspects, there are also certain long-range effects which can be brought about by the result of accurate student placement procedures: ²¹

(1) Easier and less expensive for school and classes to serve the needs and interests of the students, employers and the community.

(2) Fewer training problems because the interests and abilities of students more nearly match the demands made by the training.

(3) Employers secure better qualified workers and have lower turnover among beginning workers.

(4) Lowered drop-out rate among students.

It has been obvious to this author that more and better appraisal instruments are needed. During service as a Trade and Industrial teacher-educator at Kent State University, the most prevalent complaints among my teachers concerned students who had been incorrectly placed in their programs. Exploration of the selection problem with guidance departments and vocational counselors revealed that, although the selection was often accomplished with great care, the students available for placement were just not of the quality that the teacher expected. Though the counselors also scrutinized the selection procedure, they were not able to find a method that seemed to please the teacher or themselves.

²¹Fowler, p. 64.
A near lawsuit in Barberton, Ohio, from an irate parent whose son had not been selected for a vocational class\(^\text{22}\) finally started the wheels in motion. The guidance department had done a good job of selection in this particular vocational area, so the crisis passed. But the head of the department, Mr. Robert Hunter, related his deep concern that there were other vocational programs that would have had very little objective proof to indicate why a particular student had not been placed in that particular trade area. This concern for the legality of "unselection without documentation" was the originating need behind the development of the selection scales.

Decisions are a necessary part of life and those concerning people should be improved by the use of instruments which improve our understanding, prediction, and to some extent the control of human behavior.\(^\text{23}\) No one instrument may be capable enough to enable it to stand alone as an effective counseling aid. "People are complex and the personal factors which contribute to success in different occupations are varied. Therefore, data has to be gathered on many variables, and these data must be

\(^{22}\text{Robert Hunter, Barberton Public School System, "Student Selection for Vocational Programs" (unpublished paper). (Mimeographed, p. 1)\}

\(^{23}\text{Loudermilk, p. 1.\}
synthesized into some easily interpretable data." Tests and similar appraisal instruments, when administered and interpreted by professionals, can make a significant contribution to programs of vocational guidance, selection and placement, but as yet "the task of converting a counselee's test scores into usable information is left undone. " Profiles have been the principle method of summarizing data on many variables, but it is difficult to know how to interpret variations in profiles as the number of the variables in the profiles increases.

**Objectives**

The following specific questions were answered and relationships studied:

(1) What is the relationship between students' scores on the Hyde-Scales and students' performance as indicated by the following criteria?

(a) First year instructor's ranking of the student's level of performance (with relation to the students he would hire first if in the role of an employer)

(b) Grade average earned for that vocational course

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25 Loudermilk, p. 91.

26 Prediger, p. 3.

27 Pucel, p. 5.
(2) What is the relationship between students' scores on the Hyde-Scales and the counselor's ranking of students' probable performance in vocational education courses? (Where applicable.)

(3) What is the relationship between the counselor's ranking of students' probable performance and the students' actual performance as measured by the performance criteria (la and b)?

(4) Item analysis of the criteria used in each scale in each vocational area (taxonomy) versus students' performance criteria (la and b).

The major hypothesis tested: that scores on the Hyde-Scales predict students' performance in vocational programs.

Similarity of the findings (correlations) in all the vocational areas tested suggests that the Hyde-Scales could prove valuable as a generalized prediction instrument, perhaps even nationally, for any school offering vocational programs. A student receiving low scores on the Hyde-Scales would not be one who could "best benefit" by a certain vocational program for which he was applying and, therefore, would not be placed in that program over a student who would really profit more.

Assumptions

The basic assumptions underlying this study are:

(1) Placement involves two decisions. The student's choice of program is as important as the guidance department's selection of the
student for admission to that program.\textsuperscript{28} For purposes of this study it was a prerequisite that the student had already selected a vocational program in which he wished to enroll.

(2) In the future, the number of students desiring a certain program will often be larger than the number of candidates which can be accepted. The goal, then, is not to simply "fill" the class but to help choose, counsel and guide candidates and, even of necessity, eliminate others. This selectivity occurs for two reasons: either (1) the enrollment must be kept within state maximum number requirements for that type program, or (2) the economy of a particular planning district and the state can support only a certain number of student placements on job stations per graduation year.

(3) At times this study will treat the ability to predict success in a particular program as a possible synonym for placement in the program. In other words, the students who can best succeed in a program (most successful in that unit) should be placed in that taxonomy if they have selected it.

\textsuperscript{28} Fowler, p. 6.
CHAPTER II

REVIEW OF RELATED LITERATURE AND RESEARCH

Introduction

Awareness of the need for improved student placement techniques and prediction of student success in occupational education is due to:

(1) accelerated enrollment in vocational-technical education over the past ten years, (2) expanding operating costs, (3) shortages of instructional personnel, and (4) a greater concern among educators for the sense of failure and frustration experienced by unsuccessful students.\(^1\) These conditions, and the additional incentive of Federal legislation such as the Manpower Development and Training Act, the Vocational Education Act of 1963, and the 1968 Amendments, have called attention to the need for effective ways of helping students find vocations in which they have the greatest possible chance of success.

Selection criteria such as scores on the American College Test or the School Ability Test have long been in existence for students wishing to go to college. This type of indicator is also needed for high school

\(^1\)Stock and Pratzner, p. 1.
students enrolling in vocational education programs. Though there is much research which attempts to identify criteria for student selection, it is a relatively young field of research and no definite results supported by empirical investigation seem to have emerged up to the present time. However, current literature and research were surveyed to discover what factors thus far have been identified as related to performance in vocational education courses. These findings have supplied the basis for recommendations of placement criteria to be used in the Hyde-Scales.

Review of Related Literature and Research

Much attention has been focused on aptitude tests as successful predictors of achievement. The General Aptitude Test Battery (GATB), the Differential Aptitude Test (DAT), and the Iowa Test of Educational Development (ITED) have been subjected to numerous investigations and seem to have application to many vocational-technical curricula. Traxler found the GATB to be a useful instrument in counseling and placement because it is a multi-factor test which lends itself to aptitude profile.

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3Loudermilk, p. 82.

A significant relationship was found by Tate between GATB scores and selected vocational-technical course grades. Armstrong also used GATB, DAT and ITED scores as predictors of grade point averages of students who later graduated from area vocational schools. It might be of interest to review the letter of August 14, 1972, (Appendix C, pp. 113-114) indicating the concern in the state of Ohio when the GATB test is used by a school system for placing students.

At the college level, Jex predicted academic success by use of high school grade average and achievement test scores and Kwon used solely the definiteness of a student's vocational educational goals. Class attendance records have been used as a measure of student motivation.

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6Loudermilk, p. 89.

7Frank B. Jex, Predicting Academic Success Beyond High School (Salt Lake City, Utah: University of Utah, 1966).


and poor worker potential has been identified on the basis of psycho-social characteristics such as low aspirations, low achievement value, and poor self-image. In an effort to determine the predictive value of autobiographical or personal information through expanded use of the high school record, it has been shown that certain systematic differences were implied between persons who succeed and those who do not.

The value of student interest as a predictor has also been scrutinized. John Holland expressed his belief that a student's own preference and expectations provided the best predictor. Student interest was listed by Norton as one of the replacements for Super's self-concept theories of vocational choice. It has been shown in a study by Williamson that an individual's interest can be determined by his selection of definitions of words which relate to his interests. Dayton hypothesized that the greater

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12 David J. Pucel and Howard F. Nelson, General Aptitude Test Battery (B-1002 Form B) Training Success Norms (University of Minnesota: Project MINI-Score, Department of Industrial Education, February, 1969).

congruence between a student's vocational preference inventory (VPI) profile and his grade level profile, the better his academic achievement and behavior.\textsuperscript{14} Dayton confirmed that a student's performance in the classroom related to his VPI Profile and to teachers' ratings of his classroom behavior.

Various test batteries of multiple predictors for student achievement have been developed or evaluated in broader, more indepth studies. Loudermilk's battery contained 23 predictors derived from a combination of the GATB, a physical fitness battery and a personality inventory.\textsuperscript{15}

Extensive studies of pertinent literature by Patterson listed the following conclusions:\textsuperscript{16}

(1) The higher the skill level of the trade, the greater the relationship between intelligence and success in the course.

\textsuperscript{14}C. Mitchell Dayton and Norman P. Uhl, Relationship Between Holland Vocational Inventory Scores and Performance Measures of High School Students (N. p., 1966).


(2) Tests of verbal ability or general intelligence, visualizations or spatial relations and tests of mechanical experience were useful predictors.

(3) For certain types of mechanical work, tests of arithmetic or mathematics have shown considerable validity.

(4) Little work had been done on the use of interest testing in the prediction of vocational course success.

(5) It should be possible to select a battery of tests which would combine to yield fair predictions of success.

(Note that this study deals with not just one test or specific grouping, but a combination of all the elements used for prediction in any individual school.)

Prediger's study explored the various success predictors used in high school vocational programs with the following findings:¹⁷ (1) there was considerable variation in the level of correlation obtained for a given predictor within a given vocational area; (2) the predictability of success was greater in some vocational areas than in others; (3) the effectiveness of a given predictor varied from one vocational area to another; and (4) verbal I.Q. should not be used as the sole predictor in vocational studies. (This supports

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the author's inclusion of all criteria that the instructional and guidance staff desired, even if several correlated equally high.)

Whitten found that the best predictors for persistence in and graduation from vocational programs were based on ninth grade data such as: attendance, combined academic average, age at entry, intelligence, and achievement in a junior high level industrial arts or home economics course.

A survey of selection criteria being used in Ohio revealed that there were no standard selection criteria used in all school districts in Ohio, and that criteria varied from no criteria to highly selective criteria. Beck developed his own model criteria, based on evaluations made by a panel of professional vocational educators, and recommended that these criteria be placed into operation on a statewide basis for experimental purposes. But even his review panel of experts disagreed greatly on the "what" and "when" of its application.

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19 Beck, passim.
A new approach seemed to be Project Mini-Score in Minnesota which is developing an ultimate vocational counseling information system based on statistical tools which allow the combining of knowledge of separate variables that relate to success in a given occupation into one score ("centour methodology"). The scores are being validated by comparison with successful people already at work in the various fields. But this is a system which cannot be adopted directly for high school vocational programs because of its complexity and apparent lack of interest by guidance personnel in the rest of the nation.

Most of the studies were rather inconclusive because the time factor has not been long enough to bear out the indicated findings through follow-up. One of the best longitudinal studies was a 15 year study conducted at Los Angeles Trade-Technical College, California, where test batteries were developed, validated and found to be predictive for some 55 trade and technical curricula. It is Crawford's opinion that the I.Q. tests of


scholastic achievement standardly used to predict college achievement are of limited value in predicting success in vocational classes. Many of the persons "discriminated against by the verbal facility required in these tests can actually perform at a high level of skill in such non-verbal areas as dexterity, ability to see details, make judgments and visualize objects."22 This comment is often repeated by minority groups when I.Q. is the basic item of a selection system. Crawford advocated the use of trait and factor theory in the study. Measurement of individual traits and separate factors of intelligence were followed by empirical combinations of these measures into aptitude test batteries specifically designed and weighted to predict success in specific areas of vocational training within a specific institution. The process involved job analysis to determine the necessary intelligence factors for success in specific occupations. The factors showing the greatest relationship with teacher ratings of the students' performance in the course were placed in the finalized test batteries. This multifactor approach was also used in combination with an applicant-counselor-instructor interview as the basis for student selection. The results at L.A. Trade-Technical College: teachers feel they are getting "better" students; they know more about the potentials of their students; dropouts have decreased materially; and criticism of discrimination is practically non-existent.

22Crawford, p. 2.
While Crawford's study dealt with post-secondary student selection, little investigation concerning predictive test batteries for secondary vocational pupils has been done. The Crawford study indicated that improved selection techniques can minimize dropouts and place a higher percentage of graduates in the field for which they are training. "The fact that most vocational/technical programs are more expensive to operate than traditional academic programs makes the economic aspects of this study especially important."23 The areas of machine shop and electrical shop were used in a two and a half year study by Miller in several Connecticut high schools.24 An attempt was made to form a battery of predictive tests to provide counselors with a more reliable identification tool for vocationally talented students. The results indicated that each test had some degree of predictive value in examining potential for trade competency in the two study areas, but definite conclusions could not be made because of the short time period.

This same study was renewed a year later25 to develop two selection/prediction instruments: (1) a combination structured interview


24 Miller, passim.

25 Grieve, passim.
and interest inventory, and (2) a teacher rating scale (in form of a checklist) and profile sheet. Although no definite conclusions were formed since further experimentation and standardization were needed, the review of research included in Grieve's study was very revealing in presenting the following general conclusions: (1) there has been a limited research effort in this area, particularly for secondary trade programs; (2) reports of effective prediction of vocational success through use of standardized tests such as the DAT or GATB are not conclusive or only apply to some trade areas; (3) the use of interest inventories as predictors has shown inconclusive results; (4) the applicability of school grades seems doubtful without extensive structuring to the prediction of vocational success; and (5) little research has been done with the structured interview or teacher ratings and checklists. The same review also made conclusions concerning procedures: (1) Most states are without policy in this area--local systems use their own; (2) little or no prediction of student success is being attempted at the eighth through tenth grade level; and (3) where standardized tests are used for entrance into training programs, the scores appear to be used as a basis for screening rather than prediction.

Summary

As indicated by the review of the literature, many people have attempted to investigate various criteria which might have important
predictive value for students who are seeking admission to various vocational training programs. "Knowledge about the individual student factors which make for 'success' in vocational programs is obviously of great potential value to educators and employers." But the state of that knowledge is disappointing. Jerome Moss, Jr., Codirector of the Minnesota Research Coordinating Unit for Vocational Education, has said,

Much work has been done, but specific predictions are mainly inefficient and generalizable results are scarce. There is presently more to be learned from past failures than there is to apply to the conduct of guidance and selection programs.

While many studies successfully identified certain selected variables as predictors, few reported whether the predictors identified were actually adopted and successfully utilized and, as indicated by Stock and Pratzner, it is important to know whether utilization of the data from such studies actually made a difference in outcomes. Of the thirty-one studies reviewed by Loudermilk and Diminico, too many did not attempt to relate to some theory or logical design which would order the results and facilitate

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26 Stock and Pratzner, p. 1.

27 Ibid.

28 Ibid., p. 5.
interpretation. In no case did this author find a system that was usable with the information provided in all and any school system, nor one that objectively documented why the student was placed or not selected. In conclusion, the variety of research findings— their complexity and lack of specificity— led this author to present the Hyde-Scales as a cure for some of these "ills," to see if utilization of the scales would actually predict the differences in performance when those outcomes were measured in terms of student placement in vocational programs and successful performance in terms of job competence. The Hyde-Scale approach is easily adapted to almost all the information used in any school guidance system and, thus, enables the counselor to document his counseling and rationale for placement of each student.

\[29\] Loudermilk and Diminico, p. 73.
CHAPTER III

METHOD OF PROCEDURE

Population and Sample

TARGET POPULATION: In general, the target was any population of potential vocational students who have made a choice of a vocational program they can profit by, or, after initial selection of those students, other students who wish guidance help on what vocational program to enter. In Ohio, projections for 1972-73 indicated some 160,000 high school youth enrolled in vocational education. More specifically, the study was aimed at that group of potential vocational students in Ohio applying for a program approved by the Division of Vocational Education under the following areas: Agriculture, Business, Distributive Education, Home Economics, and Trade and Industrial.

SAMPLING UNITS: The schools used in this study were schools with which the author has been closely associated in developing their Hyde-Scale approach for many of their taxonomies, and schools in which all vocational programs use the Hyde-Scale placement approach. These schools were asked to participate in the study and expressed willingness to cooperate with the author.
The student sample, basically, was a matter of self-selection. The students involved were those who, after some counseling and exposure to whatever introduction to vocational programs was offered by the individual schools, selected or indicated a particular vocational program in which they wished to enroll. The sample number involved at the three schools tested totaled approximately 400, of which 370 were finally used by the end of the academic year (due to withdrawals, etc.).

SAMPLE RATIONALE: The school systems of which the sampling units were a part were those schools which use Hyde-Scales for selecting and were willing to participate in the analysis. It was also necessary that the schools selected did not duplicate identical school situations (qualities needed for external validity). These different school characteristics used in establishing the external validity of the study were:

(a) Schools

(1) Barberton High School, Barberton, Ohio
   Northern Ohio - industrial city - innercity school - comprehensive high school

(2) Lancaster High School, Lancaster, Ohio
   Southern Ohio - suburban city - comprehensive high school

(3) Muskingum Joint Vocational School, Zanesville, Ohio
   Eastern Ohio - combination of 13 feeder schools from a 4 county area, ranging from innercity to remote rural

The seven program areas tested in the three systems listed above
were Auto Mechanics, Cosmetology, Drafting, Occupational Work Experience, Stenography, Distributive Education, and Child Care.¹

The program areas were selected by a committee of guidance counselors from the schools involved relative to their commonality (common availability) at the three schools as well as for their variability of basic aspects directed toward external validity as listed below:

(b) Program generalization

(1) Trade and Industrial: Auto Mechanics, Cosmetology, Drafting

(2) Home Economics: Child Care

(3) Business: Stenography

(4) Distributive Education: D. E. Co-op

(5) Disenchanted: Occupational Work Experience

(c) Sex

Boys: Auto Mechanics, Drafting

Girls: Cosmetology, Child Care

Combination: Distributive Education, Occupational Work Experience

(d) Academic ability level

High: Drafting

Low: Occupational Work Experience

¹Child Care is not offered at Barberton High School.
(e) Type of vocational program

Day trade: Drafting, Auto Mechanics, Cosmetology

Co-op: Distributive Education, Stenography

Work experience: Occupational Work Experience

(f) Other rationale

Those programs having the largest number of students enrolled and applying for enrollment in Ohio each year.

Those programs offered in common at the three schools (exception: Child Care).

Design

The students involved in this study were not aware of their participation in a test case. The instructors were also unaware of their real role in the study; they felt that the new selection system was just a change of procedure and did not know that they would be asked to rank their students at the end of the year.

The design was predictive (correlation) with rank order correlation used to evaluate the Hyde-Scales' predictive abilities. The counselor was to rank students before he applied the Hyde-Scales so that contamination by knowledge of the student's score did not influence the guidance department's ranking. Within broad limits of definition, the independent variables were those variables selected as predictors of student performance (Hyde-Scale score and the counselor's prediction). The
dependent variables were those indicators of performance (the grade average for that course).

The instruments (rating scales) were developed by the guidance department of each school with the author's help and included the teachers' input and, finally, the administrators' scrutinization and approval. The scales were constructed for each program in each school by the guidance personnel, using the criteria available to that school, and weighting each criteria with the help of the instructor in that program and with point values assigned on a dual scale or Hyde-Scale approach. Since all schools did not have exactly the same information available (e.g., Differential Aptitude Tests were used in place of the General Aptitude Test Battery at Barberton), the scales were not identical, but did meet the specification that the Hyde-Scale design dictates.

**Data and Instrumentation**

The data collection procedure occurred in the order following:

**Late 1971-72 school year**

(1) The counselor ranked the students that had selected each of the programs being investigated. This was done by the counselor's ranking

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2 See Chapter IV for discussion of scales or Appendix A for samples.
each of the students in each of the program areas relative to the counselor’s prediction as to success of the student in that vocational program.

(2) The counselor applied the appropriate Hyde-Scales to the groups applying for each program. This score gave each student a rank predicting his success in that vocational program and an indication of the students that would be placed. From this point on the study dealt solely with those students who were selected.

At the end of the 1972-73 school year

(3) After approximately 800 hours of exposure between students and the instructor in the day trade programs, the instructors were asked to rank the students in their programs relative to the instructor’s desire to employ that student (i.e., which student the instructor would wish to employ first, second, etc.).

(4) The instructors were also asked to rank the students in their programs as to the student’s academic performance in that subject based on his grade average for that year.

Analysis of Data

May, 1973

The data application was as follows:

The four basic variables tested were the Hyde-Scales (H-S), the counselor’s prediction (C-P), the student’s job projection (J-P), and the
student's grade average (G-A). There were also two combination variables, one made up of the predictive variables H-S and C-P to form (H&C), and one made up of the performance variables J-P and G-A to form (J&G).

All six variables were correlated with each other. To accomplish this, two computer runs were used so that the first run with the four basic variables would give an average without the further help of the combination of variables. The second run correlated all variables including the two combined variables so that the predictive versus the performance could be evaluated with each variable.

The data was evaluated with (1) the Spearman rank correlation and (2) the Kendall coefficient of concordance. The computer formulas for the above are:

To determine the Spearman Rank Correlation Coefficient called rho (\( r_s \))

\[
rs = 1 - \frac{6 \sum d_i^2}{N^3 - N}
\]

where:
- \( N \) = subjects
- \( d_i \) = difference between ranks of the variables

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4 Siegel, p. 231.
To determine the Kendall Coefficient of Concordance (W)

\[ W = \frac{s}{1/12K^2(N^3-N)} \]

- \( S \) = sum of squares of the observed deviations from the mean of \( R_j \) (the sum of ranks)
- \( K \) = number of sets of rankings
- \( N \) = number of individuals ranked
CHAPTER IV

CONSTRUCTION AND USE OF THE HYDE-SCALES

Introduction

The scales for each vocational program tested at each of the participant schools were derived by working with the guidance office and teachers of the subject areas. These individuals at each school worked to refine and set up definitions relative to the various vocational areas using the information available, the past method of selection in that school, and the objective approaches that the scales made available.

The object of explaining the construction of the scales used at the trial schools is to show how any school might construct its own scales, adapting them to its needs and philosophies of student selection in vocational programs. The final scales are presented here with the following description of how to use the scales and how to modify them to fit the information and philosophies of the local situation.

Determining Criteria

The first thing done was to make a list of the criteria by which the students had been or were going to be judged. The first criteria considered were those areas that were equally applicable to the battery of vocational
programs. The characteristics evaluated had to be measurable criteria and the necessary information had to be available for all students who were to be pre-screened. Such areas were:

1. Grades
2. Attendance
3. Attitude
4. Mental Level
5. Program Interest
6. Certain Standardized Tests

NOTE: It may help the reader at this time to scan the sample scales contained in Appendix A.

The specific criteria selected for the six vocational areas had some common to all programs; for instance, in one school grades, attendance, attitude, mental level and responsibility seemed to fit each program as important criteria.

Certain programs called for specific measurable abilities which were added to that particular selection sheet. (For example: employability for Distributive Education, a co-op program; numerical ability for Drafting; language usage for Clerk-Stenography.) All data calling for particular aptitudes or abilities (e.g., manual dexterity, reading comprehension or abstract reasoning) were obtained from the General Aptitude Test Battery (GATB), ¹ Differential Aptitude Test or other standardized test of this type.

¹In recent opinions published in Ohio and substantiated by the author's research, the GATB is not to be used for selection but as a part of the total selection picture that these scales give for advising a student on his career (Refer to Letter #2, Appendix C, pp. 113-114).
A score for mental level was derived from the California Test of Mental Maturity or other standardized I.Q. test.

In developing criteria the scales range in number from seven scales (criteria) to as many as ten. In addition, where applicable, a particular program might list "recommended" courses. Selection of these subjects depended on the particular service for which students were being considered. For example, a student being considered for Auto Mechanics may lose points or receive "bonus points" for a course in Algebra or Mechanical Drawing, while one interested in Drafting would lose points for not having a course in Algebra or Geometry. This practice enhanced the selection of such students without the restrictive effort which "required" subjects might have had. (It would seem that the scales are more easily usable if every scale totals 100 points. Comparison of scores, then, is much easier for guidance of the student. Therefore, adding or subtracting points for subjects taken or not taken seems to be the best approach.)

Some of the areas such as Responsibility, Attitude or Neatness, due to their subjective nature, required the use of a supplementary sheet (See Appendix A, pp. 101-102 for sample Teacher's Recommendation Sheets). On these sheets teachers who had had the students being rated recorded their recommendations and opinions which then were collected and averaged by the guidance department and the subject teacher to arrive at a rating for
each student in each of these subjective areas. Note that each criteria on the scales had a cue letter to indicate who was involved in the evaluation process of that item. (I.e., G = guidance; T = teacher)

Point Values

Point values (i.e., relative weighted importance) were assigned to each criteria. (For example: Grades, 10 points; Attitude, 15 points; Attendance, 15 points; etc.) The total number of points assigned to any selection sheet was not important so long as the relative value of each criteria had been critically considered and carefully selected; however, as previously mentioned, converting the final set of scales to 100 points proportionately seems much wiser. For example, in comparing the scales for Clerk-Stenography (Lancaster) with those for Drafting (Muskingum), one will note that Numerical Ability is given a maximum of 5 points in Clerk-Stenography but could receive up to a maximum of 15 points in Drafting. This is only one example of the careful consideration given by each vocational program to the criteria most relevant to the student's success in that program, and to the relative value of individual criteria. To repeat, originally the total number of points used on a sheet had no meaning; it was the relative division of the points among the criteria which demanded careful determination. However, in the final analysis with the guidance personnel of the participating schools, it was concluded that a final revision of the scales
by percentage to allow them to become 100 point scales (minus the indicated points for courses not taken) made them more valuable in guiding the student when several areas of student interest were compared.

**Construction of the Hyde-Scales**

Once the criteria and weighted values were established, it was then necessary to break the criteria down into their descriptive terms (times absent, age in years, percentiles, etc.) which became the numerators or top portion of the scales. Numerators could be expressed as percentiles, stanines, or any other form of desired information, but the scale construction remained the same. The denominators were usually linear (numbered consecutively upward or downward depending on the item and the desired values—though it is perhaps advisable to keep the highest value toward the right side of the scale simply to maintain consistency). These values were assigned by the counselor and the vocational staff of each program.

Example I shows the construction of a scale for Attendance where the denominators followed the usual linear pattern.
The more often a student had missed school, the less credit (points) he received for this particular criteria rating. For perfect attendance he received the maximum allotment of points, in this case fifteen. The numbers of the numerator scale and the denominator scale increase and decrease consecutively and were, therefore, linear in nature.

However, in some cases these scales are not the normal linear versus linear (numerator and denominator increasing or decreasing in a constant relationship). Example II shows the construction of a scale for the criteria, Grades.

Example II

In this example, on the top scale the grades were arranged in their normal order. The grades could be in letters or points, depending on the method used to record the student's total grade average in each particular school's grading system (e.g., A = 4 points, B = 3 points, etc.). Note that on the bottom scale the progress begins at 0 points for an "F." In some cases it did happen that when selecting for a particular program, an even distribution of point values along the bottom scale would not adequately identify the characteristic being measured, if "A" were the maximum selection and "F"
the minimum. It was not desirable in skill areas to completely reverse this either--where "F" would be maximum and "A" the minimum. Instead, as in the example, the grade "B" might be the maximum.

When it was desirable to penalize students at both ends of a particular spectrum, the Hyde-Scale permitted the awarding of points in descending value from both sides of a predetermined segment of the scale. (Note Example III where on a Mental Level rating, the I.Q. level being aimed at was between 80 and 90.)

In such cases, the point values were staggered, concentrating the greatest value at the point deemed most important by the instructors and guidance personnel for that particular program. Since in Example II the desired letter grade average being scaled was for that of a Child Care student, the points toward selection increased from "F" equals zero to the grade of "B," then decreased to the end of the scale. This point staggering was easily applied to the other vocational areas. Where instructors felt that the really bright student might not belong in their program, the Hyde-Scale offered an easy weighting method that may consistently distinguish "A" from "B" candidates, as in Example II.
Each of the programs was considered with a different weight; for example, the final weighting in Auto Mechanics (Muskingum) being greatest at the C level (10 points), with declining points toward selection between the B and C⁻ levels. In this case there was a general consensus that the C or C⁺ student could best benefit from the Auto Mechanics program. In Child Care, the scale was slightly higher with B and B⁻ receiving 5 points and C and A receiving 3 and 4 points respectively. Again, these decisions were subject to the local school situation and were adjusted to fit the philosophy and concepts for students in that school system, and were based on the feeling by some guidance people that the student with higher grades might not care for the level of curriculum presentation in certain areas and perhaps become bored.

Another example of the point staggering is shown in Example IV, a Mental Level scale. In this case, the scale had an assigned value of 10 points, but it was constructed so that the intervals on the lower scale were smallest and reached the highest point value toward selection between the 100-105 I.Q. level on the top scale. In other words, the students scoring
in the 100 to 105 I.Q. range were considered to be those most likely to be successful in this particular vocational program. Again, this implies that those students scoring above 105 (as in the case of the "A" student) could possibly become bored, while those students with decreasing scores below 100 would find the work increasingly difficult and often, therefore, were screened out by the guidance department.

The weighting, the points for each criteria and, in many cases, where the points were weighted (e.g., whether the maximum ten points were given for 100-105 I.Q.), were decided by a group including teachers, guidance personnel and, where possible, the administrative personnel concerned at the local and possibly state level. Teachers involved in these decisions were made aware of the danger of their own instinct to place maximum stress on "A" level students. This would happen particularly in the case of the Grades and Mental Level criteria. A constant effort had to be made by teachers (and guidance people) to keep in mind who and what each class was designed for in their system.

It was very important that the school's administrative people, guidance people and teachers were all included in participating in and understanding the system that was developed. The working together in developing some sort of a set system of student evaluation and selection caused many other positive effects throughout the school as the teacher and administrator realized that they, too, were part of the selection system; it was their system, not just the
guidance personnel's exclusive property. However, once the opinions were collected, the guidance staff developed the final rating sheets and they were the only ones, except in cases where the sheets were questioned, who worked on and completed the scales.

**Selectivity**

To be of any value to the selection group each criteria had to be selective--more than one or two points (a wider range) between the scoring of the best and worst students. This was achieved by determining the probable area of highest student distribution (where the majority of students' scores would fall) and making smaller intervals in this area on the denominator or bottom scale. The smaller deviations caused a greater difference in point values, hence, increasing the selectivity of that item. (Refer to Example V, 60-80 percentile.)

![Example V](image)

What this meant was that the smaller intervals of the bottom scale were moved along the scale to meet the distribution of student scores for a particular program and school. The selectivity of each criteria was
increased by narrowing the divisions in the denominator where the greatest number of students’ scores fell. (Example VI -- Ex. V with a graph superimposed showing distribution curve of students' scores.)

![Distribution curve of students' scores](image)

### Recording Selection Scores

The scales were designed to incorporate as much objective material as necessary. Most of the information requested was entered on the scales directly from the student’s record. Data processing methods could make this even simpler, but secretarial help could easily enter most of the requested data by placing a checkmark at the correct point on the top scale as the student’s records were reviewed.

There were several subjective sections or criteria where subjective opinions were needed, and a space for such comments or explanations was provided at the bottom of each sheet.

Originally the scales might be criticized for being too objective and for not taking into account the many subjective areas a good counselor may
use when selecting as, for example, the student’s home situation. However, it was later shown that the teacher and counselor had several conferences with prospective students and took note of special circumstances, considering all the many subjective items before their final assignments of points toward selection in their criteria (re: counselor recommendation).

To obtain an interest rating for the student (e.g., interest in the Cosmetology program), a teacher interview with the student determined whether the student’s interest in the program was considerable or slight, or somewhere between the two extremes. The interest area was also augmented by the counselor and by reviewing scores on the Ohio Vocational Interest Survey (O.V.I.S.) where, in each case, several areas relative to that service are listed. For example, students interested in the Child Care program would normally show above average interest in the O.V.I.S. area 011, 120 and 220 which are areas showing interest in caring for people (011), instructing people (120), and entertaining others (220). The percentile ratings for each area (e.g., 010, 102, 110, etc.) were considered and then combined with the teacher and counselor’s ratings and an average placed on the scale to help in giving the student his selection points for his interest in that area. If the O.V.I.S. (or its equivalent) scores for students were available, this method was used; if not, determining the student’s interest by guidance and teacher interview alone attempted to serve where interest was used in the evaluation procedure.
Although many school systems would use days absent in evaluation of students, it should be noted that "Times Absent" under Attendance on some scales did not mean number of days absent but the number of absences during the school year (or the average over a two-year period if the school system would prefer). A student might have missed ten days of school because of a car accident, but this would be counted as only one time if the days absent were consecutive. This procedure again was subject to the will of the local school system and was determined by the availability of information, as were Grades (whether grades were averaged for that year or for all previous years in high school). But so long as the policy and procedures were consistent within a school, the system for all students was relative and fair.

If, in a rare case, a student had a particular area missing because of unreported data, he was given the average score of all the students who were applying for the particular program. In this way, missing data did not help or penalize the student.

Several of the rather subjective areas not available from data were found from teachers' recommendations and evaluations. Each student had a Teacher's Recommendation or Evaluation Sheet sent to as many teachers as possible (teachers, of course, who were familiar with that student). On this sheet the teachers were asked to rate (on a scale ranging from 0 to 100 percent) some traits of the student such as: his ability to work well with others (relative to percent of time he worked well with others), responsibility
(percent of time he was dependable), general health, and neatness. These recommendations were then averaged for each particular criteria (again, to increase validity) and a consensus rating entered on the final scale. The advantage of explaining the vocational program to the academic instructors, as well as making them a part of the evaluation system, cannot be over-emphasized.

In the very subjective area of "Attitude" the Barberton school system has found, over the past several years, that averaging teachers' opinions of the student's attitude has the highest correlation with the student's achievement in his vocational area.\(^2\)

**Final Placement**

When all candidates' records were completed and the points from each criteria totaled, the scores were placed in rank order and final recommendation was made on the basis of total points scored. Using the students' scores, if so desired, one could simply count down the list from the highest score until the desired number of entrants matched the program's openings. So long as a limited number of students were being selected from a larger total, these criteria seemed to offer a most objective method of predicting success as well as recommendation for placement.

Early Validity

Where necessary, revisions were made after a rough draft for each vocational program was ready by having the instructor of a program rank the program's senior students, beginning with the best to the worst, in accordance with the program objectives. This column was then compared with the same students ranked by their scores on the Hyde-Scale Selection Sheets and the scales and each criteria evaluated relative to the correlation between the two columns. To increase the validity, certain criteria were then reweighted through an item analysis and the correlation checked again. However, once in use, further study to correlate rating scores on the scales with job performance years later could determine whether the scales also predict success in job performance as well as in the classroom.

Physical Construction

The Scales may be drawn at twice size (8 inches) by the drafting class (See Appendix A, p. 90) and then, after numbering, etc., reduced photographically to make a sharper scale, where this equipment is available (as in a printing program). Otherwise, each scale should be four inches long with extensions about 3/8 of an inch above and 3/8 of an inch below, including the hash marks and numerical values. This standardization allows for easy changes, as well as interchanging of criteria from one program's selection sheet to another's.
Several copies of a particular numerator scale may be made and
different denominator segments or different values used for several other
criteria. See Appendix A for samples.
CHAPTER V

ANALYSIS OF THE DATA

Collection of the Data

As the data was collected at each of the participating schools, the information was recorded on Hyde-Scale Data Collection Sheets. One column showed the counselor's ranking, performed during March-April, 1972. The counselor ranked all students who applied for a program using whatever methods (criteria, etc.) the guidance department at his school had previously used for placement in that vocational program. Although many programs had previously not used a ranking method, the guidance personnel agreed to do this for their own interest and research value.

Other columns were used to record the students' scores and rankings as a result of the application of the Hyde-Scales in May, 1972. The counselor used the appropriate scale developed for each of the various programs using the amassed student data and ranking the students by their score. Ties were to be reranked by the counselor when necessary.

In April of 1973 the instructor who had had these students for the academic year was asked to rank the students in his class by his judgment as to who would make the best employee; i.e., the student ranking number

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one would make the best employee, etc. This information or job competency rank, was recorded in another column.

The last column showed the students' grade rank based on the academic grade average for that taxonomy for the 1972-73 academic year (done by instructor in April, 1973).

Tabulation of the Data

When the data sheets were submitted by the various schools, the student rankings in a few cases needed to be adjusted because of student withdrawals during the year. Also, in some cases, student grades had been submitted only as grade point averages and had not been ranked. After making these corrections, the data from the twenty sheets was transferred to seven sheets (one for each taxonomy) to facilitate the punching of computer cards for each student (Sheets in Appendix B, pp. 104-110). These sheets relisted the students (sans identification) at each school for each taxonomy ranked first by their Hyde-Scale Score (first column). The next three columns listed their ranking according to the counselor's prediction, the student's projected job performance, and his grade average for the vocational subject (Columns C-P, J-P, and G-A). A computer card was punched for each student, listing his rankings in this same order.

A computer program was prepared so that the results would show the correlation of all variables with each other and all others according to the
Spearman rank order correlation. The rank order correlation method was the only fair way to compare the variables since the three schools had not used exactly identical scales and, therefore, could not fairly compare students' scores. The Spearman formula is the most widely accepted method for determining the correlation when variables are listed in terms of rank order. The computer was also programmed to read out the coefficient of concordance, the correlation with concensus, and the significance. (For definitions of the above terms, consult pp. 55-56.) This computer run established the average correlation, the coefficient of concordance, and the correlation of concensus for the four basic variables (Hyde-Scale score, counselor's prediction, job projection, and grade average).

In addition, a second program was run to establish the combination of the predictive variables and the performance variables, and the correlation with concensus of the combined variables. This new data is shown in columns 5 and 6 for each school (data sheets, Appendix B, pp. 104-110).

Column H & C represents a ranking based on a combination of the Hyde-Scale score and the counselor's prediction (the predictive variables). The two original rankings were added together; then these new totals were ranked to give a predictive rank, H & C, the predictive variable.

Column J & G represents the combination rank of the job projection and the grade average (the performance variables). These ranks were
obtained in the manner already described, giving a ranking for J & G, the performance variable.

Tied ranks were assigned the average of the ranks which would have been assigned had no ties occurred.¹ This new data was added to the computer cards for all students for a second run. The combined variables in the second run were not included in the table for the consensus or average correlation or the coefficient of concordance since they are simply repetition of already present variables and their inclusion a second time would have unfairly raised the previously mentioned statistics.

For purposes of better understanding the discussion and tables which follow, the following definitions are included:

CORRELATION (C) -- the amount of relationship that exists between the ranking items being compared. A perfect correlation is represented by 1.00 and, conversely, .00 represents no correlation at all.

SIGNIFICANCE (S) -- the number of times out of 100 that the relationship which exists could have been due to chance. The acceptable level of significance for this study was set in the proposal at the .05 level (or 5 chances out of 100 that the correlation was due to chance), indicating that any results ranging from .00 to .05 would be considered significant.

CORRELATION WITH CONSENSUS (T) -- This score refers to a

¹Siegel, p. 206.
particular variable and its correlation with all the variables. As previously mentioned, the variables H & C (which included the variables H-S and C-P) and J & G (which included the performance variables J-P and G-A) were the combinations that were not included in the first computer run so that the correlation of consensus was not raised by repeating the variables in the total. To obtain the correlation with consensus for H & C and J & G, another computer run was made and only these two scores recorded in the T column (as indicated in the Tables, pp. 60-72, listed by taxonomy).

**CORRELATION AVERAGE (C Av)** -- the arithmetic average of all the correlations of the four basic variables (H-S, C-P, J-P, G-A).

**COEFFICIENT OF CONCORDANCE** -- the relationship that exists among all four basic variables and indicates how the four variables agree. This indicator might be used for comparing the total relationship of the placement process in one school with another.

**Analysis of the Results**

There were certain difficulties encountered by the author in setting up the data for this study. E.g., it is best not to give a "score" to the guidance opinion of how a student will succeed and, in reality, even ranking is a truly difficult chore for the counselor. Even if the counselor's scores could be attained, they could not be equated unless the same exact guidance scoring system had been used and, thus, make the scores comparable between schools.
This again was the problem with the Hyde-Scale scores. Lancaster High School used a 100 point scale for all programs while the other schools have not as yet converted their scales to a standardized point total.

Nonetheless, dealing with these shortcomings as best he could, the author sought by ranking to achieve at least the following aspects in his study:

(a) to establish the Hyde-Scale correlation with the performance variable (combination of J-P and G-A), this to be the most important examination of the study. To discover how the prediction of the Hyde-Scale correlated with the performance (success) of the student during the year and its significance (not due to chance or less than .05). See Table 8, p. 73. Note that the comparison of any of the variables by taxonomy is presented in the Tables on pp. 60, 62, 64, 66, 68, 70 and 72.

(b) to compare the Hyde-Scale ability prediction correlation with the guidance department prediction (by consensus). See Table 9, p.

(c) to give an overview of the taxonomies with the lowest correlations and how the counselor did on his projection in the same taxonomy. See Discussion by Taxonomy, pp.

(d) to compare the combination of the Hyde-Scale and the guidance department (H & C), predictive variables, with the performance variables job projection and grade average (J & G). See Table 10, p.
Discussion by Taxonomy and School

In covering each taxonomy, the ( ) beside each school contains the author's comment relative to the Hyde-Scale correlation to the Job Projection and Grade Average relative to the following scale.

**CORRELATION**

![Correlation Scale Diagram]

**VERBAL EQUIVALENT by H-SCALE**
AUTO MECHANICS
(Trade and Industrial)
Taxonomy Correlation Average for H-S/J&G = .53

Barberton (Questionable and Significant)
Although not a very good start, it should be noted that the guidance department was also fooled in their prediction (.36C/.38C). (For a quick reference of how the Hyde-Scale and the counselor compared in their predictive correlations, see Table 9, p. 75.) With both the counselor and the Hyde-Scale combining to predict, the Correlation increased to .46 with .02 Significance. This would be a satisfactory correlation and makes a strong case for the Hyde-Scale to be used as part of the placement process by the guidance personnel.

Muskingum (Very satisfactory and Significant)
The Hyde-Scale was much better with .53 C and .01 S, with a very good predictive vs. performance (H&C)-(J&G) Correlation of .62 C and .00 S.

Lancaster (Excellent and Significant)
These results made Auto Mechanics a much more acceptable taxonomy with an outstanding .71 C of Hyde-Scale and the performance criteria (J&G).
**Spearman Correlation**

H-S = Hyde-Scale  
G-A = Subject Grade  
C = Spearman Correlation  
C-P = Counselor Prediction  
J-P = Job Projection  
H&G = J-P & G-A  
S = Significance  
T = C with CONSENSUS

**School: Barberton H. S.**  
**Number of Students:** 21

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Table 1
CHILD CARE

(Home Economics)

Taxonomy Correlation Average (H-S/J&G) = .68

Barberton

This taxonomy is not offered at Barberton.

Muskingum (Excellent and Significant)

This was a strong area. The Average Correlation was a very strong .70, indicating that the Hyde-Scale and all variables were very much together.

Lancaster (Excellent and Significant)

Finishing the Home Economics area was the strong Hyde-Scale Correlation of .70 with the performance variables. Of interest was an unusual dichotomy with the counselor's prediction being only a .27 Correlation.

Since this Child Care was the only Home Economics area tested, the indication would be that placement by use of the Hyde-Scale in the Home Economics area is very positive.
**TAXONOMY:** CHILD CARE

**Spearman Correlation**

- **H-S** = Hyde Scale
- **G-A** = Subject Grade
- **C** = Spearman Correlation
- **S** = Significance
- **T** = C with CONCENSUS

**SCHOOL: (not offered at Barberton)**

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**NUMBER OF STUDENTS:**

- **C average:** 70
- **Coefficient of Concordance:** 0.70
- **S:** .000

**SCHOOL: Muskingum JVS**

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**NUMBER OF STUDENTS:** 16

|          | C average: 62 | Coefficient of Concordance: 0.65 |

**SCHOOL: Lancaster H.S.**

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**NUMBER OF STUDENTS:** 20

|          | C average: 55 | Coefficient of Concordance: 0.66 |

**Table 2**
COSMETOLOGY
(Trade and Industrial)
Taxonomy Correlation Average (H-S/J&G) = .59

Barberton (Good and Significant)

This seemed to be a very good area for the Hyde-Scale with nothing unusual appearing in the statistical analysis.

Muskingum (Questionable and Significant)

The Average C of .38 indicates that very little was working. In this case the Hyde-Scale did correlate higher than the counselor prediction, .40 to .29 respectively.

Lancaster (Superior and Significant)

Making the total taxonomy much stronger was the Hyde-Scale Correlation of .77 with performance, and a predictive variables Correlation of .70 with the performance variables.
TAXONOMY: COSMETOLOGY

Spearman Correlation

\[ H \cdot S = \text{Hyde Scale} \quad G \cdot A = \text{Subject Grade} \quad C = \text{Spearman Correlation} \]
\[ C \cdot P = \text{Counselor Prediction} \quad H \& C = H \cdot S \& C \cdot P \]
\[ J \cdot P = \text{Job Projection} \quad J \& G = J \cdot P \& G \cdot A \]
\[ S = \text{Significance} \quad T = C \text{ with CONSENSUS} \]

**SCHOOL:** Barberton H. S.   **NUMBER OF STUDENTS:** 22

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C-aveage: .63  
Coefficient of Concordance: .72  
S .000

**SCHOOL:** Muskingum J V S  **NUMBER OF STUDENTS:** 18

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C-average: .38  
Coefficient of Concordance: .53  
S .004

**SCHOOL:** Lancaster H. S.  **NUMBER OF STUDENTS:** 16

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C-average: .65  
Coefficient of Concordance: .74  
S .000

Table 3
DISTRIBUTIVE EDUCATION

(Distributive Education)
Taxonomy Correlation Average (H-S/J&G) = .62

Barberton (Excellent and Significant)
A solid Hyde-Scale Correlation and a Correlation difference
between H-S and C-P of +.21.

Muskingum (Satisfactory and Significant)
A weaker scale with no apparent strengths or weaknesses
indicated statistically.

Lancaster (Excellent and Significant)
A Correlation of .74 between Hyde-Scale and performance leaves
little to change. The combined prediction (H&G) vs. performance (J&G)
Correlation was also excellent -- .70.
### Spearman Correlation

**TAXONOMY:** DISTRIBUTIVE ED.

**H-S** = Hyde-Scale  
**G-A** = Subject Grade  
**C** = Spearman Correlation  
**C-P** = Counselor Prediction  
**J-P** = Job Projection  
**H&G** = H-S & C-P  
**J&G** = J-P & G-A  

#### School: Barberton H.S.  
**Number of Students:** 21

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**C average:** .54  
**Coefficient of Concordance:** .65  
**S:** .000

#### School: Muskingum JVS  
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**C average:** .53  
**Coefficient of Concordance:** .65  
**S:** .000

#### School: Lancaster H.S.  
**Number of Students:** 28

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<th>G-A</th>
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**C average:** .67  
**Coefficient of Concordance:** .75  
**S:** .000

**Table 4**
DRAFTING

(Trade and Industrial)

Taxonomy Correlation Average = .76

**Barberton** (Good and Significant)

A strong correlation and an apparently solid Hyde-Scale.

**Muskingum** (Superior and Significant)

A rather unbelievable .89 Correlation for the Hyde-Scale. In fact, a C Average of .88 and Coefficient of Concordance of .91. In checking the computer printout on the Concensus of the first five ranks, they were numbered exactly 1 through 5. In other words, the first five positions were exactly correct when the Concensus of the four variables was consulted.

**Lancaster** (Superior and Significant)

Completing the strongest area of the scales was another very superior .80 Hyde-Scale Correlation with performance. The author would like to think that since this area was his own skill area, his interest and extra attention and effort may have been a help to the Drafting scale's getting a jump on the other scales and, thus, sincerely feels that this correlation is an indication of what can be done with enough study and several revisions of the existing scales.
### Spearman Correlation

**TAXONOMY:** DRAFTING

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<th>G-A</th>
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<td><strong>S:</strong></td>
<td>.000</td>
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<th>C-P</th>
<th>J-P</th>
<th>G-A</th>
<th>H&amp;C</th>
<th>J&amp;G</th>
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Table 5
OCCUPATIONAL WORK EXPERIENCE
(Supervised by Trade and Industrial)
Taxonomy Correlation Average = .46

Barberton (Satisfactory; Not significant -- .08)

Since O.W.E. is an ungraded program, there were already some students in the class (from the previous year). Consequently, only a small number of new students were chosen using the scales, and some of these students, due to movement and the nature of the program, did not have complete data. The author thought that this area was not sufficient enough to warrant any relevant discussion, although the Hyde-Scale Correlation was .10 better than the counselor's.

Muskingum (Questionable; Not significant -- .15)

For the same reason as above there was not sufficient relevant information to discuss other than to indicate that the guidance department only used the scales to determine if the student fit the program criteria. They used the scales to help identify the students based on the fact that the scales are included as a part of the State Guidelines for O.W.E.

Lancaster (Satisfactory and Significant)

This was a single unit totaling 18 students, but gave a pretty fair indication that an inverse scale approach to the non-skill area (see Chapter IV, p. 42) can be adapted. As state supervisor of this program, the Hyde-Scale .50 and Significance of .02 does not seem to the author to be too bad for a first year approach to this unskilled area of placement.
**Spearman Correlation**

H-S = Hyde Scale  
G-A = Subject Grade  
C = Spearman Correlation  
C-P = Counselor Prediction  
J-P = Job Projection  
H&C = H-S & C-P  
J&G = J-P & G-A  
S = Significance  
T = C with CONCENSUS

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<td>J&amp;G</td>
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<td>T</td>
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</table>

* Counselor did not rank these students previous to selection.
STENOGRAPHY

(Business and Office Education)
Taxonomy Correlation Average = .54

Barberton (Meaningless and Not significant)

This was the exception in an otherwise strong area. The Hyde-Scale Correlation was meaningless and the author feels that the fault may lie in the scale construction since the other programs in this taxonomy support the Hyde-Scale in a very strong manner. The only consoling aspects were the Hyde-Scale Correlation with the guidance department of .65, and the fact that the stenography teachers felt the selection procedure had improved their classes. In fact, they were very happy with the results.

Muskingum (Excellent and Significant)

A complete turnaround from the Barberton results and again a very superior .84 Correlation with the guidance personnel.

Lancaster (Superior and Significant)

A very strong finish with a Hyde-Scale C of .77 with J&G. Interestingly, the counselor prediction Correlation of .37 was far below the Hyde-Scale Correlation in this school.

For an overview of the Correlation by services and taxonomies, see Tables 11 and 12, p. 78.
**TAXONOMY:** STENOGRAPHY

### Spearman Correlation

- **H-S**: Hyde-Scale
- **G-A**: Subject Grade
- **S**: Significance
- **C**: Spearman Correlation
- **H & C**: H-S & C-P
- **J & G**: J-P & G-A

#### Barberton H. S.

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- **C-avg**: .43
- **Coefficient of Concordance**: .58

#### Muskingum J V S

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- **C-avg**: .71
- **Coefficient of Concordance**: .79

#### Lancaster H. S.

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- **C-avg**: .58
- **Coefficient of Concordance**: .67

### Table 7
Table 8

CORRELATION of HYDE-SCALE WITH JOB-PROJECTION & GRADE AVERAGE

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<th>BARRETT WINGHAM - LANCASTER</th>
<th>AUTO MECHANICS</th>
<th>CHILD CARE</th>
<th>COSMETOLOGY</th>
<th>DISTRIBUTIVE EDUCATION</th>
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C=Correlation (rho)
S=Significance
Correlation of Consensus

Table 9 (p. 75) shows that the Hyde-Scale had a higher Correlation of Consensus in 14 cases while the counselor was higher in four cases. Having a great deal of respect from having worked with the guidance department at the schools involved in this study, the author was very proud of these superior Correlations and the closeness of several of the negative comparisons.

As a credit to both the scales and the guidance department, the author felt that the counselor rankings were not given the same consideration as they might have in the normal selection process. The scales were accepted and used with confidence, and any real responsibility of placement was not dependent on the counselor prediction, since the only reason for this prediction was for purposes of this analysis.

The data for the Correlation of Consensus shows how the particular variables (e.g., H-S or C-P) correlated with all the other variables. However, if just the correlation of each variable (H-S) and (C-P) is compared as it correlates with the performance summary (P&G), the results are exactly the same. If it is arbitrarily set that any difference between the Hyde-Scale and Counselor Prediction of less than .10 is not considered significant, then there were eleven cases where significant differences occurred. Of these eleven, the Hyde-Scale was significantly greater than the counselor in ten cases, and the counselor was significantly greater than the Hyde-Scale only once.
Table 9

**CORRELATION of CONSENSUS**

<table>
<thead>
<tr>
<th></th>
<th>AUTO MECHANICS</th>
<th>CHILD CARE</th>
<th>COSMETOLOGY</th>
<th>DISTRIBUTIVE EDUCATION</th>
<th>DRAFTING</th>
<th>OCCUPATIONAL WORK EXPERIENCE</th>
<th>STENOGRAPHY</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>B M L</strong></td>
<td><strong>B M L</strong></td>
<td><strong>B M L</strong></td>
<td><strong>B M L</strong></td>
<td><strong>B M L</strong></td>
<td><strong>B M L</strong></td>
<td><strong>B M L</strong></td>
<td><strong>B M L</strong></td>
</tr>
<tr>
<td><strong>H-S</strong></td>
<td>.62 .82 .89</td>
<td>-.88 .93 .65</td>
<td>.85 .66 .92</td>
<td>.78 .76 .90</td>
<td>.84 .98 .90</td>
<td>.76 -.71 .62 .88 .89</td>
<td></td>
</tr>
<tr>
<td><strong>C-P</strong></td>
<td>.67 .85 .78</td>
<td>-.88 .67 .76</td>
<td>.51 .77 .73</td>
<td>.85 .78 .66 .94 .67 .72</td>
<td>-.51 .79 .85 .61</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>+</strong></td>
<td>- - +</td>
<td>NA 0 + + +</td>
<td>+ - - + +</td>
<td>+ + + + + NA + - + +</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*+= Hyde-Scale has greater correlation of consensus than Counselor-Prediction

**B** = BARBERTON H.S.

**M** = MUSKINGUM JVS

**L** = LANCASTER H.S.
Table 10

Table 10 (p. 77) shows that the predictive variables (H&C), when compared with the performance variables (J&G), were significant in all cases except:

Muskingum -- Cosmetology and O.W.E.

Barberton -- O.W.E. and Stenography

The combination of the counselor and the Hyde-Scale based on the author's verbal definitions (p. 58) gives the following accounting:

<table>
<thead>
<tr>
<th>Meaningless</th>
<th>No. of Programs</th>
</tr>
</thead>
<tbody>
<tr>
<td>--</td>
<td>0</td>
</tr>
</tbody>
</table>

| Poor        | 2              |
| Questionable| 2              |
| Satisfactory| 4              |
| Good        | 5              |
| Excellent   | 5              |
| Superior    | 2              |

with two Correlations above .90, and an arithmetic Average Correlation of .59, or Good.
Table 10

CORRELATION of HYDE-SCALE & COUNSELOR PREDICTION WITH

JOB-PROJECTION & GRADE AVERAGE

<table>
<thead>
<tr>
<th></th>
<th>AUTO TECHNIC</th>
<th>CHIL CBE</th>
<th>COSMETOLOGY</th>
<th>DISAVANTAGE EDUCATION</th>
<th>DRAFTING</th>
<th>OCCUPATIONAL AVAIL</th>
<th>STECHNOLOGY</th>
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</thead>
<tbody>
<tr>
<td>C</td>
<td>.46</td>
<td>.62</td>
<td>.67</td>
<td>NA</td>
<td>.67</td>
<td>.51</td>
<td>.58</td>
</tr>
<tr>
<td>S</td>
<td>.02</td>
<td>.00</td>
<td>.00</td>
<td>.00</td>
<td>.02</td>
<td>.00</td>
<td>.00</td>
</tr>
</tbody>
</table>

C = Correlation (rho)

S = Significance
Table 11

Correlation Average by Taxonomy for Hyde-Scale versus Job Prediction and Grade Average

<table>
<thead>
<tr>
<th>Taxonomy</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Auto Mechanics</td>
<td>.53</td>
</tr>
<tr>
<td>Child Care</td>
<td>.68</td>
</tr>
<tr>
<td>Cosmetology</td>
<td>.59</td>
</tr>
<tr>
<td>Distributive Education</td>
<td>.62</td>
</tr>
<tr>
<td>Drafting</td>
<td>.76</td>
</tr>
<tr>
<td>Occupational Work Experience</td>
<td>.46</td>
</tr>
<tr>
<td>Stenography</td>
<td>.54</td>
</tr>
</tbody>
</table>

Table 12

Correlation Average by Service for Hyde-Scale versus Job Prediction and Grade Average

<table>
<thead>
<tr>
<th>Service</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business and Office Education</td>
<td>.54</td>
</tr>
<tr>
<td>Distributive Education</td>
<td>.62</td>
</tr>
<tr>
<td>Home Economics</td>
<td>.68</td>
</tr>
<tr>
<td>Trade and Industrial*</td>
<td>.63</td>
</tr>
</tbody>
</table>

Hyde-Scale versus Job Prediction and Grade Average, overall = .62

*Occupational Work Experience is not included in Trade and Industrial since it is not a skill area.
Evaluation of the Guidance Departments

By comparing the guidance department prediction (G-P) with the performance variable (J&G) and taking the mean of these correlations for the six skill areas by school, a pseudo guidance department rating resulted as follows:

- Muskingum - .60 Average C (.60)*
- Lancaster - .46 Average C (.75)
- Barberton - .43 Average C (.48)

*( ) indicates the average Hyde-Scale comparison

A similar examination of the guidance programs was accomplished by taking the schools and ranking them (1, 2 or 3) in each taxonomy according to the Coefficient of Concordance. These ranks were added in each taxonomy to result in a final ranking of the schools. With the lowest rank being desirable, the schools ranked as follows: (1) Muskingum with 10 points; (2) Lancaster, with 12 points; and (3) Barberton, with 16.5 points.
Lancaster High School Correlation of Hyde-Scale
with Job Projection and Grade Average

The Barberton scales were the first ones to be developed and were later used in helping Muskingum to develop their scales. Both the Barberton and Muskingum scales were then used to help in the development of the Lancaster scales. It would seem natural that if any scales would be superior they would be the final scales developed due to the benefit of past experience and added knowledge shared by the other guidance departments during the designing phase of the Lancaster scales. The correlation means, listed in order of Hyde-Scale development, for the skilled areas were: Barberton (.48), Muskingum (.60), and Lancaster (.75). Thus it would seem that each school improved and learned from the others and, therefore, the correlations at Lancaster are shown separately in Table 13, p. 81. They show a correlation mean of .75 (or Superior) for the six skill areas, and this is an indication that other schools, building on the background of the three schools in this study, could even improve on this correlation.
Table 13

LANCASTER H.S.
CORRELATION of HYDE-SCALE WITH
JOB-PROJECTION & GRADE AVERAGE

<table>
<thead>
<tr>
<th></th>
<th>Auto Mechanics</th>
<th>Child Care</th>
<th>Cosmetology</th>
<th>Distributive Education</th>
<th>Drafting</th>
<th>Occupational Work Experience</th>
<th>Stenography</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>M</td>
<td>L</td>
<td>B</td>
<td>M</td>
<td>L</td>
<td>B</td>
</tr>
<tr>
<td><strong>C</strong></td>
<td>.71</td>
<td>.70</td>
<td>.77</td>
<td>.74</td>
<td>.89</td>
<td>.80</td>
<td>.50</td>
</tr>
<tr>
<td><strong>S</strong></td>
<td>.00</td>
<td>.00</td>
<td>.00</td>
<td>.00</td>
<td>.00</td>
<td>.00</td>
<td>.02</td>
</tr>
</tbody>
</table>

Lancaster Correlation Average for the Six Skilled Areas: .75

*C=Correlation (rho)
*S=Significance

*Muskingum Drafting was the only taxonomy to have a higher correlation than Lancaster.
CHAPTER VI

CONCLUSIONS AND RECOMMENDATIONS

Summary

Viewing the statistical results as a whole, the author feels that the scales have done a much better job with respect to Correlation and Significance than originally anticipated. There were some individual cases where a student who was ranked rather high by the Scales and/or the counselor did poorly in the class, or cases where the student was predicted as low ranking but did rather well. The cases of exceptional performance after low predictive ranking may be attributed to the student's increased motivation once enrolled in the program. Mr. John Watson, head guidance counselor at Lancaster High School, felt that many times the change from an irrelevant academic curriculum to a relevant vocational curriculum caused students who had scored low on the predictive academic scales to perform well due to the higher motivation in the vocational program. The cases of students' poor performance after high predictive ranking were disappointing but, again, the student's interest in the program and the feeling of relevance that the program offered him may have been factors in determining which way he would progress. Nonetheless, such cases are
obviously the exception rather than the rule and do provide that the counselor, or human factor, must be involved in the use of the scales in their application and interpretation. But even in their present state, without further revision based on item analysis, many of the scales seem to have a high enough degree of correlation to be used in helping provide the information necessary for the student's placement. Even the lowest correlated scale (Stenography at Barberton) was sighted by Mr. Hunter as an area where the teachers were very happy and had taken the trouble to inform him of this relative to the student selection for their area.

Of the various taxonomies tested, it was noted that the Drafting taxonomy showed an unusually high correlation. As mentioned previously, the author's own background is in this skill area and considerably more time was initially spent developing the scales for this vocational taxonomy. This would indicate that if time could be spent by the best qualified people—those with a trade background in the skill area and the educational background from the classroom plus the guidance experience—the scales for the other taxonomies could also approach the high correlation of the drafting area.

The author's confidence in the scales is such that as a director, for which he is certificated by the State of Ohio, or superintendent of a vocational school he would definitely feel justified in using these scales for placement. He would insist that they be used, feeling that he could through
use of the scales better understand and work with the guidance personnel to
develop a placement and selection program that would objectively as possible
benefit the person of most interest in this study—the student (who I hope will
always be the number one beneficiary of this type of study).

The survey of related research (Chapter II) was convincing in its
failure to find one particular system evaluated on some particular commercial
test that can do the job of student placement. Even Project Mini-Score, an
extensive six year project (1965-1971), concluded that there was no single
instrument proven to be most effective. Those instruments that were the
most successful involved "measure factors related to interests, personality,
and needs of individuals..."\(^1\) The Hyde-Scale approach, though it is basically
noncommercial,\(^2\) allows flexibility yet is objective and documented in its
approach so that such "measure factors" can be combined by the counselor,
offering a distinct advantage for a guidance program and for the student.

Although cross validity studies suggest that variables in their test
batteries may be predictive of success at other institutions, Crawford states
that they should be validated on groups at each institution or, if possible,

\(^1\)Howard F. Nelson and David J. Pucel, Project Mini-Score Final

Report, Department of Industrial Education, University of Minnesota, 1972,

U.S.O.E. project No. HRD5-0148, p. 62.

\(^2\)An established scale cannot be made at this time unless all stan-
dardized testing is given in all the school systems so that it can be built into

a scale which is commercially available to all school systems.
new weighted battery scores should be developed within the individual institution because "group factors hold only when regression equations are constructed about the criteria in a single institution." This substantiates the author's concept that at present each Vocational Education Planning District should construct its own final version of the Hyde-Scales, revising and standardizing them to suit their own needs.

Conclusions

In reviewing the results of the data and listening to comments from teachers and guidance counselors at a follow-up conference, the author has drawn the following conclusions concerning the value of the Hyde-Scales:

(1) The Hyde-Scales were able to predict student success at a relatively high correlating level. Adding the Hyde-Scale averages for all six skill areas, not including the Occupational Work Experience area, gave a mean of .62 (Table 12). The Lancaster programs had a .75 level including all skill areas.

(2) The Hyde-Scale could outpredict the counselor (as borne out by Table 9); though since the Hyde-Scales were based on information the guidance departments had available in the schools, and in most cases were using, it became evident that the guidance people were doing a good job predicting student success in the programs.

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3Crawford, p. 20
(3) It was possible to convert almost any subjective criteria to an objective criteria by the construction of a Hyde-Scale for that particular admission information.

(4) The working together that was necessary at the inception of the Hyde-Scales' use at each school established much greater rapport between the guidance people, the teachers, and the overall system. This resulted in better acceptance of the students selected for each program by the teacher because he understood the placement process.

(5) The individual instructors were much more satisfied with the selection system based on the guidance counselors' advisement that the Hyde-Scales were capable of objectively predicting student success (in most cases, better than the guidance people were).

(6) Using the Hyde-Scales, the guidance people felt "safer" and more secure having the objective backing that the scales gave them in case they were called to question on a particular student.

**Recommendations**

To further improve the scales and stimulate their use in present and new joint vocational school systems, the author makes the following suggestions as to further studies which could be carried out:

(1) Investigate graduated students who are working and can be evaluated by employers in the actual work situation and, going into old
student records, score them and review the job prediction of such scales, or, score them and wait for several years to evaluate their employment qualities.

The Hyde-Scales will not terminate with this dissertation. The above proposed study has already been conducted by Mrs. Linda Sweazy of the Lancaster Public School system. As part of an Intern Research Project for the School of Psychology at The Ohio State University, Mrs. Sweazy in an unpublished paper of May, 1973, reported that few of the individual parts of the Hyde-Scales (e.g., days absent, I.Q., etc.) were significant; however, "those who are working in the job areas for which they were trained did have a significantly higher mean Hyde-Scale score than those who were not working in the area for which they were trained." Mrs. Sweazy accomplished this study by going back to the records of 1970, 1971 and 1972 graduates of Lancaster High School and applying these records to the Hyde-Scales for drafting, auto mechanics, stenography and cosmetology used this year. Mrs. Sweazy then used a questionnaire and phone calls to reach these students and determine if they were working in: (1) the skill area they were trained for, (2) an area related to the skilled area they were trained for, or (3) not employed in any related area. Repeating her investigation using

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analysis of variance Mrs. Sweazy found that "the Hyde-Scale as a composite by an ANOVA does appear to have predictive validity in that it is related to job status the same or related areas of training as having significantly higher mean averages on the Hyde-Scale in comparison to those not employed in the area of training."5

Also, the Pickaway-Ross Joint Vocational School has asked to investigate the scales for their student placement system and, at a state cosmetology meeting held in Columbus May 12, 1973, the author was surprised by the statement that the Cuyahoga Falls High School has used the Hyde-Scales and were extremely happy with the two year results.

(2) Revise those scales in poorly correlating taxonomies to more closely represent the higher correlating scales of other schools. Then retest for another year.

(3) Conduct a scale by scale analysis of the taxonomy and study and revise those items not correlating with the total scale and the performance variable. Then retest for another year.

(4) Compare standardized tests ranking correlation with the Hyde-Scale in the taxonomies which offer such a test of performance. E.g., the results of the Trade Achievement Test in such taxonomies as Auto Mechanics, Drafting and Cosmetology.

\[5^{\text{Ibid.}}\]
APPENDIX A

HYDE-SCALE SAMPLES AND TEACHER RECOMMENDATION SHEETS
SAMPLE SCALE CONCEPTS
# Student Selection Criteria

## Drafting

<table>
<thead>
<tr>
<th>GRADES (10)</th>
<th>10.0-10.1</th>
<th>9.0-9.1</th>
<th>8.0-8.1</th>
<th>7.0-7.1</th>
<th>6.0-6.1</th>
<th>5.0-5.1</th>
<th>4.0-4.1</th>
<th>3.0-3.1</th>
<th>2.0-2.1</th>
<th>1.0-1.1</th>
</tr>
</thead>
<tbody>
<tr>
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<td>10</td>
<td>9</td>
<td>8</td>
<td>7</td>
<td>6</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
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</table>

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<tr>
<th>ATTITUDE (20)</th>
<th>POOR</th>
<th>FAIR</th>
<th>GOOD</th>
<th>VERY GOOD</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
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</table>

<table>
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<tr>
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<th>10</th>
<th>9</th>
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<th>4</th>
<th>3</th>
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<table>
<thead>
<tr>
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<th>90-99</th>
<th>80-89</th>
<th>70-79</th>
<th>60-69</th>
<th>50-59</th>
<th>40-49</th>
<th>30-39</th>
<th>20-29</th>
<th>10-19</th>
<th>0-9</th>
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<tbody>
<tr>
<td>Points</td>
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<th>30-39</th>
<th>20-29</th>
<th>10-19</th>
<th>0-9</th>
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<td>Percentile</td>
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<th>80-89</th>
<th>70-79</th>
<th>60-69</th>
<th>50-59</th>
<th>40-49</th>
<th>30-39</th>
<th>20-29</th>
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<th>70-79</th>
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<th>30-39</th>
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<th>10-19</th>
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<tbody>
<tr>
<td>Percentile</td>
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<th>MECHANICAL REASONING (20)</th>
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<th>80-89</th>
<th>70-79</th>
<th>60-69</th>
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<th>40-49</th>
<th>30-39</th>
<th>20-29</th>
<th>10-19</th>
<th>0-9</th>
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<tbody>
<tr>
<td>Percentile</td>
<td>20</td>
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<tbody>
<tr>
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<table>
<thead>
<tr>
<th>RECOMMENDED COURSES (5)</th>
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<table>
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<tr>
<th>STUDENT'S NAME</th>
<th>60</th>
<th>70</th>
<th>80</th>
<th>90</th>
<th>100</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOTAL</td>
<td>10</td>
<td>20</td>
<td>30</td>
<td>40</td>
<td>50</td>
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</tbody>
</table>
# Drafting Student Selection

## Criteria

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Scales</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Grades</strong></td>
<td><img src="chart1" alt="" /></td>
</tr>
<tr>
<td><strong>2. Attitude</strong></td>
<td>POOR FAIR GOOD VERY GOOD POINTS</td>
</tr>
<tr>
<td><strong>3. Attendance</strong></td>
<td>DAYS ABSENT</td>
</tr>
<tr>
<td><strong>4. Mental Level</strong></td>
<td><img src="chart2" alt="" /></td>
</tr>
<tr>
<td><strong>5. Reading Comprehension</strong></td>
<td><img src="chart3" alt="" /></td>
</tr>
<tr>
<td><strong>6. Abstract Reasoning</strong></td>
<td><img src="chart4" alt="" /></td>
</tr>
<tr>
<td><strong>7. Numerical Ability</strong></td>
<td><img src="chart5" alt="" /></td>
</tr>
<tr>
<td><strong>8. Mechanical Reasoning</strong></td>
<td><img src="chart6" alt="" /></td>
</tr>
<tr>
<td><strong>9. Spatial Relationship</strong></td>
<td><img src="chart7" alt="" /></td>
</tr>
</tbody>
</table>

Add five points for each of these courses in which the student received "C" or above - Algebra, Geometry, Mech, Drawing.

## Comments: Total 12
<table>
<thead>
<tr>
<th>CRITERIA</th>
<th>SCALES</th>
<th>POINTS</th>
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<td>0 1 2 3 4 5 6 7 8 9</td>
<td>Points</td>
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Subtract 5 points for each course in which the student received below a C.

Subtract 50 points if the student doesn't have Introduction to Auto.

Deficiency (i.e. Unprice)
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<tr>
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Subtract 5 points for each of these errors in which the student received below a C.

Int. to Drafting     Above     Comment
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<th>SCALES</th>
<th>POINTS</th>
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<tr>
<td>Attendance</td>
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<tr>
<td>Mental Level</td>
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<tr>
<td>Attitude</td>
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<tr>
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</tr>
<tr>
<td>Employability</td>
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<td></td>
</tr>
<tr>
<td>Abstract</td>
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Subtract 5 points for each of these courses in which the student received below a C.

- Efficiency and/or comments:
  - Line No. 7
  - Line No. 10
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<thead>
<tr>
<th>CRITERIA</th>
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<td>Grades</td>
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</tr>
<tr>
<td>ATTENDANCE</td>
<td></td>
<td>Days Absent</td>
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<td></td>
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<td>Points</td>
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<tr>
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Rating Scale:
G = Teacher
I = Instructor
T = Teacher

Subtract 5 points if the student misses more than 6 out of 10 tests. Deficiency and/or correction.
<table>
<thead>
<tr>
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<th>POINTS</th>
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<td>COGNITIVE APPLICITY</td>
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Subtract 50 points if the student receives an F grade.

Deficiency and/or comments: Grade in italics
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<th>Scale</th>
<th>Points</th>
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Deficiency under concern:
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<th>POINTS</th>
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</thead>
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<td>ATTENDANCE</td>
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Paging Scale
6 = 2.5 Grade
I = Instructor
T = Teacher

Student Selection Criteria
Total Credits

School:

Student:______________________________________________________________
Telephone No.

Deficiency and/or Comments:

Subtract 10 points if student isn't 1 year behind his normal class.
TEACHER'S RECOMMENDATION OR EVALUATION OF STUDENT

STUDENT: __________________________________________

Simply stated, what we want in your opinion of the student reduced to a numerical equivalent. Ideally, we desire a person who applies himself diligently to his work, relates well to his classmates and teachers, and has a pleasing personality.

Attitude is one of very different areas that we are evaluating for each person; however, attitude is weighted very heavily since attitude appears to be more directly related to success in the program than the other factors.

Please circle one of the following numbers in order to indicate your evaluation of the student:

<table>
<thead>
<tr>
<th>ATTITUDE</th>
<th>POOR</th>
<th>FAIR</th>
<th>GOOD</th>
<th>VERY GOOD</th>
</tr>
</thead>
</table>

Please give the following items your careful consideration and check the percent of the time this student does exhibit that particular trait according to your observance during the time you have been acquainted with the student.

2. ABILITY TO WORK WITH OTHERS: cooperation and friendliness; can take orders as well as give them.

Percent 0 10 20 30 40 50 60 70 80 90 100

3. RESPONSIBILITY: dependable, willing to accept delegated duties; follows directions; takes initiative without being asked.

Percent 0 10 20 30 40 50 60 70 80 90 100

4. HEALTH: free from noticeable disease or uncontrolled mental or physical condition; is able to attend school regularly and perform class assignments.

Percent 0 10 20 30 40 50 60 70 80 90 100

5. NEATNESS: personal hygiene traits exhibited and care of appearance of self and surroundings.

Percent 0 10 20 30 40 50 60 70 80 90 100
Lancaster New Technical School
Teachers Recommendation

Student ____________________________ School ____________________________

Teacher ____________________________

Simply stated, what we want is your opinion of the above student reduced to a numerical equivalent. As you rate the student on the scale at the bottom of the page, will you try to consider the potential and any factors, e.g., attitudes, that you consider relevant.

Place an (X) at the point that best indicates your assessment of the student. Please note the four smaller divisions in each scale to help in rating other areas or where you are able to do so.

All instructors are to complete the following "Section I"

I. INSTRUCTOR RECOGNITION

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<th>Fair</th>
<th>Good</th>
<th>Excellent</th>
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Points

These instructors in Cosmetology, B.E., E.T.T., and T.S. rate the following.

II. EMPLOYABILITY

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<th>Easy to Place</th>
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Points

These instructors in B.E., E.T.T. rate the following.

III. CAREER OBJECTIVES

<table>
<thead>
<tr>
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<tr>
<td></td>
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<td>29</td>
<td>30</td>
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Points

Instructors in Cosmetology rate the following.

IV. COSMETOLOGY APTITUDE

| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
|---|---|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|

Score

Points

Instructors in Clerk-Stenography rate the following.

V. TYPING SKELETON ARM APTITUDE TEST

| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
|---|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|

Raw Score

Points

Additional Comments:
APPENDIX B

DATA COLLECTION SHEETS
### TAXONOMY: AUTO MECHANICS

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<th>MUSKINGUM</th>
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<th>LANCASTER</th>
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APPENDIX C

CORRESPONDENCE
February 12, 1970
North Royalton, Ohio

Mr. Hyde;

Earlier this year, in September, 1969 to be exact, I had experienced an incident with a complaining parent whose child was not accepted into the O.W.F. program. The parent in question was a woman with moderate education but well-read. She questioned the department and the school's selection methods for O.W.F. students. She even went so far as to save any and all newspaper or magazine clippings that shed a negative cast on the O.W.F. program.

After reading and evaluating her son's scores and another student's who was accepted (via the Hyde Scale) she agreed that the selection methods were fair and impartial as was practical. Most importantly, she agreed (reluctantly) that her son did NOT belong in the O.W.F. program.

The Hyde Scale did save me and the counselor considerable embarrassment and need for counter arguments.

Thank You,

Sincerely,

Emery M. Szaflarski, Coordinator
O.W.F. Program
North Royalton City Schools
North Royalton, Ohio
Letter #2

MEMORANDUM

TO: Building Principal
FROM: Lou Vida
SUBJECT: 1972-1973 Release Agreement to Schools Using the General Aptitude Test Battery

DATE: August 24, 1972

Attached to this Letter are 1972-1973 Release Agreement Forms for secondary school use of the General Aptitude Test Battery (GATB). These forms are being used for research purposes in schools with field release agreements during the fiscal year. If you are presently using the battery in your school setting project or anticipate using it during this school year, please fill out the attached forms and return them to us. Conditions under which the test may be used are described in the agreement form.

Please note that the release agreement has been revised as follows:

Item 9 indicates that the GATB is not to be used for the selection or placement of students into educational programs. That is, the GATB should not become the criterion or a part of a set of criteria designed to "include" or "exclude" a student from a particular educational course or program. This interpretation limits the intended use of the GATB as a valuable instrument to assist students in developing long-range career goals and making related curricular choices. Since the GATB was adopted by the Division of Guidance and Testing for use in Career Development Programs, any use of the GATB as a selection device would be inconsistent with this intended use.

Item 46 indicates the plans of the Division of Guidance and Testing and/or the Bureau of Employment Services to review research related to any use of the GATB especially when the purpose of the research is to generate data for use in educational placement or selection. In special cases where the GATB has been validated against success criteria for a given career, the GATB may be used as a selection instrument for that course only. It will be the responsibility of the Division of Guidance and Testing, in cooperation with the Bureau of Employment Services to ensure the validity of the data being used in the selection process.
We will be happy to answer any questions you may have regarding the release agreement or provide you with additional information regarding training programs for school personnel or the vocational guidance uses of the CATS.

Please list on this release agreement the signature of your school principal as well as the signature(s) of the person(s) in your school who are qualified to administer and interpret the CATS. A qualified person is one who has successfully completed a 20-hour training workshop sponsored by the Division of Guidance and Testing. The signed copy should be returned to NCSA. After we have received and recorded the information, a final approval copy will be returned for your records.

Best wishes for a successful and rewarding school year.

Return to:

Lea Yule
Testing Program Consultant
Ohio Testing Services
Division of Guidance and Testing
The Courtyard Building
Columbus, Ohio 43212

Lea Yule

Copy.
This is a letter in reply to your request for information about the development of criteria for our attitude scale. All the scales and all the criteria for the scales were developed only after extensive consultation with vocational teachers, counselors, and administrators.

First we arrived at a definition for attitude which was generally agreed upon. A person who has a good attitude is one who, "relates well to both classmates and teachers, applies himself diligently to his work, and has a pleasing personality."

Prior to the completion of our scales we ran a small study on our junior drafting class and attempted to show a relationship between grades earned and the vocational instructors rating of the students attitude. Several other items were compared to attitude such as, aptitude scores, I.Q., achievement scores, etc. Of the several items compared the item that most nearly correlated with a good grade in that vocational area was attitude.

Of course we realize that of all the items used to construct a meaningful chart, attitude seems to be the most subjective. However we have kept all our rating charts since the beginning and it appears, although we have never made a formal statistical study that the attitude ratings correlate more closely with academic success in all of the vocational programs than any other item of selection.

Prior to final selection of students for the various programs we ask for attitude rating from four different teachers for each student. We then average out the four different ratings to arrive at a score for the attitude scale.

Incidentally before we ever used our scales we had them approved for use by our psychologist, assistant superintendent, Trade & Industrial Supervisor and Superintendent. Since we have been using our scales there has not been one even one objection to their use by the vocational instructors who have taught the students selected for them by the application of the Hyde Scales.

In conclusion, although attitude ratings appear to be made upon a basis of subjective opinions, we feel that each teacher who rates these students possesses an intuitive faculty which enables them to rate students' attitudes and to discern those qualities in a student which indicates future success.
The human mind is a more complex and marvelous computer than a mechanical computer. It can hold and relate more intangibles about human behavior than any mechanical-electro devise. The teacher builds his or her judgment upon a day by day experience with these pupils under many different circumstances and is continually sifting facts and knowledge about the individuals.

Perhaps that which seems subjective is in reality more objective than we realize.

Sincerely,

Jim Brickels


Brum, Herbert D. "The Role of State, Local and Teacher Training Personnel in Developing Programs for the Disadvantaged and Handicapped." Paper read in Atlanta, Georgia, February 17, 1970. (Mimeographed.)


Wells, Carl E. "Will Vocational Education Survive?" Phi Delta Kappan, LIV (February, 1973).
