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ABSTRACT

Many students who enter public schools leave without achieving what has become the expected minimum level of educational attainment, a high school diploma. The purpose of this study was to contribute to existing dropout-prevention research by identifying and validating reliable decision rules for differentiating actual dropouts from high school completers. A review of the literature resulted in the identification of 43 variables being used by different program personnel to identify the potential dropouts. A tally was completed reflecting the number of times each variable occurred across the 100 dropout prevention programs reviewed. Of these programs, 13 specific procedures were found that had necessary conditions for comparison and evaluation. Once the 13 procedures were selected, a search was conducted in the High School and Beyond (HS&B) database for elements that could be used to operationally define the variables listed in each of the 13 selected dropout identification procedures. The operationally defined variables were then used to predict which students in the HS&B database would be dropouts. The results of those evaluations were then compared to known dropout figures available for the HS&B sample. The results suggest that the best procedures for predicting dropouts were the Dropout Prediction Instrument, Potential Dropout Profile, Dropout Prediction Equation, and Identifying Potential Dropouts Scale. (ABL)

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AN EVALUATION OF SELECTED PROCEDURES FOR IDENTIFYING POTENTIAL HIGH SCHOOL DROPOUTS

James M. Weber

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FOREWORD

Since the mid-80s millions of federal, state and local tax dollars have been spent on dropout prevention efforts in our public schools. Despite this substantial investment, recent Census data suggest that the dropout problem has not abated and may actually be increasing. While a myriad of programs have surfaced that are designed to help students prior to their actually quitting school, the limited funds available make it imperative that the students being served are clearly those who would drop out of school if no intervention were provided. The study described in this report will help to address this nationwide concern via the compilation and preliminary evaluation of several different dropout identification procedures. The resultant findings and recommendations should be of use to schools and school districts that are anticipating or are currently involved in implementing dropout prevention efforts for their at-risk students.

This study, which was conducted in the Applied Research and Development Division is a continuation of the National Center's drop-out prevention research. Project Director, James M. Weber, was aided by Nancy Puleo, Program Associate in securing dropout identification instruments and by Kyle Klingler, Student Programmer, in analyzing the data via variables in the High School and Beyond database. Additional critical assistance was provided by Frederick Bates who conducted a review of literature, synthesized dropout identification information, and reviewed the final report. Appreciation is also extented to Colleen Kinzelman for her competent clerical support. This project was conducted under a contract with the Office of Vocational and Adult Education, U.S. Department of Education.

Ray D. Ryan
Executive Director
National Center for Research
in Vocational Education

EXECUTIVE SUMMARY

Many students who enter our public schools leave without achieving what has become the expected minimum level of educational attainment--a high school diploma. This is neither a new nor abating concern in our society. In an effort to help address this major problem, a myriad of local, state, and federal programs and priorities have surfaced. Although the general level of federal funds for such efforts decreased during the early- and mid-eighties, a continuing, if somewhat diminished and grossly inadequate, programmatic presence has existed for well over three decades. In about 75 percent of these programs the emphasis is placed upon working with students prior to their actually quitting school with the primary goal being to help keep identified students (i.e., potential dropouts) in school until they graduate, while concurrently providing them with the learning experiences and skills needed to function effectively in our society once they do graduate.

One of the critical elements inherent in the operation, and ultimately the success, of such efforts is the identification of those youth chosen to participate in the programs being offered. Typically, the development and implementation of such programs require the expenditure of considerable time and fiscal resources. Therefore, if the benefits of those efforts are to be maximized, it is important that the students being served are clearly those who would drop out of school if no intervention were provided.

The purpose of this study was to contribute to existing dropout-prevention research by identifying and validating reliable decision rules for differentiating actual dropouts from high school completers. A review of the literature and existing exemplary dropout prevention programs resulted in the identification of 43 variables (typically in sets of three or more) being used by different program personnel to identify the potential dropouts to be included in their respective prevention programs. After summarizing the variables in tabular form, a tally was completed reflecting the number of times each variable occurred across the 100 programs reviewed.

A review of the results of the above summary revealed the commonalty across programs in the 43 variables being used for identifying potential dropouts, spread across school-related, personal, and home/family factors. At the same time, it appears that many prevention programs employ two to four (subjectively arrived at and loosely defined) variables to identify participants, and those variables are seldom linked into a systematic identification procedure. Program personnel seem to feel they "know" who potential dropouts are, and put less energy into selecting participants and more into setting up the program.

A standardized format was subsequently prepared to facilitate completion of evaluative comparisons among the procedures considered for identifying potential dropouts. Of the 100 dropout prevention programs reviewed, 13 specific procedures were found that had necessary conditions for comparison and evaluation: i.e., listing of specific identification variables; operational definitions and "cutoff points;" and a specific decision rule for aggregating information across the variables and for designating each student evaluated as either potential dropout or completer.

Once the 13 procedures were selected, a search was conducted in the High School and Beyond (HS&B) database for elements that could be used to operationally define the variables listed in each of the 13 selected dropout identification procedures. The operationally defined variables were then used to predict which students in the HS&B database would be dropouts. The results of those evaluations were then compared to the known dropout figures available for the HS&B sample, i.e., 2100 of the 27,500 students in the sample.

The evaluation of the 13 procedures yielded results suggesting that five of the procedures were the "best" overall in identifying which potential dropouts would actually drop out, given practical considerations, including the need for a standardized or fixed cutoff point, and a manageable number of variables. Choosing a procedure that best suits a given dropout prevention program, however, would depend upon which practical considerations are paramount: e.g., if a program is more concerned with identifying a subset of the predicted dropouts than in establishing a fixed cutoff point. Tables supplied in the final report provide a guide to the selection of identification procedures given various selection parameters.

AN EVALUATION OF SELECTED PROCEDURES FOR IDENTIFYING POTENTIAL HIGH SCHOOL DROPOUTS

Introduction

DATELINE (12/31/90): MILLIONS SPENT ON DROPOUT PREVENTION, BUT TO WHAT AVAIL?

Since the mid-80s millions of federal, state and local tax dollars have been spent on dropout prevention efforts in our public schools. Despite this substantial investment, recent Census data suggest that the dropout problem has not abated and may actually be increasing....

The general scenario predicted by this fictitious "news article" is quite likely to occur in the near future, if more is not done to improve--

(1) the procedures used to identify those students who actually drop out of high school prior to graduation, and

(2) the evaluations of dropout reduction programs, so they reflect such upgraded dropout identification procedures

The study described in this report is seen as a step toward helping to address these concerns via the compilation and preliminary evaluation of several different dropout identification procedures. The resultant findings and recommendations should be of use to schools and school districts that are anticipating or are currently involved in implementing dropout prevention efforts for their at-risk students.

Background

Many students who enter our public schools leave without achieving what has become the expected minimum level of educational attainment--a high school diploma. This is neither a new nor

abating concern in our society. For example, 2 years after the opening of the first publicly supported high school in 1821, 76 of the entering class of 176 had dropped out (Stevens and VanTil 1972). At the turn of the century only 11 percent of all high school-aged youth were actually in school (Thornburg 1974) and about 90 percent of the male students failed to receive high school diplomas (Bachman, Green, and Wirtanen 1971). By 1909 only 13 of every 100 children who enrolled in the first grade were still in school when they reached age 16 (Schneider 1981). It was not until the 1950s that the proportion of students who left high school prior to graduation declined to below 50 percent.

It is estimated that, at the national level, slightly less than 30 percent of the students entering high school leave before receiving a diploma (Sewell, Palmo, and Manni 1981; McDill, Natriello, and Pallas 1985; U.S. News and World Report 1985). This estimate of early school leavers has remained relatively constant since the 1970s and translates into approximately 800,000-1,000,000 students dropping out of school annually (Grant 1973; Buxton 1984; U.S. Department of Education 1985).

Recent data suggest that the problem is becoming especially acute in large, urban centers where dropout rates of up to 60 percent have been reported (Calitri 1983; Hammack 1986). Furthermore, a number of researchers contend that the overall, national dropout rate may increase in the foreseeable future (e.g., Anderson and Brouillette 1985; Association for Supervision and Curriculum Development 1985; Kaplan 1985; Levin 1985) due in part

to the current emphasis on increased academic requirements (McDill, Natriello, and Pallas 1985) as well as to the changing demographics of the nation's school-age population (Hodgkinson 1985).

In an effort to help address this major problem, which threatens the very fabric upon which our society is based, a myriad of local, state, and federal programs and priorities have surfaced. Although the general level of federal funds for such efforts decreased during the early- and mid-eighties (Berlin 1983; Nightingale 1985; Sticht, Armstrong, Hickey, and Caylor 1987), a continuing, if somewhat diminished and grossly inadequate programmatic presence, has existed for well over three decades. In about 75 percent of these programs (GAO 1987) the emphasis is placed upon working with and helping students prior to their actually quitting school (i.e., dropping out), with the primary goal being to help keep identified students (i.e., potential dropouts) in school until they graduate, while concurrently providing them with the learning experiences and skills needed to function effectively in our society once they do graduate.

One of the critical elements inherent in the operation, and ultimately the success of such efforts is the identification of those youth chosen to participate in the programs being offered. Typically, the development and implementation of such programs require the expenditure of considerable time and fiscal resources when calculated on a per-pupil basis. Therefore, if the benefits of those efforts are to be maximized, it is important that the

associated resources be expended on students who would become actual dropouts if no interventions were to occur.

Frequently, when school districts set up dropout-prevention programs, either they employ decision rules for identifying potential dropouts that are based upon school characteristics rather than individual student characteristics (e.g., Quinones 1985) or they apply overly simplistic student-based decision rules (i.e., rules defined by too few student behavioral and background characteristics or variables). The application of such rules generally results in relatively large errors in identifying actual dropouts. Hence, available program funds are often spent largely on "completers with a high propensity toward dropping out" (Weber 1986), who typically make up the majority of the students identified when inadequate identification rules are used. For example, in a recent report by Weber (1987) it was estimated that about 8 percent of a nationally representative sample[1] of 27,500 students were actual dropouts, but that using a statistically defined ("best") prediction rule of 36 background and performance variables, over 21 percent of the sample would be classified as potential dropouts.

Obviously, to be effective, the funds allocated for dropout prevention must be spent on those students for whom they are

[1]These estimates are based upon the High School and Beyond (HS&B) database and are subject to the limitations inherent in that sample (e.g., it does not include students who drop out prior to the middle of 10th grade and after the middle of 12th grade). Hence, the estimates for both actual dropouts and potential dropouts are likely to be underestimates.

targeted. Such funds are too limited to be effective if used as compensatory program funds. In addition, organizations and agencies that are allocating scarce resources for dropout prevention efforts--which include vocational education programs (Ohio Department of Education 1987) as well as programs that include vocational education/work experience coupled with other substantive components (Hamilton 1986; Lotto 1983; Weber 1986)--need to have greater confidence that their funds are being spent on those students for whom they are intended. Therefore, greater emphasis needs to be placed on the development and utilization of multidimensional, student-centered identification rules that are reliable dropout indicators. The need for such rules is particularly important given the current dropout prevention initiatives being undertaken by the U.S. Departments of Education, Labor, and Health and Human Services.

Several Basic Concerns Related to the Dropout Problem and Its Resolution

Problem of definition. Despite the fact that hundreds of studies have been conducted that deal with the dropout issue and that most of the approximately 16,000 school districts across the country monitor in some way the enrollment, graduation rates, and noncompletion rates of their students, relatively little agreement exists on a common definition of a "dropout" (Council of Chief State School Officers 1986). For example, the term dropout has been used to denote a variety of early school leavers (Elliott et al. 1966; Buxton 1984; Morrow 1986):

- Pushouts--undesirable students (e.g., those removed by suspension from school)
- Disaffiliated--students who no longer wish to be associated with schools
- Educational mortalities--students who fail to complete a program or specified course of study
- Capable dropouts--students whose family socialization did not agree with school demands (e.g., teenage parenting)
- Stopouts--students who leave, then return to school, usually within the same school year

Bachman, Green, and Wirtanen (1971) noted over a decade and a half ago that in the literature "very often dropout simply refers to all those who do not have a high school diploma (assuming they are part of a sample or cohort that is old enough to have completed high school)" (p. 5). Although this definition proved to be fairly workable, it fails to account for the individual who leaves school at some point in time but gets his or her diploma or a general equivalency diploma (GED) at a later point in time via an alternate route (e.g., by attending night school or taking a standard examination). For example, the Census Bureau (General Accounting Office 1986) defines dropouts as people who are not enrolled in school and are not high school graduates, or the equivalent. Under such a definition, being a dropout is a state or condition but is not an irreversible attribute. For example, a person may be a dropout, but cease to be a dropout at a later time by returning to school or completing a GED program.

Frequently the definition of dropout used is dependent upon critical, if not somewhat unique, attributes of the sample or

cohort that is being studied. For example, in the study by Bachman et al. (1971), dropouts were defined as "those individuals who interrupt their full-time attendance in high school for more than a few weeks" (p. 5). This definition was close to the standard definition of dropouts developed as part of a National Education Association (1965) project on school dropouts and used by the U.S. Department of Education. It served as a usable definition given the limited time the sample that was studied had been out of high school. In a later, related study involving the same sample, where the available data extended 5 years beyond the point of normal graduation, Bachman et al. (1978) redefined dropouts as "those who interrupted high school rather permanently, i.e., those who still lacked a diploma five or more years after they dropped out" (p. 207).

Based upon a review of the working definitions employed by different school districts as well as more formal definitions such as those noted above, Morrow (1986) identified three criteria or elements that should be addressed in the definition of a dropout:

(1) Is the student actively enrolled?

(2) If not, has the enrollment been formally transferred to another legitimate institution?

(3) Has the student earned a high school diploma or its equivalent? (p. 344)

Given these criteria, Morrow offers the following definition for a dropout:

> A dropout is any student, previously enrolled in school, who is no longer actively enrolled as indicated by fifteen days of consecutive unexcused absence, who has not satisfied local standards for graduation, and for

> whom no formal request has been received signifying enrollment in another state-licensed educational institution. (p. 353)

The definition offered by Morrow was the one adopted in the current report as well as during the analysis of the 27,500 member sophomore cohort of the High School and Beyond (HS&B) database. More specifically, in relation to that database a dropout is defined as a person who was a high school sophomore in spring 1980 but who was neither enrolled in high school nor a high school graduate or the equivalent in spring 1982. A review of that definition shows that it addresses each of Morrow's three criteria.

Procedural variations. The complexities related to the dropout problem do not stop with the specification of a definition. If there are as many definitions for dropouts as there are school districts that record data on such students, as pointed out by Freeland (1986), then there is an equally divergent set of procedures used to secure those data. Consistency of reporting dropout data is problematic both within and across school districts and states (Council of Chief State School Officers 1986). Hammack (1986) has noted:

> Some districts include special education students in their reports while others do not; some include all students enrolled in any type of program offered by the district, while others include only those enrolled in regular day high schools. The specific dropout codes used vary, so that in some districts, a transfer to a business or trade school is not registered as a dropout, while in others it is, at least if the school does not offer a high school diploma program. Finally, as the structure of educational systems varies both within districts and between them, there is no consistency in the grade levels included. . . . . The data reported in

> dropout reports sometimes includes only tenth through twelfth grades; others report ninth through twelfth grades, but only those from regular four-year high schools, leaving unreported ninth-grade students dropping out from junior high schools. (pp. 327-328)

School districts (as well as researchers) also vary in the way in which they calculate dropout rates (Urban School Districts' Task Force on Dropouts 1985; Hammack 1986; Morrow 1986). In most cases, three factors influence those calculations:

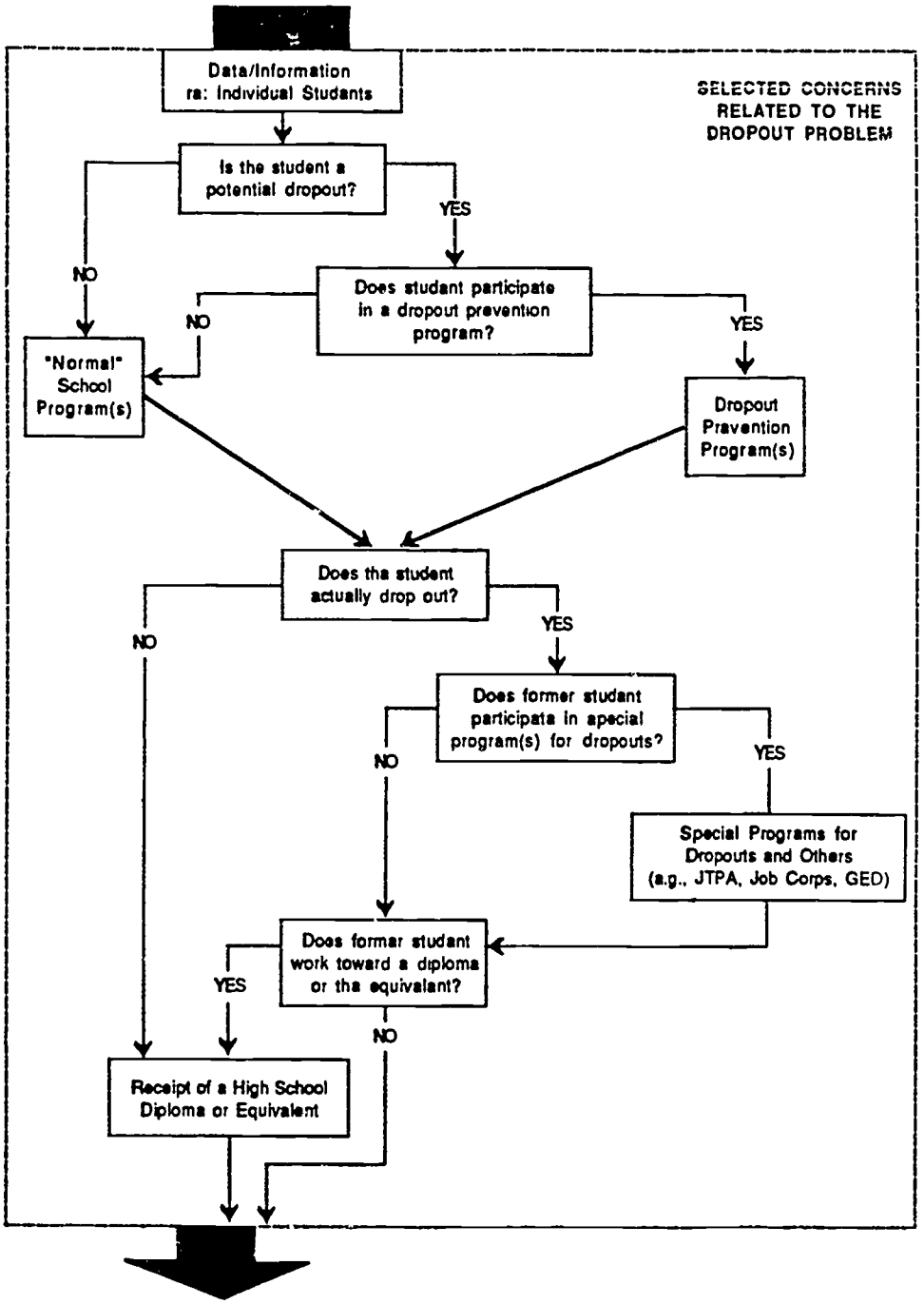
- the time frame during which the number of students who drop out is counted (e.g., a calendar year, a 9-month period, or 4 years)
- the range of grade levels from which the pool of dropouts is drawn (e.g., K-12, 9-12, 10-12)
- the student accounting procedure used by the district (e.g., average daily attendance or average daily membership), which serves to define the baseline population or pool from which dropping out is said to occur

If greater standardization of dropout rates is to occur, Morrow (1986) contends that greater consistency needs to be achieved in each of the following procedural areas: the definition of a dropout, the specification of a time frame during which the number of dropouts is counted, and the specification of the baseline population or pool of students from which dropping out is said to occur.

The Urban School Districts' Task Force on Dropouts (1985) and Morrow (1986) recommend that an annual dropout rate be calculated each year (e.g., the total number of students in grades K-12 qualifying for dropout status within a calendar year, divided by the average daily attendance for all secondary school students in grades 7-12). Morrow recommends that a cohort dropout rate be

calculated as well (i.e., the total number of students qualifying for the status of dropout, who, at the time of dropping out, were members of a cohort of students in grades 7 through 12, divided by the absolute number of students assigned to the cohort minus those who died or were formally transferred to another state-licensed educational institution). Although the Urban School Districts' Task Force on Dropouts expressed agreement as to the value of such an estimate, they felt the costs associated with its generation did not warrant its being calculated routinely; for example, on an annual basis.

Critical decision events. The concerns with definition and data collection focus largely on recording/documenting the numbers of students who actually drop out or do not complete high school (or its equivalent). However, as alluded to earlier, if we are to progress beyond the recording and documenting stages, procedures and related prediction rules for identifying those students who are most likely to quit school before graduating (i.e., potential dropouts) need to be established and validated. The establishment of reliable rules for predicting such students, who will be the students targeted to receive services, represents a critical first step in efforts to programmatically address the dropout problem. As shown in figure 1, the identification of potential dropouts represents the first decision event among those inherent in efforts to track and assist such students in addressing their educational needs. In addition, reliable prediction rules are needed to determine (1) which students will actually leave school



SOURCE: Weber 1987, p. 5.

Figure 1. A chronology of key decision events related to the secondary school dropout problem.

and can be differentiated from among the pool of potential dropouts, (2) which actual and potential dropouts are likely to participate in special programs designed to help address their needs, and (3) which actual dropouts are likely to go on to complete high school via a diploma or GED. Also, specific parameters that define effective programs for potential and actual dropouts need to be identified, integrated, and used as the basis for addressing the needs of such youth.

Concerns Surrounding the Early Identification of Potential Dropouts

Although educators, researchers, and policymakers have not agreed on a standard operational definition for dropouts (e.g., see Hammack 1986; Morrow 1986; Mann 1985; Freeland 1986; Urban School Districts' Task Force on Dropouts 1985), most will agree on what the general profile for such students looks like. Syntheses of the literature (Bachman, et al. 1971; Rumberger 1981; Mertens, Seitz, and Cox 1982; Weber and Silvani-Lacey 1983; Wehlage and Rutter 1984; Los Angeles Unified School District Dropout Prevention/Recovery Committee 1985; Ekstrom et al. 1986) suggest that dropouts can often be identified by the following:

- Cognitive characteristics--demonstrate poor basic skills (e.g., reading and computation skills) as shown in test scores well below average for their expected grade levels; repeated grade levels; poor academic performance; and low scores on intelligence tests (mean IQ of 90)

- Affective characteristics--appear to lack interest in school and school work; feel alienated from the school environment, teachers, and peers; perceive little interest, respect, or acceptance on the part of teachers; have low self-concepts and exhibit characteristics of social immaturity; tend to be either hostile and unruly or passive and apathetic

- Other characteristics--are older than their classmates; are frequently absent and tardy; are from low-socioeconomic backgrounds in which one or both parents did not complete high school; are from weak or broken homes; are often members of minority groups and/or handicapped; receive little family encouragement and psychological support to stay in school; have had at least one child and/or are married

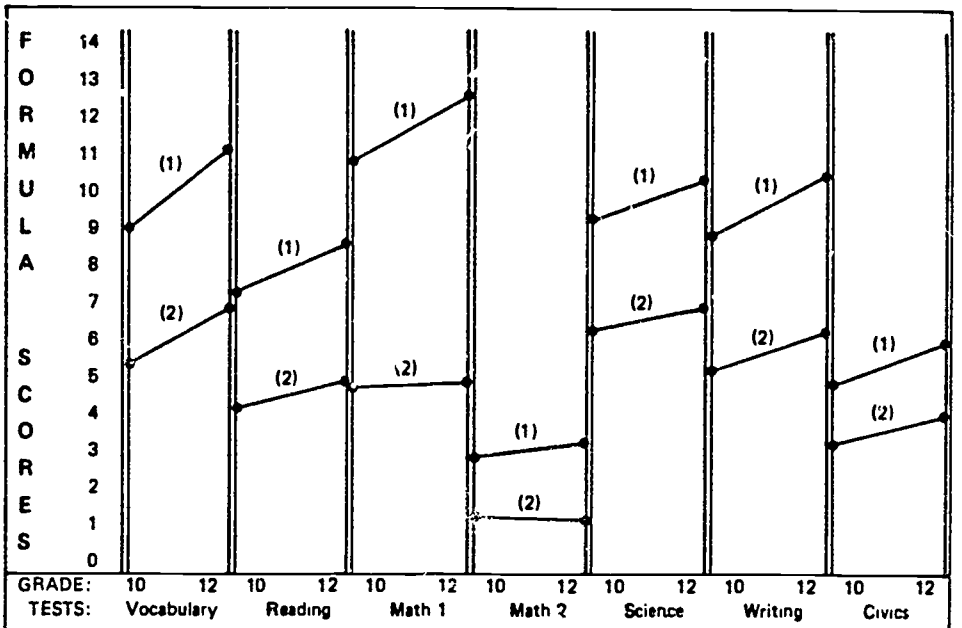
Although not all students who exhibit these characteristics actually drop out, most dropouts do exhibit some combination of such features.

Relationships can be drawn between the various performance and background characteristics listed above and the dropout problem in high school. See tables 1 and 2. These relationships reinforce and augment the factors frequently stated by dropouts as their reasons for leaving school (Peng and Takai 1983; Applebaum and Dent 1983; Kumer and Bergstrand 1979; Bachman et al. 1971).

Although the kinds of relationships shown in tables 1 and 2 are quite informative, research suggests that the act of dropping out, which is generally an individual decision, is rarely the result of a single factor. Rather, it tends to be the result of the interaction among a number of factors that culminates in the decision to leave school. Furthermore, for most youth the decision to drop out of school does not "just happen." By the time such a student enters high school, many predictive signs are already present. For example, if a youth comes from a single-parent family or has a history of poor work and failure in school, then that person has a greater than average chance of becoming a dropout (Bachman et al. 1971).

TABLE 1

RELATIONSHIP OF DROPPING OUT
TO STUDENTS' BASIC SKILLS PERFORMANCE



GROUPS: (1)=Completers (2)=Dropouts

TEST MEANS

Groups*	Grade Level	Vocab.	Read.	Math 1	Math 2	Scienc	Writing	Civics
(1) Completers (n=18,993)	10	9.0	7.2	10.8	2.7	9.1	8.8	4.7
	12	11.3	8.5	12.4	3.1	10.1	10.5	5.8
(2) Dropouts (n=1,360)	10	5.4	4.2	4.7	1.2	6.3	5.1	3.3
	12	6.8	4.9	4.9	1.2	6.8	6.1	4.0

Note: *These groups are comprised of students from HS&B who had complete sets of scores on the designated tests.

MANOVA SUMMARY

Hypothesis	Wilks Lamda	Hyp. df	Error df.	Approx. F-value
Interaction—Were the changes in tests scores between 80 and 82 equal for both groups?	.99	7	20345	26.2*
Groups—Were the test scores of the two groups (summed across times) equal?	.94	7	20345	173.8*
Time—Were the changes in test scores across times (summed across groups) equal to 0?	.81	7	20345	1,867.2*

Note: *Significant at α = .001 level

SOURCE: Weber, 1987, p. 11.

TABLE 2

RELATIONSHIPS OF SELECTED BACKGROUND CHARACTERISTICS TO DROPPING OUT

Background Characteristics (and Potential Ranges)	Groups		Related Statistics
Have a limiting physical condition or handicap (1=yes, 0=no)	(1) Dropouts - actual		11%
	(2) Completers - high dropout potential		13%
	(3) Completers - low dropout potential		6%
Family socioeconomic status (Overall mean=0)	(1) Dropouts - actual		x = -.4 F = 533 0422
	(2) Completers - high dropout potential		x = -.4 (1=2<3)
	(3) Completers - low dropout potential		x = 1.0
	(4) High SES		5.2% drop out
	(5) Middle SES		9.0% drop out
	(6) Low SES		17.4% drop out
	(7) Unknown		31.6% drop out
Fathers' education less than high school (1=yes, 0=no)	(1) Dropouts		33%
	(2) Completers		22%
Mothers' education less than high school (1=yes, 0=no)	(1) Dropouts		35%
	(2) Completers		19%
Community type	(1) Urban*		19% drop out
	(2) Suburban		12% drop out
	(3) Rural		13% drop out
Race/Ethnicity**	(1) White		15% drop out
	(2) Black		21% drop out
	(3) Hispanic		39% drop out
Limited English proficiency (1=yes, 0=no)	(1) Dropouts		21%
	(2) Completers		8%
Has had first child***	(1) Dropouts	(a) by 10th grade	3 0%
		(b) between 10th and 12th grades	19.0%
	(2) Completers	(a) by 10th grade	.5%
		(b)between 10th and 12th grades	1.4%
Married	(1) Dropouts	(a) by 10th grade	.8%
		(b) between 10th and 12th grades	18 8%
	(2) Completers	(a) by 10th grade	.3%
		(b) between 10th and 12th grades	1.1%

NOTES Except where indicated the information presented is based upon the sophomore cohort of the High School and Beyond database (a nationally representative sample of approximately 27,000 students)

The observed F-Value is significant at α .0001 level.

* Recent reports set the rate for Miami = 29 5%, New York = 38 4%, and Chicago = 43%.

** Based upon data reported by Boyer (1983)

*** The growing problem of teen pregnancies was recently summarized by Wallis (1985).

SOURCE: Weber 1987, p. 8.

The complexity of the problem surrounding the reliable identification or prediction of actual dropouts from among a representative sample of secondary school students was briefly described by Curtis (1983) and more recently by Weber (1986). In the latter of those studies, which involved an analysis of the sophomore cohort of the High School and Beyond (HS&B) database--a longitudinal, nationally representative sample of approximately 27,500 who were sophomores in 1980 and seniors (or dropouts) in 1982--the "best" prediction rule obtained using a statistical technique known as linear discriminant analysis, involved 36 different "predictor" variables. (See appendix A.) The application of that rule to the HS&B sample yielded the results shown in figure 2.

		PREDICTED CLASSIFICATIONS		
		Predicted Completers	Predicted Dropouts	n's per Group
ACTUAL CLASSIFICATIONS	Actual Completers	20,353	3,374	23,727
	Actual Dropouts	838	1,310 (.28)	2,148
	n's per Predicted Groups	21,191	4,684	25,875

Figure 2. Classification results obtained via the "best" (36 variable) prediction rule identified.

The frequencies summarized in figure 2 show a number of things about predicting dropouts (i.e., identifying students who are likely to drop out--potential dropouts), including:

- overall, if one were to use the indicated rule, they could correctly classify 84 percent of the total sample of students;
- the application of the indicated rule would result in the correct classification of 86 percent of the completers and 61 percent of the dropouts; and
- of those students who would be predicted to be dropouts by the indicted decision rule (i.e., those students who would be classified as potential dropouts and normally considered for participation in special dropout prevention programs), 72 percent would be completers and 28 percent would be actual dropouts.

The last of these results suggests that if one were to use the "best" statistical decision rule possible for the HS&B samples, they would only do a 20 percent better job of identifying actual dropouts than they would if they randomly sampled students from the target group.

Ideally, when using a decision rule like the one noted, one would want to identify a sample of predicted dropouts that consisted only of actual dropouts, i.e., contained relatively few, if any, completers. Even if the rule in question did not classify that many students as dropouts (e.g., 0 percent of those predicted to be dropouts were actual completers, while only 25 percent of the actual dropouts were predicted to be dropouts), the resulting rule would be "better" than that used to obtain the results shown in figure 2. The rationale for such a conclusion rests on the assumption that most dropout prevention programs involve limited

funds and cannot serve all the students who need help. At the same time, one wants to be as certain as possible that the students being served via those limited funds are clearly the students who would drop out of school if no intervention was provided.

The results that would be observed if several prediction rules other than the one used to generate the results shown in figure 2 were used are summarized in figure 3. A review of those results indicates that in each case the group of predicted dropouts contains too many actual completers. For the four decision rules noted the results are only 5 percent, 5 percent, 3 percent, and 4 percent, respectively, better than would have been obtained if a random sample had been drawn from the target group.

The preceding empirical findings help to document the complex nature of the decision to "drop out" of school and the care that needs to be taken when identifying "potential dropouts" who will receive special programming assistance. If the decision rules employed are too simplistic (i.e., defined by too few variables), the resulting overall classification rates may become unacceptably low or at a "chance" level. As a result, when such decision rules are utilized, too many completers may be classified as dropouts. Consequently, if limited resources are available for addressing the dropout problem those resources will be dispersed over a larger group, which contains a disproportionately large number of actual completers.

PREDICTION RULE USED	CLASSIFICATION RESULTS		
• Family SES and School/Contextual Variables		PREDICTED CLASSIFICATIONS:	
		Completers	Dropouts	n's per Group
	Actual Completers	13,807	9,920	23,727
	Actual Dropouts	680	1,468 (.13)	2,148
	n's-Predicted Groups	14,487	11,388	25,875
• Achievement Test Scores and School/ Contextual Variables		PREDICTED CLASSIFICATIONS:		
		Completers	Dropouts	n's per Group
	Actual Completers	13,250	10,477	23,727
	Actual Dropouts	599	1,549 (.13)	2,148
	n's-Predicted Groups	13,849	12,026	25,875
• Ethnicity (Black vs. Other) and School/ Contextual Variables		PREDICTED CLASSIFICATIONS:		
		Completers	Dropouts	n's per Group
	Actual Completers	13,975	9,752	23,727
	Actual Dropouts	905	1,243 (.11)	2,148
	n's-Predicted Groups	14,880	10,995	25,875
• Participation in Remedial Math and School/Contextual Variables		PREDICTED CLASSIFICATIONS:		
		Completers	Dropouts	n's per Group
	Actual Completers	13,357	10,370	23,727
	Actual Dropouts	720	1,428 (.11)	2,148
	n's-Predicted Groups	14,077	11,798	25,875

Figure 3. Classification results obtained via prediction rules based on variables suggested in previous research studies.

Variables Commonly Used in Dropout Identification

Despite the primacy of the need to identify potential dropouts in efforts to track and assist them in addressing their educational problems (as indicated earlier in figure 1), no standardization of variables or procedures for engaging in such an identification process has occurred. For that matter, it is not atypical during discussions with personnel responsible for "exemplary" dropout prevention programs or in written descriptions of such programs to find statements like the following:

- "It (a special Support Center) targets students from the sixth grade on when the usual avenues have been tried and the students continue to have difficulties." (Appalachian Regional Commission 1987, p. 9)
- "The . . . program is designed to motivate low-income rural youth, . . . to remain in school and complete their high school education." (Appalachian Regional Commission 1987, p. 14)
- "The program targets students who have a record of poor attendance, poor academic performance, and discipline problems." (Campbell Communications, Inc. 1987, p. 10)
- "Students from economically disadvantaged familiar, slow learners, students of single parents and members of special education classes were selected for participation in the project." (Appalachian Regional Commission 1987, p. 9)

Such statements serve to illustrate the variant nature of the variables being used to identify participants in different types of dropout prevention programs as well as the variant levels of specificity, replicability, and objectivity that characterize those variables.

The preceding statements also suggest that dropout prevention programs generally appear to employ a myriad of different variables for identifying their respective program participants. At first glance, it would seem that the variables used for identification purposes are different (in nature or in the ways in which they are operationalized) for different programs and much more diverse than those programs. In an effort to evaluate this assumption, a review of numerous dropout prevention programs was completed. The basic question addressed as part of that effort was, "What variables, if any, are used most frequently by the personnel responsible for different dropout prevention programs to identify the participants for their programs?"

Results of the Program Review

The review that was conducted focused upon descriptive materials from a national sample of current, dropout prevention programs (nominated by their respective state departments of education as "exemplary") as well as materials from a number of reports describing different dropout prevention efforts. The materials reviewed dealt with programs that are either currently in operation or have been in operation since 1980. (A listing of the various sources for the programs and studies considered is presented in Appendix B.)

Based upon the reviews that were undertaken, 43 variables were identified (typically in sets of three or more) as being used by different program personnel to identify the students (i.e.,

potential dropouts) to be included in their respective prevention programs. (During the course of the reviews some liberties were taken in regard to combining variables considered to be quite similar, if not equivalent--e.g., low-income was treated as synonymous with economically disadvantaged--while other variables, though similar, were treated as distinct--e.g., academic achievement vs. reading level/skill or math skill level. In the latter instances the specificity of the variables identified and the ability to "measure" those variables were major considerations.) A listing of the 43 variables noted, arrayed in terms of three descriptive factors or categories that emerged during the review process, is presented in exhibit 1.

Following this initial compilation, the identified variables and related, descriptive information were summarized in tabular form--see table 3. Included in that summary are brief descriptions of the operational definitions, where available (i.e., provided in the respective source documents), for the variables listed and an indication of the number of times each variable was noted across the approximately 100 different dropout prevention programs considered.

The results of the different program reviews generally suggest that there is a degree of commonality in the variables used by different dropout prevention programs to identify the students who will be included in their respective programs. Furthermore those variables are spread across the School-Related, Personal, and Home/Family factors that evolved during the review

EXHIBIT 1

INITIAL CHECKLIST/CHART OF DROPOUT PREVENTION VARIABLES

SCHOOL-RELATED

ATTENDANCE/ABSENTEEISM (1)

Data-Measurable

ACADEMIC PERFORMANCE (2)

Data-Measurable
- Retention/Age (3)
- School Grades (4)
- Reading Ability (9)
  - -Bilingual
  - -Learning Disability (34)
- Normative Test Data (11&28 combined)
- Math Ability (14)
- Exceptional Child (23) (Special Educ. Identified)
  - -Learning Disability (34)
  - -Physical Handicap (35)
  - -Gifted (42)
  - -Emotional Handicap
  - -Mild Mental Handicap

Difficult to Measure
- Interest in School Work (8)
- General Adjustment (30)
- Learning Style (36)
- Difficulty in Traditional Setting (39)

DEMOGRAPHICS (38)

Data-Measurable
- Urban
- Rural
- Mixed
- Neighborhood

PERSONAL

AGE (3)

Data-Measurable

DISCIPLINE (7)

Data-Measurable
- School-Related Actions (16)
  - -Inappropriate or Disruptive Behavior
  - -Detentions
  - -Syspensions
  - -Expulsions
- Arrests (Community-Related) (20)

Difficult to Measure
- Substance Abuse
- Reaction to School Control (16)

SOCIALIZATION (17)

Data-Measurable
- School Activities Participation (18)
- Suicide Attempt(s) (32)

Difficult to Measure
- Self-Esteem (Self-Image/Concept) (17)
- Acceptance by Peers (21)
- Out of School Activities Participation (31)
- Preponderance of Out of School Friends (40)
  - -Peer Influence (friends who dropped out)
- Self-Reported Success in School
- Perceived Relevance of School
- Parental Monitoring of Whereabouts

WORK (22)

Data-Measurable
- School Associated Work
  - -Co-Op
  - -DE
- Non-School Related Work

HEALTH (25)

Data-Measurable
- Reported Health Conditions

Difficult to Measure
- Fatigues Easily
- Emotional Instability
  - -Suicide Attempt(s) (32)

PHYSICAL SIZE (33)

Data-Measurable

SEX (37)

Data-Measurable

HOME & FAMILY

ECONOMICALLY DISADVANTAGED (5)

Data-Measurable
- Eligibilities
  - -Free Books
  - -Free Lunch
  - -Reduced Lunch
  - -Food Stamps
  - -Aid to Dependent Children
- Government Poverty Guidelines
- J.T.P.A.

EXTENUATING CIRCUMSTANCES (6)

Data-Measurable
- Pregnancy
- Teen Parent
- Teen Marriage
- Foster Child

HOME STABILITY (10)

Data-Measurable
- Both Parents at Home
- Single Parent
- No Parent
- Occupation(s) (26)
  - -Father's
  - -Mother's
  - -Latchkey Student (41)
- School to School Transfer (27)

FAMILY PREDISPOSITION TO EDUC. & GRAD.

Data-Measurable
- Educational Level of Family (12)
  - -Father's
  - -Mother's
  - -Sibling(s)
    - -# Males
    - -# Females

Difficult to Measure
- Family Attitudes Toward Education (19)
  - -Father's
  - -Mother's
  - -Sibling(s)

RACE/ETHNICITY (24)

Data-Measurable

White	Native American
Black	Asian
Hispanic	Other

TABLE 3

SUMMARY OF VARIABLES BEING USED TO IDENTIFY POTENTIAL DROPOUTS

VARIABLES	DEFINITIONS	NUMBER OF TIMES NOTED (%)
SCHOOL-RELATED FACTOR		
• Attendance	-Chronic absenteeism (20 or more days per year); 10 or more days per year (9)	50 (51%)
• School grades - GPA	-Predominantly below a "C"; Less than 2.0 (9); Less than 1.5 (1).	37 (38%)
• Academic Achievement	-Below Average; Below grade level; One or more years behind in basic skills areas	33 (34%)
• Reading level/skill	-Two or more years below grade level (1); Limited English (1)	21 (21%)
• Interest in school and school work	-Little or no interest; Bored and/or dislikes school (4)	20 (20%)
• General (Ach. or Apt.) Test Scores	-25th %ile or below tested abilities	17 (17%)
• Prior dropout	-Did not meet H.S. requirements; Chose to quit regular school	13 (13%)
• Reaction to school control	-Resents and resists control	11 (11%)
• Math skill level	-Two or more years below grade level	11 (11%)
• Participation, in-school activities	-Little or no participation	9 (9%)
• Exceptional child program handicapped (2)	-Educationally or mentally	6 (6%)
• General adjustment to school	-Fair or poor; Poor (1)	4 (4%)
• Participation, out-of-school activities	-Little or no participation	4 (4%)

continued

TABLE 3-(Continued)

VARIABLES	DEFINITIONS	NUMBER OF TIMES NOTED (%)
• Location (Urban, Suburban Rural)	-	1 (1%)
• Difficulty in traditional settings	-	1 (1%)
• Teacher rating	-	1 (1%)
PERSONAL FACTOR		
• Age relative to classmates - over age	-1 or more (8); 2 or more (4) 3 or more (1)	35 (36%)
• Discipline problems	-Disruptive behavior; # detentions; # expulsions (3); # suspensions (5)	27 (28%)
• Extenuating circumstances	-Pregnancy (14); Teen parent (6)	26 (27%)
• Social problems	-Low self-esteem (10); Social problems (6)	15 (15%)
• Acceptance by peers or classmates	-Not liked by fellow students; Racial problems (1); Loner	10 (10%)
• Substance abuse	-Drugs or alcohol problems	9 (9%)
• Criminal behavior	-arrests; Contacts with the law	8 (8%)
• Work (Not coop or D.E.)	-to aid family support	8 (8%)
• Learning Rate ("IQ")	-Below 90 IQ or 30th percentile	7 (7%)
• Health	-Often ill, fatigues easily; # health-related absences	5 (5%)
• Physical SIZE	-Small or large for class group	3 (3%)
• Suicide prone/attempted	-	3 (3%)
• Learning disability	-	2 (2%)
• Physical handicap	-	2 (2%)
• Gender	-	2 (2%)

continued

TABLE 3-(Continued)

VARIABLES	DEFINITIONS	NUMBER OF TIMES NOTED (%)
• Learning style	-	1 (1%)
• Out-of-school friends	-	1 (1%)
• Latchkey student	-	1 (1%)
• Home ownership	-	1 (1%)
• Automobiles	-	1 (1%)
• Gifted (bored)	-	1 (1%)
• Educational aspirations	-	1 (1%)
HOME/FAMILY FACTOR		
• Economically disadvantaged	-Federal poverty guidelines; ATDC; Food stamp eligible; Free lunch or book eligible	31 (32%)
• Broken home/single parent family	-Absence of father, mother, or both from family; Abuse; Family violence	19 (19%)
• Parents' Education Level	-Grade 7 or below; A parent dropped out	18 (18%)
• Race or ethnicity	-	12 (12%)
• Parents attitude toward graduation	-Negative or vacillating; Family problems (2)	8 (8%)
• Father's Occupation	-Unskilled or semi-skilled	7 (7%)
• Number of Children in Family	-Five or more	6 (6%)
• School-to-school transfers - mobility	-Pattern of jumping from school to school	5 (5%)

process. The ten variables noted most frequently (i.e., in at least 20 percent of the programs reviewed) were as follows:

- School-Related Variables
  - Attendance
  - School grades as reflected via grade point-average (GPA)
  - Academic achievement
  - Reading level/skill
  - Interest in school and school work

- Personal Variables
  - Age relative to classmates (over age)
  - Discipline problems
  - Extenuating circumstances (e.g., pregnancy or teen parent)

- Home/Family Variables
  - Economically disadvantaged
  - Broken home/single parent family

Additional Findings from the Program Review

While revealing the commonality in the variables being used for identification purposes among different prevention programs described above, the review results also indicated the following:

- although many of the same variables are used across programs, the ways in which those variables are operationally defined differ considerably, e.g., academic achievement may be defined by reviewing the grades in students' permanent files and computing the associated GPAs, from a teacher's ratings, or from a counselor's or program staff's ratings.

- the degree of subjectivity inherent in defining the variables considered is typically quite substantial, e.g., across programs achievement is more likely to be defined by teachers' or counselors' ratings than by GPAs calculated via the grades in students' permanent records.

- specific cut-off points on the variables used are typically not specified, e.g., one is more likely to see "poor academic achievement" being noted than "a GPA of 1.75 or less across their last four years of schooling."

- the variables used are typically identified on the basis of "expert" opinion or limited literature reviews.

- typically little effort in made to link the variables used together or to formulate a systematic procedure incorporating those variables--the notable exceptions occur in a few programs in medium-sized and larger cities where specific prediction rules have been generated and in cases where specific procedures recommended in the literature are employed, though those are definitely the exception rather than the rule.

- little, if any, effort is made to assess the validity or reliability (i.e., "goodness") of the variables used; e.g., even in the case of those programs that employ existing procedures (i.e., sets of variables) no effort is made to assess the relative "goodness" of those variables/procedures in the context in which the program operates.

Generally, it appears that many prevention programs employ two to four (subjectively arrived at and loosely defined) variables to identify their respective participants and that those variables are typically not linked together into a systematic identification procedure. One is struck by the pervasiveness of the apparent assumption made by program personnel that they "know" who the students in need are in their schools or districts and that it is much more important to devote the totality of their energies and resources to setting up programs that help those students rather than "wasting" their time or resources verifying something they already "know."

Several Procedures Used to Identify Potential Dropouts

As pointed out in the preceding section, the program review that was undertaken revealed that dropout prevention programs, including those deemed to be "exemplary," typically employ several subjectively-defined variables to aid them in identifying their

respective program participants, but that few of them integrate the variables they utilize into an explicit, objective identification procedure that can be replicated and evaluated over different times and settings. For that matter, during the indicated program review only 16 dropout identification procedures[2] were identified. In the materials that follow descriptions of those different procedures are provided, along with preliminary assessments of the relative "goodness" of the results that would be predicted using each of those different procedures (or facsimiles of those procedures).

Thirteen Dropout Identification Procedures

During the course of the program reviews described earlier, 16 specific procedures for identifying potential dropouts were found. Of that total set of 16, three were rejected for the following reasons: two of the procedures involved the use of published instruments and, in addition, were developed in the 60s; one requires the administration of a cumbersome multi item scale to students; and one (a regression analysis) contained insufficient results to allow it to be operationalized. The information available regarding each of the 13 procedures that were studied, included the following:

- a listing of the specific variables to be used as part of the identification process

[2]Although several other procedures were alluded to in the available program descriptions, insufficient information was provided to adequately describe them. Furthermore, other procedures may have been used in different programs, but they were not identifiable given the information reported in the source documents.

- operational definitions (of variant quality and utility) and "cut-off points" for each of the variables specified
- a specific decision rule for aggregating information across the variables used and for designating each student evaluated as either a potential dropout or not a potential dropout (i.e., a completer)

Subsequently, each of the procedures identified was arrayed in terms of a standard format. It was assumed this standardization would facilitate completion of evaluative comparisons among the procedures considered.

The 13 "standardized" identification procedures alluded to are summarized in exhibits 2 through 14.

EXHIBIT 2

POTENTIAL EARLY LEAVER PROFILE AND RELATED DECISION RULE

STUDENT NAME: _____ (Completed by staff person) _____

Variables	Indicators	*Assessments
1. Age	Two or more years older than classmates	_____
2. Physical size	Small or large for class group	_____
3. Health	Frequently ill, fatigues easily	_____
4. Academic achievement	One or more years behind in basic skills areas	_____
5. Father's occupation	Unskilled or semi-skilled	_____
6. Parent's education level	Grade 7 or below	_____
7. Number of children in family	Five or more	_____
8. School to school transfers	Pattern of jumping from school to to school	_____
9. Learning rate	Below 90 IQ or 30th percentile	_____
10. General adjustment	Fair or poor	_____
11. Parents attitude toward graduation	Negative or vacillating	_____
12. Broken home	Absence of father or mother or both from family	_____
13. School activities	Little or no participation	_____
14. Out of school activities	Little or no participation	_____
15. Attendance	Chronic absenteeism (20 or more days per year)	_____
16. School grades	Predominantly below grade of "C"	_____
17. Reaction to school control	Resents control	_____
18. Acceptance by peers	Not liked by fellow students	
19. Student's interest in school work	Little or no interest	
20. Ability to read	Two or more years below grade level	

*Place a "✓" in this column for each variable on which the student would be rated as exceeding the indicated value, level, or condition.

DECISION RULE: If five or more of the designated variables are checked, the student is classified as a potential early leaver.

SOURCE: Fox, W.M. and Elder, N. A Study of Practices and Policies for Discipline and Dropouts in Ten Selected Schools. North Country, NY; North Country High Schools, 1980. (ERIC Document Reproduction Service No. ED 191-974).

EXHIBIT 3

THE DROPOUT ALERT SCALE AND RELATED DECISION RULE

STUDENT NAME: _____ (Completed by student) _____

QUESTIONS	RESPONSES		SCORES ASSIGNED PER RESPONSE
1. How old are you relative to the other students in your class?	__Same age __Two years older	__One year older __Three years or more older	0, 1, 2, 3
2. Are you failing any of your subjects this semester?	__None __Two	__One __Three	0, 1, 2, 3
3. How many subjects have you failed prior to this semester?	__None __Two	__One __Three	0, 1, 2, 3
4. How much time do you spend reading a day?	__Two hours or more __Fewer than 30 minutes	__One hour __30 minutes __None	0, 1, 2, 3, 4
5. Have you ever failed a grade in elementary school?	__None __Two	__One __More than two	0, 2, 4, 8
6. Are you getting enough out of school?	__Usually __Never	___Seldom	0, 1, 2
7. How many days have you missed school this year?	__0 to 9 days __20 to 30 days	__10 to 19 days __More than 30 days	0, 2, 4, 8
8. Do you like the other students in your classses?	__Almost all of them __A few of them	__Most of them __Almost no one	0, 1, 2, 3
9. How do you like school?	__Very much __Little	__Much __Very little	0, 1, 2, 3
10. Do you attend school ball games, dances, parti s, etc.	__Never __Often	__Seldom __Very often	3, 2, 1, 0
11. How much do you think your teachers like you?	__Very much __Little	__Much __Very little	0, 1, 2, 3
12. How well do you like your teachers?	__Very little __Little	__Much __Very little	0, 1, 2, 3
13. How do you get along with other students in your class?	__Very well __Not very well	__Well __Not at all	0, 1, 2, 3
14. How many friends do you have in school?	__More than 15 __5 to 9	__10 to 15 __Less than 5	0, 1, 2, 3

continued

EXHIBIT 3--continued

QUESTIONS	RESPONSES		SCORES ASSIGNED PER RESPONSE
15. To how many school teams or clubs do you belong?	__None __3 or 4	__1 or 2 __More than 4	8, 4, 2, 0
16. How far did your father go in school?	__12 grade or higher __1st to 7th grade	__8th to 11th grade __Did not go to school	0, 2, 4, 8
17. How far did your mother go in school?	__12 grade or higher __1st to 7th grade	__8th to 11th grade __Did not go to school	0, 2, 4, 8
18. Do you think your parents:	__Want you to finish high school? __Don't care if you do or do not finish high school? __Discourage you from finishing high school?		0, 2, 4
19. In your school work, do your parents:	__Encourage you often __Encourage you rarely	__Encourage you sometimes __Discourage you	0, 1, 2, 3
20. Do you live with:	__Both your mother or father __Other relatives	__Either your mother or father	0, 1, 2, 3 __No relatives
21. Do you work outside of school?	__On a regular basis __Rarely	__Sometimes __Never	3, 2, 1, 0
22. How many brothers and sisters do you have?	__None __3 or 4	__1 or 2 __More than 4	0, 1, 2, 3
23. Do you feel tired?	__Never __Often	__Seldom __Very often	0, 1, 2, 3
24. Do you have any trouble with the other students or teachers?	__Never __Often	__Seldom __Very often	0, 1, 2, 3

DECISION RULE*: 39 or greater - strong potential dropout
19 to 38 - moderate potential dropout

*Special attention should be given to items 1, 2, 3, 7, 10, 15, 16, and 17 as they are highly predictive of dropouts.

SOURCE: Cage, B.M. and Karnst, R. Implementation of a Dropout Prevention Program in Northeast Louisiana Parishes and Academies. (Final Report). Monroe, Louisiana: Northeast Louisiana University, ND.

EXHIBIT 4

STAY-IN-SCHOOL SURVEY AND RELATED DECISION RULE

STUDENT NAME: Completed by staff person

Variables	Indicators		Assessments*
1. Physical size	__Small or large for age	__Average size size	1, if small or large for age
2. Hygiene/Dress	__Low standard	__Average or above	1, if low standard
3. Grades	__Predominantly "C" or below	__Above "C"	1, if "C" or below
4. Attendance	__About 20 or more days per year	__Seldom absent	1, if absent 20 or more days
5. Grade in school	__Retained one or more years	__At correct grade level	1, if retained one or more years
6. Ability to read	__Functions below grade level	__At or above grade level	1, if functions below grade level
7. Performance on aptitude or achievement tests	__Poor results	__Average to good	1, if poor results
8. General adjustment to school	__Poor	__Average to good	1, if poor
9. General adjustment to peers	__Poor	__Average to good	1, if poor
10. Study habits	__Poor	__Average to good	1, if poor
11. Interest in school work	__Little shown	__Average to high	1, if shown
12. Parental interest in student's education	__Little or none	__Average or active	1, if little or none
13. Self-concept	__Poor	__Satisfied with self	1, if poor
14. Sex (sexual interest or preoccupation)	__High interest for age	__Average to low interest	1, if high for age

* Assign a one in this column if the student met or exceeded the criterion value indicated.

DECISION RULE: If 3 or 4 ones were assigned, then the student is classified as a borderline dropout; if five or more one's were assigned, then the student is classified as a bonified dropout.

SOURCE: Murray County Georgia Public Schools, ND.

EXHIBIT 5

VARIABLES AND DECISION RULE USED
BY KENTUCKY DEPARTMENT OF EDUCATION

STUDENT NAME: Completed by staff person

VARIABLE(S)	INDICATOR	ASSESSMENTS*
1. Achievement as assessed by GPA.	Achieving 2 or more grade levels below age group	
2. Poor academic skills as assessed by grades (i.e., F's)	Has failed 2 or more subjects in two of past four school years	
3. Unexcused absences and low GPA	Absent 25 or more unexcused days during last 2 years and has an overall GPA below C (i.e., 2.0)	
4. Suspensions and low GPA	Has been suspended (in-school and home suspensions) 2 or more times during past school year and has an overall GPA below C (i.e., 2.0)	

*Place a "√" in this column for each variable on which the student would be rated as exceeding the indicated value, level, or condition.

DECISION RULE: If two or more of the designated variables are checked, the student is classified as a potential dropout.

SOURCE: Kentucky State Department of Education, ND.

EXHIBIT 6

DROPOUT PREDICTION INSTRUMENT AND RELATED DECISION RULE

STUDENT NAME: _____ (Completed by staff person) _____

VARIABLE	INDICATOR	ASSESSMENTS*
1. Attendance	Days absent last full year scaled as Up to 20 = 1, Up to 40 = 2, Up to 60 = 3, and UP to 80 = 4	_____
2. Years repeated	Number of years not promoted scaled as 1 repeat = 1, 2 repeats = 2, 3 repeats = 3, etc.	_____
3. GPA	Grade point average scaled as 3 or 4 = 0, 2 = 1, and 1 = 2.	_____
4. Alternative school	Any behavior placement in an alternative school scaled as yes = 1 and no = 0.	_____
5. Parents in home	One or two parent home scaled as 1 parent = 1 and 2 parents = 0.	_____
	TOTAL =	_____

*Place the scale value on each variable that is appropriate for the student in this column.

DECISION RULE: Students are classified as follows:
- TOTAL ranges from 0 to 4 = graduate
- TOTAL is 5 and above = dropout

SOURCE: Nichols, C. Personal Communication. Harrisburg, PA: Harrisburg School District, 1988.

EXHIBIT 7

SVAN SCALE AND RELATED DECISION RULE

STUDENT NAME: _____ (Completed by staff person)

VARIABLE	INDICATOR	ASSESSMENTS*
1. Academic lagging	Reading or arithmetic a year or more retarded	_____
2. Family mobility/ movement	Attended several elementary or secondary school	_____
3. Retention	Failure of a year of elementary or secondary school	_____
4. Newness to school/area	A newcomer to school/area from a small town or rural area	_____
5. Low economic level at home or low education level of parents	Low economic level or low education level for parents	_____
6. Broken home	Broken home	_____
7. School attendance	Irregular attendance	_____
8. School adjustment or participation in activities	Difficult school adjustment or no participation in school activities	_____
9. Problems with law	Problems with police or other agencies	_____
10. Communal living	Lives in a communal setting (e.g., an extended family setting involving crowding)	_____
11. Emotional nature	Highly unstable emotional qualities	_____
	TOTAL =	_____

*Place a "✓" in this column for each variable on which the student would be rated as exceeding the indicated value, level, or condition.

DECISION RULE: Complete the total number of checks (✓'s), then interpret the results as follows:

TOTAL	ESTIMATED PROBABILITY OF DROPPING OUT
1	16 chances in 100
2	34 chances in 100
3	46 chances in 100
4	68 chances in 100
5	72 chances in 100
Over 5	Over 72 chances in 100

SOURCE: Dalton School District, Dalton, Georgia, ND.

EXHIBIT 8

DROPOUT PREDICTION TABLE AND RELATED DECISION RULE

STUDENT NAME: _____

VARIABLE	INDICATOR	ASSESSMENTS*
• SCHOOL		
1. Low academic performance	-Two years behind in reading or math at 7th grade level; majority of grades below average	_____
2. Retention	-Failure of one or more school years	_____
3. Attendance/Tardiness	-Irregular attendance and frequent tardiness (with ill-defined sickness given as reason)	_____
4. Performance-potential discrepancy	-Performance consistently below potential	_____
5. Involvement in extra-curricular activities	-No participation in extracurricular activities	_____
6. Family mobility	-Frequent change of schools	_____
7. Behavior	-Behavior problems requiring disciplinary measures	_____
8. Acceptance	-Feeling of "not belonging" (because of size, speech, personality, nationality, social class, etc.)	_____
• FAMILY		
9. Family size & control	-More children than parent(s) can control (e.g., for divorced and working mother)	_____
10. Parental consistency	-Parent(s) inconsistent in affection and discipline	_____
11. Family situation	-Unhappy family situation (e.g., communication and pleasurable experiences lacking)	_____
12. Presence of Father	-Father figure weak or absent	_____

continued

Exhibit 8--continued

13. Parental education	-Education of parents at eighth grade level	_____
14. Family friends	-Few family friends and among those few many have problems (e.g., divorced, deserted, dropouts)	_____
• PEERS		
15. Parental approval of friends	-Friends not approved by parents	_____
16. School orientation of friends	-Friends not school oriented	_____
17. Ages of friends	-Friends much older or much younger	_____
• PSYCHOLOGICAL ORIENTATION		
18. Acceptance of authority	-Resentful of all authority (e.g., home, school, police, job, church)	_____
19. Deferred gratification pattern	-Deferred gratification pattern weak	_____
20. Self-image	-Weak self-image	_____
	TOTAL =	

* Place a "✓" in this column for each variable on which the student would be rated "high" on that variable.

DECISION RULE: None specified only that "the greater the number of negative factors working to the disadvantage of the pupil, the greater the chances of his (her) dropping out of school." (p. 199)

SOURCE: Cervantes, L. F. The Dropouts: Causes and Cures. Ann Arbor: The University of Michigan Press, 1965.

EXHIBIT 9

DROPOUT SCREENING TABLES AND RELATED DECISION RULES

STUDENT NAME: _____ NUMBER OF STUDENTS SERVED BY SCHOOL SYSTEM: _____

VARIABLE	INDICATOR	ASSESSMENTS*
1. Scholastic record	+5 if A or B; +1 if C; -2 if D; and -5 if F	_____
2. Peer acceptance	+5 if sought out; 0 if accepted; -2 if tolerated; and -4 if avoided	_____
3. Mental ability (IQ)	+3 if greater than one standard deviation from x; +1 if from x to +one standard deviation; -1 if from x to -one standard deviation; and -4 if less than one standard deviation from x.	_____
4. Mother's education	+4 if college; +3 if vocational or business; +1 if high school graduate; -1 if grade 9 to high school graduate; and -3 if grade 8 or below.	_____
5. Father's education	+4 if college; +2 if vocational or business; +1 if high school graduate; 0 if grade 9 to high school graduate; and -2 if grade 8 or below.	_____
6. Father's occupation	+3 if professional, technical or managerial; +1 if sales, merchandising, accounting, clerical; 0 if skilled, semi-skilled, service or farming; and -2 if unskilled or unemployed.	_____
	TOTAL (ALGEBRAIC SUM) =	_____

*Insert the value (or "score") for the student on each of the indicated variables (i.e., variables 1, 2, ..., 6), if the number of students served by the school system (K through 12th grade) is less than 4,000; insert the values for the student on variables 1, 2, 3, and 4 only, if the number of students served by the school system is greater than 4,000.

DECISION RULE: If the TOTAL (algebraic sum) is negative, the student would be identified as a potential dropout.

SOURCE: Dudley, S. O. Report of Indiana Public School Dropout - Graduate Prediction Study. South Bend: School of Education, Indiana University, South Bend, 1971.

EXHIBIT 10

POTENTIAL DROPOUT PROFILE AND RELATED DECISION RULE

STUDENT NAME: _____

VARIABLE	INDICATOR	ASSESSMENTS*
1. Attendance	- 18 or more occurrences of absences in one school year--Fridays and Mondays count as two absences each.	_____
2. Age relative to classmates	- Two or more years older than the average age for the grade level in which enrolled.	_____
3. Reading level	- Reading stanine less than 4.	_____
4. Number of schools attended	- Three or more schools attended.	_____
5. Grades	- Three or more D's and F's for the most current grading period.	_____
6. Discipline problems	- Total days of in-school or out-of-school suspensions in one year.	_____
	TOTAL =	_____

*Place a "√" in this column for each variable on which the student would be rated as being at the indicated level on that criterion.

DECISION RULE: A student would be viewed as a potential dropout if the number of criteria checked is greater than or equal to two.

SOURCE: Dade County School District, ND as reported in Dropout Prevention: A Manual for Developing Comprehensive Plans prepared by the Florida Department of Education, September, 1986.

EXHIBIT 11

POTENTIAL DROPOUT REFERRAL FORM AND RELATED DECISION RULE

STUDENT NAME: _____

VARIABLE	INDICATOR	ASSESSMENTS*
1. School achievement	- Underachieving	_____
2. Attendance	- Poor attendance	_____
3. Reading or math performance	- Significant difficulties in reading or math	_____
4. Emotional problems	- Evidence of emotional problems, e.g., very low self-esteem, disruptive	_____
	TOTAL =	_____

*Place a "✓" in this column for each variable on which the student would be rated as being at the indicated level on that criterion.

DECISION RULE: A student would be viewed as a potential dropout if the number of criteria checked is greater than or equal to one.

SOURCE: West Virginia Research Coordinating Unit for Vocational Education. Brief Guidelines on Information and Strategy for Dropout Prevention in West Virginia. Huntington, WV: Author, 1984.

EXHIBIT 12

INDICATORS FOR RECOGNIZING A POTENTIAL DROP-OUT OR "AT-RISK" STUDENT

STUDENT NAME: _____ (Completed by staff person) _____

	Variables	Indicators	*Assessments
1.	Member of poor family	Family income is at or below poverty level	_____
2.	Attendance	Student has a poor attendance record	_____
3.	Attendance and retention	Student has a poor attendance record, including failure to advance to next grade	_____
4.	Basic skills deficiency	Student has a significant deficiency in basic skills	_____
5.	Too few credits to graduate	Student has insufficient credits to graduate in senior year	_____
6.	Emotional/Behavioral problems	Student has documented emotional or behavioral problems that may result in suspension	_____
7.	Teen parent or pregnant	Student is a teen parent or a pregnant girl	_____
8.	Former dropout	Student formerly dropped out of school and returned	_____
9.	Enrolled in alternate school or program	Student is enrolled as a public alternate school or alternate school program	_____
10.	Enrolled in in-school dropout program	Student is enrolled in a special in-school program designed for potential dropouts	_____

*place a "✓" in this column for each variable in which the student would be rated as exceeding the indicated value, level, or condition.

DECISION RULE: If two or more of the designated variables are checked, the student is classified as a potential dropout

SOURCE: Nevada Occupational Education System. "At-Risk" Students--A Discussion Paper. Carson City: The Nevada State Department of Education, 1987.

EXHIBIT 13

DROPOUT PREDICTION (Austin Descriminant Equation)

STUDENT NAME: _____ (Completed by staff person) _____

Variables	Indicators	Weights*
1. Grade Point Average (GPA)	- Based on classroom averages where below 70=F, 70-74=D, 75-79=C, 80-89=B, and 90-100=A	.122
2. Grade in which Enrolled (68%-9th; 25% below; 7% above for age)	- Based on age (i.e., birthdates indicated that students should be 9th graders, ∴ 8=below grade, 9=at grade, 10=above grade	.618
3. Black vs. Other Ethnic Orgins	- 1 for a black student and 0 if a non-black student	.632
4. Discipline Problems	- Number of serious discipline problems (suspensions, corporal punishment, etc.) in which the student was involved during the preceding year (0=none, 1=one, etc.)	-.152
5. Sex	Female=3; Male=1	-.126
6. Constant	- All students assigned a 1	-15.547

*Multiply the value (or "score") for the student on each of the indicated variables (i.e., variables 1, 2, ..., 6) by the indicated weight and then find the algebraic sum of those products.

DECISION RULE: If the algebraic sum calculated is $\leq$ -0.357, the student would be classified as a potential dropout.

SOURCE: Curtis, J.; Macdonald, J.; Doss, D.; and Davis, W. "Dropout Prediction," a paper presented at the AERA Convention, Montreal, Canada, 1983.

EXHIBIT 14

IDENTIFYING POTENTIAL DROPOUTS (9th Grade Total)

STUDENT NAME: _____ (Completed by staff person) _____

Variables	Indicators	Weights*
1. Days absent in 3rd grade	- Number of days absent in 3rd grade	-.006
2. Days absent in 6th grade	- Number of days absent in 6th grade	-.009
3. Days absent in 8th grade	- Number of days absent in 8th grade	-.005
4. Reading Stanine Score-Elem. Gr.	- Reading stanine score on test admin. in grades 1-6	.064
5. Reading Stanine Score-High Sch.	- Reading stanine score in test admin. in grades 7-12	.049
6. Total number of retentions	- Number of retentions over school career	-.115
7. Age	- Chronological age of student	-.080
8. Education Level of Father	- Scored as: 8th gr or less=5; H.S., but not graduate=4; H.S.Grad.=3; College, but not graduate=2; College Grad.=1	-.028
9. Income	- Approximate annual household income: Under 4,999=6; 5,000 to 9,999=5; 10,000 to 14,999=4; 15,000 to 19,999=3; 20,000 to 24,999=2; and 25,000 or more=1	-.025
10. Misbehavior (Jr. High)	- Number of times sent to principal's office during junior high school	-.035
11. Hrs. Worked per Week-(Non-Farm Jobs)	- Number of hours worked per week on a non-farm job	-.006
12. Grades in which participated in extra-curricular activities	- Number of grades in which the student was involved in extra-curricular activities	-.013
13. Constant	- All students assigned a 1	1.789

*Multiply the value (or "score") for the student on each of the indicated variables (i.e., 1 to 13) by the indicated weight and then find the algebraic sum of those 13 products.

DECISION RULE: If the algebraic sum calculated is $\leq .47$, the student would be classified as a potential dropout.

SOURCE: Martin, D.L. Identifying Potential Dropouts: A Research Report. Frankfort, KY: Office of Research and planning, Kentucky State Department of Education, 1981.

Evaluation of the 13 Identification Procedures

Only 16 of the more than 100 dropout prevention programs reviewed were found to utilize formalized identification procedures and none reported any follow-up evaluations of the procedures they employed. Given this informational void, an effort was made to evaluate 13 of those procedures (i.e., those involving unpublished instrumentation/forms) for which adequate descriptions were available (either from the source documents or the authors of those documents). These evaluations were conducted using data from the nationally representative sample of approximately 27,500 students (2100 of whom dropped out of high school between their sophomore and senior grades) included in the sophomore cohort of the High School and Beyond--HS&B--(1983) database. More specifically, an effort was made to find specific elements in the HS&B database that corresponded with and could be used to operationally define the variables listed under the different dropout identification procedures described in exhibits 2 through 14. In certain cases, i.e., for certain variables, very close matches were found; for other variables several database elements needed to be combined to define the associated variables or proxies for those variables; and for a few of the variables, no matching database elements were available.

Given the variables operationalized via the HS&B database elements, each of the 13 dropout identification procedures was used to predict which students in the database would be dropouts. The results of those predictions were subsequently compared with

the known dropout figures available for the HS&B sample, i.e., 2100 of the 27,500 students in the sample. This approach provided not only a vehicle for assessing the "goodness" of each of the 13 different identification procedures, but also provided a basis for making comparisons across those different procedures. The resulting evaluations were summarized in terms of decision tables like those used in figures 2 and 3.

The results of the 13 evaluations that were undertaken are summarized in figure 4. A review of the information shown in that figure suggests the following:

1. For several of the instruments the data available via HS&B did not replicate the results that would have been expected, and too few or too many potential dropouts were identified when using the corresponding decision rules. For example, the procedures presented in exhibits 2, 9, 11, 13, and 14 yielded far greater percentages of potential dropouts than actual dropouts in the available sample. Likewise, the procedures in exhibits 3 and 7 were very conservative in this regard. In all of these cases, except exhibit 11, changes in the associated decision rules (i.e., cut-off points) could be used to alleviate the large differences originally noted.

2. Given the "best" rules identified for tested procedures (i.e., those denoted as "best" in Figure 4--predicted approximately the same number of dropouts as found in the sample and yielded the highest proportion of actual dropouts to completers among those predicted as dropouts--see appendix C) it would appear that the procedures described in exhibits 5, 6, 8, 10, 13, and 14 would be the ones recommended most for general use. For example, if one had a prevention program in operation and needed to screen referrals to that program (since only a subset of those referred could participate because of physical/space or fiscal limitations), one of the six designated procedures would probably be the most appropriate to use in such an instance.

3. Given the empirical results presented above, as well as practical limitations such as the numbers and types of data required when using the 13 tested procedures, it would appear that the procedures shown in exhibits 5, 6, 10, 13 and 14 would be the best, overall.

PROCEDURE	PREDICTIVE RESULTS

- Potential Early Learner Profile and Related Decision Rule (Exhibit 2)

		PREDICTED CLASSIFICATIONS		
		Completers	Dropouts	n's per Group
Actual Classification:	Completers	21,312	3,385	24,697
	Dropouts	1,260	1,161 (.26)	2,421
n's-Predicted Groups		22,572	4,546	27,118

Other Findings:

(1) If the variables are used in a discriminate analysis, the 14 key ones (best to poorest) would be 1, 15, 16, 8, 4, 17, 12, 19, 13, 6, 7, 14, 2, and 3. The resulting overall classification would be 83% with 25% of the predicted dropouts being actual dropouts.

(2) If the cut-off point were set at 6[a], 7, or 8 instead of 5, the resulting percentages of predicted dropouts who would be actual dropouts would be 32, 39, and 42, respectively.

- The Dropout Alert Scale and Related Decision Rule (Exhibit 3)

		PREDICTED CLASSIFICATIONS		
		Completers	Dropouts	n's per Group
Actual Classification:	Completers	24,335	342	24,697
	Dropouts	2,142	279 (.45)	2,421
n's-Predicted Groups		26,497	621	27,118

Other Findings:

(1) If the cut-off point were set at 24[a], 25, 26, 27, 28, 29, or 31 instead of 30, the resulting percentages of predicted dropouts who would be actual dropouts would be 31, 33, 36, 38, 41, 43, and 47, respectively.

[a]The best of these rules, given the HS&B sample.

continued

Figure 4. Predictive results for the 13 dropout identification procedures.

Figure 4--continued

PROCEDURE	PREDICTIVE RESULTS			
• Stay-In-School Survey and Related Decision Rule (Exhibit 4)		PREDICTED CLASSIFICATIONS		
		Completers	Dropouts	n's per Group
	Actual Classification: Completers	23,414	1,283	24,697
	Actual Classification: Dropouts	1,788	633 (.33)	2,421
	n's-Predicted Groups	25,202	1,916	27,118
Other Findings:	If the cut-off point were set at 3 or 4 instead of 5[a] the resulting percentages of predicted dropouts who would be actual dropouts would be 22 and 28, respectively.			
• Variables and Decision Rule Used by Kentucky Department of Education (Exhibit 5)		PREDICTED CLASSIFICATIONS		
		Completers	Dropouts	n's per Group
	Actual Classification: Completers	22,983	1,714	24,697
	Actual Classification: Dropouts	1,604	817 (.32)	2,421
	n's-Predicted Groups	24,587	2,531	27,118
Other Findings:	If the cut-off point were set at 1 or 3 instead of 2[a] the resulting percentages of predicted dropouts who would be actual dropouts would be 22 and 41, respectively.			
• Dropout Prediction Instrument and Related Decision Rule (Exhibit 6)		PREDICTED CLASSIFICATIONS		
		Completers	Dropouts	n's per Group
	Actual Classification: Completers	23,609	1,088	24,697
	Actual Classification: Dropouts	1,698	723 (.40)	2,421
	n's-Predicted Groups	25,307	1,811	27,118
Other Findings:	If the cut-off point were set at 3 or 4 instead of 5[a] the resulting percentages of predicted dropouts who would be actual dropouts would be 20 and 30, respectively.			

[a]The best of these rules, given the HS&B sample.

continued

Figure 4--continued

PROCEDURE	PREDICTIVE RESULTS			
• SVAN Scale and Related Decision Rule (Exhibit 7)		PREDICTED CLASSIFICATIONS		
		Completers	Dropouts	n's per Group
	Actual Classification: Completers	24,453	244	24,697
	Dropouts	2,244	177 (.42)	2,421
	n's-Predicted Groups	26,697	421	27,118
	Other Findings:	If the cut-off point were set at 3, 4[a], or 6 instead of 5, the resulting percentages of predicted dropouts who would be actual dropouts would be 27, 36, an 44, respectively.		
• Dropout Prediction Table and Related Decision Rule (Exhibit 8)		PREDICTED CLASSIFICATIONS		
		Completers	Dropouts	n's per Group
	Actual Classification: Completers	22,992	1,705	24,697
	Dropouts	1,734	687 (.29)	2,421
	n's-Predicted Groups	24,726	2,392	27,118
	Other Findings:	If the cut-off point were set at 4 or 6 instead of 5[a] the resulting percentages of predicted dropouts who would be actual dropouts would be 23 and 35, respectively.		
• Dropout Screening Tables and Related Decision Rules (Exhibit 9)		PREDICTED CLASSIFICATIONS		
		Completers	Dropouts	n's per Group
	Actual Classification: Completers	21,471	3,226	24,697
	Dropouts	1,482	939 (.23)	2,421
	n's-Predicted Groups	22,953	4,165	27,118
	Other Findings:	If the cut-off point were set at 1, 0, -2, -3, or -4[a] instead of -1, the resulting percentages of predicted dropouts who would be actual dropouts would be 20, 21, 24, 25, and 28, respectively.		

[a]The best of these rules, given the HS&B sample.

continued

Figure 4--continued

PROCEDURE	PREDICTIVE RESULTS			
• Potential Dropout Profile and Related Decision Rule (Exhibit 10)		PREDICTED CLASSIFICATIONS		
		Completers	Dropouts	n's per Group
	Actual Classification: Completers	22,175	2,522	24,697
	Dropouts	1,270	1,151 (.31)	2,421
	n's-Predicted Groups	23,445	3,673	27,118
	Other Findings: If the cut-off point were set at 3 or 4 instead of 2[a] the resulting percentages of predicted dropouts who would be actual dropouts would be 42 and 55, respectively.			
• Potential Dropout Referral Form and Related Decision Rule (Exhibit 11)		PREDICTED CLASSIFICATIONS		
		Completers	Dropouts	n's per Group
	Actual Classification: Completers	19,174	5,523	24,697
	Dropouts	1,141	1,280 (.19)	2,421
	n's-Predicted Groups	20,315	6,803	27,118
	Other Findings: If the cut-off point were set at 2 or 3 instead of 1[a] the resulting percentages of predicted dropouts who would be actual dropouts would be 34 and 33, respectively.			
• Indicators for Recognizing a Potential Drop-Out or "At-Risk" Student (Exhibit 12)		PREDICTED CLASSIFICATIONS		
		Completers	Dropouts	n's per Group
	Actual Classification: Completers	22,358	2,339	24,697
	Dropouts	1,597	824 (.26)	2,421
	n's-Predicted Groups	23,955	3,163	27,118
	Other Findings: If the cut-off point were set at 3[a] or 4 instead of 2 the resulting percentages of predicted dropouts who would be actual dropouts would be 31 and 35, respectively.			

[a]The best of these rules, given the HS&B sample.

continued

Figure 4--continued

PROCEDURE	PREDICTIVE RESULTS			
• Dropout Prediction (Austin Discriminate Equation) (Exhibit 13)			PREDICTED CLASSIFICATIONS	
			Completers	Dropouts	n's per Group
	Actual Classification:	Completers	14,990	9,616	24,606
		Dropouts	626	1,766 (.16)	2,392
	n's-Predicted Groups		15,616	11,382	26,998
	Other Findings:	Given the differences in data between the original study and HS&B, if the cut-off point were set at 1.75, 1.65[a], or 1.55 instead of -.35, the resulting percentages of predicted dropouts who would be actual dropouts would be 33, 31, and 29, respectively.			
• Identifying Potential Dropouts (9th grade total) (Exhibit 14)			PREDICTED CLASSIFICATIONS	
			Completers	Dropouts	n's per Group
	Actual Classification:	Completers	13,346	9,418	22,764
		Dropouts	296	1,661 (.15)	1,957
	n's-Predicted Groups		13,642	11,099	24,721
	Other Findings:	Given the differences in data between the original study and HS&B, if the cut-off point were set at .09, .17[a], .19, or 27 instead of .47, the resulting percentages of predicted dropouts who would be actual dropouts would be 38, 33, 32, and 26, respectively.			

[a]The "best" of these rules, given the HS&B sample.

Generally, if an identification procedure with a standardized or fixed cut-off point is needed, then the recommendations cited above would be appropriate. In some situations or applications such a fixed cut-off is not the critical factor, but rather one is concerned with identifying a subset of the predicted dropouts; more specifically, the subset that scored highest on the procedure-related scale. Such a situation would be reflected by the following example--

> Centertown High School (enrollment = 780 in grades 9 through 12) has an exemplary dropout prevention program in place. That program is set up to "accept" entering freshmen who are identified as potential dropouts and work with them throughout their high school careers. Given fiscal, personnel, and space constraints, the program can only accept 20 new participants each year. In order to help identify those new participants, the program staff uses dropout identification procedure x to generate a "dropout potential" score for each new freshmen. Subsequently the 20 freshmen with the highest "dropout potential" scores are invited to participate in the special program.

Given the context defined by the proceeding example, one might ask, "Which of the 13 identification procedures being evaluate would do the best job, i.e., result in inclusion of the most actual dropouts, in the sample identified via the highest scores on the associated 'dropout potential' criteria?" The results that would be obtained in such a case are summarized in table 4. As shown in the bottom row of that table, the "best" procedures among those evaluated are those presented in exhibits 3, 6, 10, 13 and 14. Given the practical considerations alluded to earlier in relation to the results found in figure 4, it would appear that the procedures in exhibits 6, 10, 13, and 14 would be

TABLE 4

THF PREDICTED NUMBERS OF ACTUAL DROPOUTS THAT WOULD BE IDENTIFIED FROM AN UNRESTRICTED POPULATION[a] USING EXHIBITS 2 THROUGH 14

Exhibit	Number of Students the Program can Handle at One Time (Cut-off Score Used) 10	25	50	75	100
2. Potential Early Leaver Profile	4 (≥11)	11 (≥11)	22 (≥10)	34 (≥10)	41 (≥9)
3. The Dropout Alert Scale	6 (≥44)	13 (≥42)	25 (≥40)	43 (≥38)	56 (≥37)
4. Stay-In-School Survey	5 (≥9)	13 (≥9)	24 (≥8)	36 (≥8)	48 (≥8)
5. Variables Used by Kentucky Department of Education	4 (≥4)	9 (≥4)	19 (≥4)	28 (≥4)	37 (≥4)
6. Dropout Prediction Instrument	5 (≥9)	15 (≥8)	31 (≥8)	40 (≥7)	54 (≥7)
7. SVAN Scale	4 (≥7)	11 (≥6)	22 (≥6)	33 (≥6)	42 (≥5)
8. Dropout Prediction Table	5 (≥9)	13 (≥9)	22 (≥8)	33 (≥8)	45 (≥8)
9. Dropout Screening Table	5 (≤-15)	13 (≤-13)	22 (≤-12)	34 (≤-11)	45 (≤-11)
10. Potential Dropout Profile	5 (≥5)	14 (≥5)	28 (≥4)	41 (≥4)	55 (≥4)
11. Potential Dropout Referral Form	3 (≥3)	8 (≥3)	17 (≥2)	26 (≥2)	34 (≥2)
12. Indicators for Recognizing a Potential Dropout	3 (≥6)	10 (≥5)	20 (≥5)	30 (≥5)	35 (≥4)
13. Dropout Prediction Equation	5	16	28	41	54
14. Identifying Potential Dropouts	5	15	33	42	53
The 4 exhibits per group size with the best "hit" rates	3;4;6; 8;9;10 13;14	13,14; 6;10	14;6; 10;13	3;14; 10;13	3;10; 6;13

[a]Assumes that no prediction of students has occurred, e.g., estimates are generated for all students in a school or for all entering freshmen in a high school.

the easiest to use as well as result in identification of the highest relative numbers of actual dropouts among the students selected form the overall sample.

In summary, the empirical evaluation results presented in figure 4 suggest that the "best" dropout identification procedures among those reviewed were the procedures presented in exhibits 5, 6, 10, 13, and 14, while the results presented in table 4 suggest that the "best" procedures are those found in exhibits 3, 6, 10, 13 and 14. When practical criteria, such as the numbers of variables employed in those procedures, are also considered, it is recommended that the "Dropout Prediction Instrument" (exhibit 6), the "Potential Dropout Profile" (exhibit 10), the "dropout Prediction Equation" (exhibit 13), or "Identifying Potential Dropouts Scale" (exhibit 14) be used

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APPENDIX A

*DISCRIMINANT FUNCTION USED TO IDENTIFY STUDENTS WHO COMPLETED HIGH SCHOOL BUT HAD A HIGH PROPENSITY TOWARD DROPPING OUT

Variable ID No.	Variable Description	Discriminant Function Coefficients	
		Unstandardized	Standardized
MWAGE80	Average hourly wage in manufacturing (1980)	-.039	-.059
WSCUSOTH	Region—West-South Central vs. other	-.141	-.043
ESCVSOTH	Region—East-South Central vs. other	-.152	-.035
CUNEMR80	Community unemployment rate—1980	-.010	-.026
SAVSOTH	Region—South Atlantic vs. other	-.037	-.013
SB014	Percent of students who dropout (1980)	-.009	-.077
SB056B	Percent of students who cut classes daily	-.025	-.019
SB017BY	Percent 10th grade in the academic program	-.001	-.015
SCHRULES	School rules enforced	-.009	-.009
SB0093S	Percent Hispanic students in school	-.000	-.003
BB046B	Father monitors school work	-.149	-.116
BYSES	Family SES	-.145	-.106
NREVSOTH	No religion vs. other	-.330	-.073
OCHVSOTH	"Other" Christian vs. other religions	-.170	-.040
OTHREL	Other relatives live in home vs. none	-.045	-.014
BB050B	Discussed post-high school plans with mother	-.015	-.007
YB049B	Mother helped with high school planning	-.007	-.005
YB003	Graduation plans?	1.838	.486
BB084	Age—over 16 vs. 16 and under	-1.822	-.344
YB011	Number of times moved since 5th grade	-.238	-.216
INTROV	Introverted vs. outgoing	-.080	-.175
BB115	Plan to go to college	.106	.160
BB017	Late to school?	-.108	-.127
BYTEST	Composite test score (1980)	.014	.121
ATTSCH	Attitude toward school	.118	.119
BLVSOTH	Ethnicity—black vs. other	.379	.112
BB050	Looking for work last week?	-.259	-.108
CONSTASK	Skill doing selected consumer tasks	-.081	-.100
ATHPART	Degree of participation in athletic activities	.177	.087
YB012	Attended vs. did not attend kindergarten	.254	.083
BB061A	Been in serious trouble with the law	-.427	-.081
YB006A	Number of math courses completed	.093	.074
BB105C	Number of black students in 9th-grade class	-.062	-.055
BBFAMILY	Family orientation	.071	.044
BB011B	Taken remedial math course?	.067	.031
BB088	Have a limiting physical condition?	-.104	-.026
	CONSTANT	-5.312	

Summary Statistics:	(1) Eigenvalue	(2) Canonical Correlation	(3) Wilks' Lambda	(4) Chi-square value for Lambda	(4) Significance of Chi-square
	.174	.385	.851	2482.8	p <.0000

NOTE: The variables in this table are organized in terms of the key elements identified in figure 1 (i.e., Contextual Variables, School Characteristics, Family Characteristics, and Individual Characteristics). In addition, dropouts were assigned to group #1 while completers were assigned to group #2.

SOURCE: Weber 1986, p. 13-14.

*For the less statistically oriented reader, discriminant analysis is a statistical procedure for using a set of descriptive variables (characteristics or properties of people or objects) to classify cases (people or objects) into groups. For example, a psychologist might wish to classify patients (people) into one of two groups, neurotic or psychotic, based upon 12 of their scores on the Minnesota Multiphasic Personality Inventory (MMPI). The application of discriminant analysis to this kind of problem would result in a linear combination of the patients' 12 MMPI scores (descriptive variables), which is called a discriminant function and can be used for classifying cases into one or the other of the two groups. If certain assumptions about the data are met, the discriminant function obtained is "optimal" in that it provides a classification rule that minimizes the numbers of errors made in classifying patients (cases) into the two groups.

APPENDIX B

SOURCES OF PROGRAM AND STUDY DESCRIPTIONS

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(3) A rough draft bibliography is attached with these two drafts. Two other bibliographies are available in Tina's file, where the Bhaerman materials should ultimately be returned.

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APPENDIX C

PREDICTIVE RESULTS FOR THE 13 DROPOUT IDENTIFICATION PROCEDURES WHEN "BEST" CUT-OFF POINTS ARE USED

PROCEDURE (Best cut-off point)	PREDICTIVE RESULTS: % Predicted[a] Dropouts	% Actual Dropouts Who Are Predicted Dropouts	% Predicted Dropouts Who Are Actual Dropouts
Potential Early Leaver Profile (Exhibit 2-6)	5.3%	19%	32%
Dropout Alert Scale (Exhibit 3-24)	8.1%	29%	31%
Stay-In-School Survey (Exhibit 4-5)	7.1%	26%	33%
Variables Used by KY Dept. of Educ. (Exhibit 5-2)[b]	9.3%	34%	32%
Dropout Prediction Instrument (Exhibit 6-5)[b]	6.7%	30%	40%
SVAN Scale (Exhibit 7-4)	5.2%	21%	36%
Dropout Prediction Table (Exhibit 8-5)[b]	8.8%	28%	29%
Dropout Screening Table (Exhibit 9--4)	7.0%	22%	28%
Potential Dropout Profile (Exhibit 10-2)[b]	13.5%	48%	31%
Potential Dropout Referral Form (Exhibit 11-1)	25.1%	53%	19%
Indicators for Recognizing Potential Dropouts (Exhibit 12-3)	4.1%	14%	31%
Dropout Prediction Equation (Exhibit 13-1.65)[b]	8.6%	30%	31%
Idenfitying Potential Dropouts (Exhibit 14-.17)[b]	7.8%	33%	33%

[a]The % of actual dropouts in the sample is 8.9%.
[b]One of the six "best" procedures in terms of the 3 predictive results.