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ABSTRACT

For students in most high schools, graduation is predicated on the successful completion of a specified number of courses or credits. In most cases when these students fail they are not retained in grade but become credit deficient. This report is concerned with a longitudinal study of loss of credit among high school students in the St. Paul (Minnesota) Public School District. For each course failed data were recorded on the following items: (1) student's demographic profile; (2) student's attendance record; (3) course information; and (4) teacher recorded information. An analysis of four years of data sought to find patterns and changes in the way failures had occurred. The findings showed that absenteeism was the best predictor of future credit loss and that dangerous patterns of absenteeism may begin as early as elementary school. The conclusions include the following: (1) absenteeism must be addressed in schools before it leads to credit loss; (2) teachers must expect and reward good attendance; (3) administrative actions must include both incentives for attendance and penalties for non-attendance; (4) the causes of absenteeism must be probed; and (5) minority students are more susceptible to the loss of credit than are white students. More studies of loss of credit are needed in other settings to address these concerns more thoroughly. Statistical data are included in 12 tables and 6 graphs. (VM)

LOSS OF CREDIT AND ITS IMPACT ON HIGH SCHOOL STUDENTS: A LONGITUDINAL STUDY

by

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Background of the Study

For the majority of students in North American high schools, graduation from school is predicated in large part on the successful completion of a specified number of courses or credits. Students who fail courses are a major concern for our high schools, yet research on academic failure has dealt almost exclusively with students who are retained in grade. At the secondary level, students who fail courses are generally not retained for a whole grade. More often, they become credit deficient.

Much other research has touched on credit deficiency as a secondary issue. The voluminous literature on dropouts has shown that dropouts often have fallen behind classmates before they ultimately leave. Research on truancy has shown that poor attendance and course failure go hand in hand. Research on low achievers includes students with poor grades, but it may not always refer to students who are specifically failing courses. All of these lines of research deal with students who fail courses, but not with the specific intent of examining the impact of course failure itself. To do so, we need to examine the full population of failing students, not just those who show up in some other group as well.

For the past four years, the St. Paul Public School District has been studying course failures in its secondary schools. The district has collected data on every course failure in Grades 7–12, including information about the student, the course, the teacher, reasons for failure, and interventions intended to prevent failure. Each semester, a series of reports summarizes the data on credit loss. The first section of this paper analyzes the data in these reports for the four years of the study.

Summary statistics only tell part of the story, however. They give a general picture but do not tell us what are the continuing effects of course failure. A longitudinal database such as this provides a unique opportunity to follow the progress of students who fail courses. Therefore, the second major section of this paper traces two cohorts of credit-deficient students through a three-year period, in an attempt to answer such questions as the following:

1. Can we identify a profile of the typical credit-deficient student? How early do the warning signs appear?
2. How do students recover from loss of credit?
3. Are there critical levels of credit loss beyond which recovery is dramatically less likely?
4. Poor attendance and loss of credit go hand in hand. Does one clearly precede the other?

A finding of the first section of this study led to the specific design of the second. The year of highest credit loss was Grade 9, dramatically higher than any other grade. Thus, the first cohort we studied were in Grade 9 in 1984-85 and were traced forward to 1986-87, when they likely were in Grade 11; the second were in Grade 9 in 1986-87 and were traced back to 1984-85 when they likely were in Grade 7. Each of these groups included over 500 students.

The Data Set

This study began in the second semester of the 1982-1983 school year. Since that time, data has been collected on every credit lost in every secondary school in the city. The data-gathering techniques were modified following the first semester of the study, so several analyses in this paper will begin with the data from fall semester of 1983, rather than spring of 1983.

The following information has been recorded for each course failure:

Information from the student's master record – name, student number, racial/ethnic code, sex, grade, days absent during the semester;

Information about the course – course number, subject area, teacher, class periods absent;

Teacher-reported information – reasons cited by the teacher for student's failure, actions taken by the teacher to prevent loss of credit, referrals made by the teacher to prevent loss of credit.

The student number makes it possible to trace the student's progress both prior and subsequent to the loss of credit. It also allows us to find other data in the student's master file, such as standardized test scores or past attendance records. Finally, it allows us to match the student's current address with a code which uses 1980 federal census data to classify the neighborhood in which the student lives as lower-income, middle-income, or upper-income.

Some Characteristics of the District

Independent School District No. 625 serves the City of St. Paul, Minnesota. The district enrolled 32,975 students in October, 1987, of whom 13,783 were in the secondary schools (Grades 7 – 12). Enrollments are increasing in the elementary schools, but are not expected to increase in the secondary schools for another three years.

Currently, 62% of the secondary students in the St. Paul Public Schools are White. The non-white population includes approximately 15% each of Black and Asian students (the latter being virtually all Southeast Asian refugees), 6% Hispanic and 2% American Indian. The non-white population is growing, largely due to a continuing influx of Asian students, while the White population continues a gradual decline that began in 1971.

Clarification of Terms

An important distinction needs to be drawn at this point. Some of the analyses deal with numbers of credits lost, that is, number of individual course failures. Other analyses tally numbers of credit-deficient students, that is, students failing one or more courses. Finally, some analyses combine the two to produce statistics on credits lost per credit-deficient student.

SECTION I
A SUMMARY OF FOUR YEARS' DATA

The district's original purposes in conducting this study were twofold. First, we were looking for patterns in the data. If stable patterns emerge, we at least know where to target our efforts. Second, we wanted to see if the patterns change over time. Thus, many of these analyses were conducted two ways –

1. grade-by-grade with the eight semesters collapsed, to look at overall patterns, and
2. semester-by-semester with all grades collapsed together, to look for changes in established patterns.

Analyses

The analyses for this section of the paper come primarily from the series of reports on credit deficiency that the district produces each semester. This series includes the following :

1. A summary of credits attempted and credits failed, by grade and race within school;
2. Tallies of failing students within each school, both by grade and race, and by grade and sex;
3. Tallies of failed credits by class absences, and of failing students by days absent;
4. Tallies of failed credits by grade and course number, and of failed credits by subject area;
5. Tallies by grade within school of all the teacher-reported information (reasons for student's failure, actions taken to prevent loss of credit, referrals made to prevent loss of credit).

The data from these semesterly reports have been transferred to spreadsheets that combine data from different semesters to yield both grade-by-grade and semester-by-semester breakdowns.

In addition, during the most recent two years of the study, we requested reports that allowed us to look at percentage of credit lost by subject area and some three-way breakdowns by race, grade, and sex.

Results

Percentage of Credit Lost

In a typical semester, students in St. Paul secondary schools attempt more than 70,000 credits. Of these 70,000 credits, about 5,000 are lost. Through the first five semesters of the study, percentage of credit lost increased from below 6% to slightly more than 7%. Since that time, the percent of credit lost has remained virtually constant, as Table 1 shows.

Insert Table 1 about here.

Credit loss is higher for Black, Hispanic, and American Indian students than for White or

Asian students. Figure 1 shows the trend across the semesters in credit loss, both for the district as a whole and for each racial/ethnic group. As this graph shows, the increase in the district-wide rate of credit loss has been mirrored most closely in the White and Hispanic populations. Credit loss for the Black population has remained around 13% throughout the study. The American Indian population has a higher rate of credit loss than the Black population but the number of students is too small to define a trend. Credit loss for Asian students is negligible.

Insert Figure 1 about here.

The first year of senior high school in the St. Paul system, Grade 9, has the highest rate of credit loss. This is true for all groups except Asian students, whose credit loss increases slightly from Grade 7 through Grade 11. For all groups except Asian students, Grade 12 is the year of least credit loss. Table 2 and Figure 2 show these trends.

Insert Table 2 and Figure 2 about here.

When we examine credit loss by subject area, we find the highest amounts of loss in the required subjects – English, Mathematics, Social Studies, Science, and Physical Education. This is to be expected, given that these subjects also have the highest enrollments. Therefore, for 1985-86 and 1986-87, we looked at credit failed as a percentage of attempted credit in each subject area. In both years, Mathematics had the highest failure rate overall, with English not far behind. Table 3 summarizes the district-wide data for the two years, including the breakdown between junior and senior high grades.

Insert Table 3 about here.

District officials have monitored the rates of credit loss in considerably greater detail than has been reported here. Of particular concern are wide discrepancies among the schools in the district or among departments within the same school. Teachers with inordinately high failure rates have come under scrutiny also, although this has been more a matter for building principals than for district administration.

Percentage of Credit-Deficient Students

The true impact of course failure is sensed when we examine the number of students who are failing one or more courses. Whereas approximately one credit in fourteen is failed, one student in six is failing at least one course. Thus, in an average semester, about 2500 students in St. Paul are failing at least one course. Similar patterns can be seen here as in the previous

analyses. The percentage of credit-deficient students grew for the first few semesters of the study, then more or less leveled off. This is shown in Table 4 and Figure 3. The percentage of credit-deficient students peaks in Grade 9, with approximately 25% of students failing at least one course. The percentages for American Indian, Black, and Hispanic students are higher than the district average, while White and Asian students are below it. Table 5 and Figure 4 document this.

Insert Tables 4 and 5 and Figures 3 and 4 about here.

There were more males than females in the credit-deficient population. This was true for all racial/ethnic groups and at all grade levels, but the difference is smallest at Grade 9. Figure 5 shows the average number of male and female students per semester who lost credit at each grade.

Insert Figure 5 about here.

The mean number of credits lost per failing student is 1.98. This figure is somewhat misleading, however, as the distribution is skewed. Over 1200 of the 2500 credit-deficient students per semester fail only one course. On the other hand, over 300 fail all, or all but one, of their courses. The amount of credit lost bears a direct relationship to the student's attendance. Those credit-deficient students who miss 10 or fewer days in the semester virtually never lose more than one credit, whereas those missing more than 30 days fail their entire load. This is illustrated in Figure 6, which relates the average number of credits lost to absences.

Insert Figure 6 about here.

Teacher-reported information

Teachers fill out a form for each credit lost, giving the reasons the student failed the course, teacher actions taken to prevent failure, and referrals made to third parties in an effort to prevent failure. The thoroughness of these data are highly variable from school to school and semester to semester, so they are best dealt with in the aggregate only.

Given four possible reasons for failure (poor attendance, assignments not complete, failed tests, and lack of effort), the teachers identified assignments not completed as the most common cause of failure (75 percent of cases), followed by poor attendance and lack of effort (62 percent each), and failed tests (59 percent of cases). The average number of reasons cited per case (2.6) was essentially the same at junior and senior high levels. In the junior high, fewer teachers reported poor attendance as a reason for failure than in the senior high. Conversely, fewer senior high teachers chose the "lack of effort" option. Neither of these differences were as pronounced as

some of the junior-senior high school differences in either actions or referrals, however. A more complete breakdown is shown in Table 6a.

The number of actions taken by teachers to prevent failure drops slightly between junior and senior high. The most common types of teacher actions were conferences with students and formal teacher notices sent to students who are in danger of failing, each being reported in 67 percent of cases. The least common action was a phone call home (used in only 26 percent of cases). Here there was a marked difference between junior and senior high teachers, with junior high teachers being approximately twice as likely to phone parents as are senior high teachers. An interesting point is that, although poor attendance was cited as a reason for failure in 62 percent of cases, teachers reported having made an attendance referral only 30 percent of the time. Table 6b gives a grade-by-grade summary of teacher actions.

Insert Tables 6a and 6b about here.

At all grades, the counselor was the most common third-party referral, followed by the assistant principal. The least common referrals were to homeroom teachers/advisors and to remedial reading. Third-party referrals showed sharp changes from junior to senior high. Not only did the average number of referrals drop dramatically between grades 8 and 9, but the types of referrals changed as well. Referrals to the school social worker fell from 22 percent in Grades 7 and 8 to just 5 percent in Grade 9 and 3 percent in each of the three remaining grades. Referrals to the principal, school nurse, remedial reading, and chemical dependency specialists similarly dropped markedly from junior to senior high. Table 7 presents more data on referrals as reported by teachers.

Insert Table 7 about here.

Teachers reported equal numbers of reasons for failure per lost credit at all grades. They also reported nearly equal numbers of teacher actions at both junior and senior high, so it is unlikely that the results just reported are due to any substantial difference in teacher attitudes to the reporting process itself. Rather, they would seem to represent some genuine differences between the two levels.

Discussion

Patterns of credit loss

The first purpose of the district in undertaking this study was to determine what patterns exist in loss of credit in our secondary schools. This summary of four years' worth of credit loss provides us with quite a stable picture of course failures, agreeing in general terms with much other

research on academic failure and low achieving students. It corroborates once again the strong relationship between poor attendance and academic difficulty (although it doesn't answer the question, "Which came first?"). It confirms previous research which has shown male students to be more prone to academic failure (and therefore, we assume, dropping out) and it demonstrates again the difficulties many students from racial and ethnic minorities face in our schools.

A recurring factor in the analyses has been the dramatic change in many patterns between junior and senior high school. Twenty-five percent of students in the district fail at least one course in each semester of Grade 9, nearly twice the rate for Grade 8. Over forty percent of Black and American Indian students fail at least one course in Grade 9. At the same time, patterns of teacher actions and referrals change as well. Parents are not as likely to be called, nor are the specialized support staff in the school as likely to be brought in. It seems that much more responsibility is being placed directly on the students at a time when they are trying to cope with a difficult transition in their environment. Not only are they suddenly the youngest students in the school, but the average senior high school in St. Paul enrols nearly three times as many students as does the average junior high. Student anonymity and a feeling of helplessness may be contributing factors in the sudden increase in credit loss in Grade 9.

To date, only one study has asked the students their opinions. This study dealt specifically with minority students who had failed at least three credits in Grade 9. The students readily admitted the things that they could have done to avoid credit loss (improve attendance, complete assignments, etc.), but they frequently commented that no one cared, that teachers didn't know them as people, and so forth. (Smith, 1986)

The decline in credit loss after Grade 9 is difficult to interpret. Does credit loss decline because students who are having problems are dropping out or are being retained in grade? Or do students get over their initial problems and experience greater success? Present data do not answer these questions.

Actions against credit loss

Within the St. Paul district, some actions have already resulted from the continuing scrutiny of course failures. On a large scale, they include a strong focus on improving attendance, and changes in promotion/retention policy. On a smaller scale, inordinately high failure rates in specific classes have sometimes been traced to actions of the teacher. Some of these have been easy to correct (such as inappropriate reading levels in important tests); others have proven more difficult. Occasionally a school has experienced uncharacteristically high failure rates for two or three semesters, then returned to its earlier rates. Administrators are much more conscious of credit loss, knowing that it has been subject to close scrutiny and take action when problems become evident.

Within the last two years, some new initiatives have been taken, both district-wide and by individual schools. Two schools (one junior high, one senior) have begun "Adopt-a-Kid" pro-

grams wherein each participating teacher "adopts" a student from those most at risk in the school. The specifics of each such relationship are left to the teacher and student, but the guidelines are that the teachers are to serve special roles for their "adoptees", checking on them regularly, encouraging them, and helping them with problems as they occur. A district-wide summer program labelled "Fresh Start" takes students who would be retained in junior high due to credit loss. Students work intensively on communication skills, mathematics, and "attitude" and are advanced to Grade 9 upon completion of the program. Teachers for this program are hand-picked and a follow-up team monitors the student closely during the Grade 9 year. Both these programs are two new to evaluate conclusively at this time, but preliminary evidence is encouraging.

An implicit assumption when this study began was that students who fail courses are automatically part of the "at-risk" population. This may not be true in all cases. For some students, a failed course may prove only a minor annoyance; for others it may be the first outward sign of impending academic trouble. For still others, it will continue a long-established pattern of academic difficulty. Section II of this paper tries to determine the ongoing effects of credit loss on the student.

SECTION II
FOLLOWING THE CREDIT-DEFICIENT STUDENT

The dramatic changes that occur in Grade 9 led to the design of a longitudinal study of credit-deficient students. This study looked at two cohorts of credit-deficient students over a three-year period during which patterns of credit loss have been stable. The first cohort (n = 542) consisted of all students who failed a course in Grade 9 in first semester of 1984-85. They were traced forward through 1986-87, when they likely were in Grade 11. The second cohort (n = 576) consisted of all students who failed a course in Grade 9 in first semester of 1986-87. They were traced back to 1984-85 when they likely were in Grade 7. In effect, this method yields a five-year study of credit-deficient students beginning two years before and ending two years after the year of greatest credit loss.

Variables

A longitudinal data file was built which contained the following variables for each student:

- Student number
- Race – recoded to two dummy variables to identify two non-white groups
  - Asian students
  - Black, Hispanic, and Native American students
- Sex (coded male = 1, female = 0)
- Neighborhood income code (based on 1980 census data), with
  - lowest 20% of neighborhoods = 2
  - middle 60% of neighborhoods = 5
  - upper 20% of neighborhoods = 8
- Days absent and days present — 1983-84 through 1986-87, by semester
  - recoded to percentage absenteeism, 1983-85 and percentage absenteeism, 1983-87
- Credits attempted through June, '87
- Credits earned through June, '87
- Grade Point Average as of June, '87
- Standardized test scores — fall, 1984 and fall, 1986
  - Reading Total
  - Math Total
  - Language Total
  - Ability test
  - Note: Scale scores were used in the analysis, but for reporting purposes, these were converted to Normal Curve Equivalents
- Last semester enrolled

Withdrawal code (if student is no longer in school)

Number of school transactions (entry, reentry, withdrawal) for 1984-87

For each semester from 84-85 to 86-87 (credit-deficient students only)

Number of credits lost

Subjects of credit loss (dummy codes for English. Mathematics, Social Studies, Science, Physical Education/Health, and Other)

Analyses

Initial analyses compared each of the credit-deficient groups to a sample of 300 students from the same year who had not failed any courses. A discriminant analysis compared each pair of groups on the following predictor variables: race, sex, neighborhood income code, number of school transactions, standardized test scores (reading, math, language, and ability tests) in fall of 1984, and percentage absenteeism in the two-year period 1983-85. For the first pair of groups, then, these comparisons focussed primarily on the differences present in Grade 9; for the second pair, it focussed on differences present in Grade 7. Subsequent analyses looked first on the 1984-85 cohort, then on the 1986-87 cohort.

For the 1984-85 credit-deficient cohort, the first analyses addressed the enrollment status of students in 1986-87. Two subgroups were selected, those who were still enrolled in school and those who had dropped out. Students who had moved out of the district were dropped from this analysis. A discriminant function identified variables from the list in the preceding paragraph that would warrant closer scrutiny. Chief among these were absenteeism, number of schools attended, and number of credits lost in Grade 9. For those students still enrolled, a multiple regression analysis used the same independent variables to predict total credit achieved by spring, 1987. Each of these initial analyses led to follow-up analyses which will be detailed in the "Results" section below.

For the 1986-87 credit-deficient cohort, a multiple regression analysis sought to predict number of failures in 1986-87 for those students who had been in district schools for the three-year period 1984-87. Independent variables included race, sex, neighborhood income code, number of schools attended during the three-year period 1984-1987, standardized test scores (scale scores in reading, math, language, and ability tests) in fall of 1984, number of failures in 1984-85, and percentage absenteeism in the two-year period 1983-85. The only variable making a significant contribution was absenteeism. Some subsequent analyses looked at the relationship between number of failures in 1984-85 and 1986-87, between 1983-85 absenteeism and 1986-87 course failures, and between 1983-85 absenteeism and 1986-87 absenteeism. Again, these follow-up analyses will be detailed in the "Results" section below.

Results

Differences between credit-deficient and comparison groups

The first pair of groups (those who had been in Grade 9 in 1984-85) showed differences between credit-deficient and comparison groups on most of the independent variables. Within-group standard deviations also differed on both absenteeism and number of school transactions, with the credit-deficient group showing much higher variability than the comparison group. Group means and standard deviations are shown in Table 8a. Four variables entered the discriminant function at the $p \leq .05$ level, in the following order: absenteeism in 1983-85, language test score, mathematics test score, and minority status (Black, Hispanic, or Native American). The discriminant function correctly classified 77.0% of the comparison group and 81.3% of the credit-deficient group. Details of the discriminant analysis are reported in Table 8b.

Insert Tables 8a and 8b about here.

The second pair of groups (those who were in Grade 9 in 1986-87) also showed between-group differences on most variables, but these differences were not as pronounced as for the first pair. Differences in within-group variability were also present for absenteeism, number of transactions, and language test scores. Group means and standard deviations are shown in Table 9a. Also included as a predictor variable in the discriminant function for these two groups was number of course failures in 1984-85 (the Grade 7 year). As the comparison group, by definition, had no failures, this variable might be expected to have an artificial effect on the discriminant function. In fact, it entered the discriminant function third, after absenteeism in 1983-85 and mathematics test score. Three further variables entered the function at the $p \leq .05$ level – Asian, minority (Black, Hispanic, and Native American), and number of transactions. This discriminant function correctly classified 84.7% of students from the credit-deficient group, but only 54.1% from the comparison group. Details of the discriminant analysis appear in Table 9b.

Insert Tables 9a and 9b about here.

Analyses of the 1984-85 credit-deficient group

A discriminant function predicting enrollment status in 1986-87 of those who failed a course in 1984-85 again showed absenteeism to be the strongest single predictor. Other variables entering this function at the $p \leq .05$ level included number of school transactions, neighborhood income level, and mathematics test score. The function correctly identified 89.0% of those who

would still be in school in 1986-87, but only 54.8% of those who would drop out. Details of this discriminant analysis appear in Tables 10a and 10b. The power of attendance as a predictor variable is easily shown by a simple cross-break. If we separated our sample at 20% absenteeism in Grade 8 and 9, we would correctly identify 75.8% of the continuing-enrollment group and 49.5% of the dropout group.

Insert Tables 10a and 10b about here.

For those students still enrolled in 1986-87, a multiple regression analysis was used to predict total credit achieved by spring, 1987. In this case, four variables entered the equation at the $p \leq .05$ level. They were, in order, number of credits lost in 1984-85, number of school transactions, absenteeism in 1984-85, and ability test score. Collectively they accounted for 27% of the variance in total credit. Details are reported in Table 11a. Number of credits lost in Grade 9 was not a strong predictor of number of credits lost two years later. In fact, of the 117 students who lost 4 or more credits in 1984-85 and who were still enrolled in 1986-87, 70 lost no credit in 1986-87. Crosstabulation of 1984-85 loss of credit and credit loss in the following two years appear in Table 11b.

Insert Tables 11a and 11b about here.

The relationships between the specific subjects failed in Grade 9 on the one hand, and enrollment status and credit achieved on the other were examined several ways. Neither regression analyses using subject-area variables as predictors nor crosstabulations of subject-area failures with the 1986-87 variables turned up any significant realtionships.

Analyses of the 1986-87 credit-deficient group

A regression analysis predicting number of credits lost in Grade 9 from Grade 7 variables (test scores, number of credits lost in Grade 7, absenteeism in Grades 6 and 7, race, neighborhood income code) saw only one variable, absenteeism in Grades 6 and 7, enter the equation at the $p \leq .05$ level. It explained 5% of the variance within the credit-deficient group. In a subsequent analysis, absenteeism in Grades 6 and 7 predicted 25% of the variance in absenteeism in Grade 9. (These are probably underestimates of explained variance as the analyses did not include those students who had not lost credit and may thus have suffered from range restriction.)

Number of credits lost in 1984-85 was to some degree indicative of credit lost in 1986-87, but many students with no credit loss in 1984-85 lost credit in 1986-87. For instance, of the 179 students who lost four or more credits in Grade 9 in 1986-87, 103 had lost no credit two years earlier. A crosstabulation of this group's credit loss for the two years appears in Table 12.

Insert Table 12 about here.

Discussion

The overwhelming finding of the above analyses is to document the value of absenteeism as a predictor of future academic difficulty. In predicting whether a student would lose credit in Grade 9, absenteeism in Grades 6 and 7 was the strongest predictor. Two points are particularly remarkable here. The first is that these analyses excluded students not in the system in 1984-85. If we assume that highly transient students are often at risk, we may have left the most extreme cases out of the analysis. The second point is that the mean level of absenteeism for the credit-deficient group was not one that would set off alarm bells (less than 10%), yet it was double that for students who would not lose credit (4.6%). By Grades 8 and 9, absenteeism in both groups had increased (to 16% and 6%) with the difference increasing beyond the 2 to 1 ratio. In looking at the continued enrollment status of those who failed courses in Grade 9, absenteeism in Grades 8 and 9, not number of credits lost in Grade 9 was the strongest predictor. Here the dropout group had approximately double the absenteeism of the non-dropout group (20% vs. 11%). In predicting number of credits achieved by Grade 11, absenteeism in Grades 8 and 9 again proved a stronger predictor than number of credits lo'. in Grade 9. No other variable in these analyses approached the consistent predictive power of absenteeism.

Of the remaining predictor variables, standardized test scores came up the most frequently. Usually, one or two test scores entered the prediction equations, with the language test and ability test appearing more frequently than mathematics or reading. However, their contribution to the equations was never particularly strong.

Other variables that contributed to explained variance in some analyses included number of school transactions, prior credit loss, and race. It is noteworthy that the contribution of race to prediction was not strong, given the large racial differences reported in Section I of this paper. It would seem that much of the variance explained by race is also explained by other, stronger predictors. Where race did enter the analyses, it was always in conjunction with absenteeism and at least one test score. This suggests that the effects of absenteeism and low skill levels may be more pronounced among Black, Hispanic, and Native American students than among Whites or Asians. The weak effect of prior credit loss is also noteworthy. Students who lose credit in Grade 9 can and do recover, especially if they have not shown patterns of high absenteeism.

Neither neighborhood income code nor subject area of the credit lost had much bearing on these analyses. Neighborhood income code in this case was only a crude measure of socio-economic status. It may not have been sensitive enough to pick up relationships between SES and credit loss. Unfortunately, no other indicator of the SES of individual students is available in the

current database.

One further point warrants discussion. Credit-deficient and non-credit-deficient groups showed differences in variability on some variables, as did dropout and continuing-enrollment groups. In most cases, the higher variability was found in the credit-deficient and dropout groups. Many dropout studies have pointed out that there is no such thing as a "typical" dropout. Rather, the issue is complex and multifaceted. Similarly, the high variability within the credit-deficient group suggests that, whereas a few characteristics seem common, there is no single pattern that identifies the potentially credit-deficient student. Even absenteeism, although highly predictive, is highly variable within the credit-deficient group. Any multi-faceted problem requires a flexible and multi-faceted response and it is to this response that we now turn.

CONCLUSIONS AND RECOMMENDATIONS

Most studies of academic failure deal either with dropouts or with students retained in grade. By addressing loss of credit, we had hoped to move one step closer to the roots of both the above issues. This in turn has led us to new issues that must be investigated, but it also has documented the need for action on several fronts. Chief among these are reducing absenteeism, smoothing the transition from junior to senior high school, and increasing sensitivity to racial/ethnic differences and their relationship to credit loss.

The most obvious conclusion of this study is that absenteeism must be addressed, if possibly, more vigorously than has already been done. It is also vital that absenteeism be addressed before the time of credit loss. Teachers must be a vital part of this effort. Currently, they report attendance referrals in only half of the cases where they state that attendance is a factor in loss of credit. As Figure 6 shows, a student missing 21 to 25 days per semester fails only two of five credits on the average. If teachers do not expect and reward good attendance, no administrative action can improve the situation. Actions must include both incentives for students to attend school and penalties for non-attendance. Incentives could be planned in conjunction with the business community and could include recognition awards such as special breakfast meetings, tickets to civic events, books, etc. Current penalties for poor attendance seem to have little effect on those with the highest rates of absenteeism, so new deterrents may be needed.

In addressing absenteeism, it is vital to probe its causes. When patterns of absenteeism first appear has not been shown by this study, but it is clear that relatively unalarming levels of absenteeism (10% or even less) in elementary school may already signal impending problems. If we fail to probe why students are not coming to school, we will only be treating a symptom, not a cause.

A second major conclusion of the first part of this study is that the transition from junior to senior high is a difficult one for many students, but actions can be taken to smooth this transition.

Credit loss in Grade 9 doubles over that in Grade 8. At the same time teachers, by their reported actions, are placing much more responsibility on students for their own learning. There is less direct contact between teachers and parents and fewer referrals are made to specialized support staff in the school. The change from junior to senior high must be made less abrupt. Actions could include strengthening homeroom/advisor relationships, establishing mentor programs with older students, assigning Grade 9 classes to teams of teachers specially recruited for their abilities with this age group, and improving contact between junior and senior high schools.

The relationship between race and credit loss has proven more complex than initial analyses would suggest. Whereas Black, Hispanic, and Native American students have higher rates of credit loss than White or Asian students, race *per se* does not seem to be the issue. Rather, effects of poor attendance and low academic skills seem to be more pronounced in the case of minority students. Smith (1986) found that many credit-deficient minority students had problems with specific teachers who they characterized as "uncaring, sarcastic, and not knowing how to teach." It is unclear whether white students would express the same opinions, but it is clear that many students have sensitivities that are not being noticed by some teachers. It is important that teachers and administrators be aware of these sensitivities as they take action on attendance and credit loss. Definitely, more study is needed to determine the factors that make minority students more susceptible than white students to loss of credit.

This study of credit deficiency has probed an aspect of academic failure that has not been adequately explored. However, it has merely scratched the surface of the issue. None of the questions we posed at the beginning of this paper has been decisively answered. We identified some of the characterisitcs of the credit-deficient student, but no single profile. We know that many students seem to recover from credit loss, but we still know little about how they do it. We have identified some factors that make recovery more likely but, curiously enough, amount of credit lost in Grade 9 is not among them. We have identified warning signs of impending academic difficulty, but we do not know how early they appear. While this study has drawn attention to many important points, it has probably raised more questions than it has answered. The current data can surely answer a few more of these questions, but more studies in other settings are also needed.

Table 1

Credits Attempted and Lost by Semester

Semester	Total Credits Attempted	Credits Lost	Percent of Credit Lost
83, Spring	72,577	4,039	5.6%
83, Fall	74,166	3,938	5.3%
84, Spring	72,646	4,387	6.0%
84, Fall	73,844	4,522	6.1%
85, Spring	71,280	5,146	7.2%
85, Fall	71,904.5	5,210	7.2%
86, Spring	69,209.5	4,951	7.2%
86, Fall	70,639	5,100	7.2%
87, Spring	67,707	5,003	7.4%
9-semester average	71,552.5	4,699.6	6.6%

Table 2

Percentage of Credit Lost by Grade and Ethnicity[1]

GRADE	RACIAL/ETHNIC GROUP					DISTRICT AVERAGE
	Amer. Indian	Black	Hispanic	White	Asian	
7	13.5%	9.1%	7.3%	3.8%	0.5%	4.8%
8	10.6%	9.4%	7.9%	4.1%	0.7%	5.0%
9	20.3%	18.8%	15.5%	8.7%	1.6%	9.9%
10	18.3%	16.7%	12.1%	7.0%	1.7%	8.0%
11	14.1%	15.7%	11.5%	6.3%	2.6%	7.2%
12	8.0%	8.6%	6.7%	3.6%	2.0%	4.1%

[1] Data shown are nine-semester averages.

Table 3

Rate of Credit Loss by Subject Area

SUBJECT	1985 - 86			1986 - 87		
	Grades 7 - 8	Grades 9 - 12	Combined	Grades 7 - 8	Grades 9 - 12	Combined
Mathematics	9.5%	12.2%	11.2%	6.7%	11.3%	9.6%
English	7.8%	11.9%	10.5%	6.0%	9.1%	8.0%
Science	9.3%	10.2%	9.8%	9.0%	7.5%	8.1%
Social Studies	7.3%	11.1%	9.6%	7.0%	8.0%	7.6%
Phys. Ed./Health	5.7%	12.9%	9.7%	4.5%	10.3%	7.7%
Business, Home Ec., Industrial Ed.	3.3%	10.4%	8.8%	2.9%	7.0%	6.1%
Fine/Performing Arts	5.6%	7.4%	6.6%	3.9%	5.4%	4.7%
World Languages	4.8%	4.5%	4.6%	3.1%	4.1%	3.8%
Computer Programming	5.6%	9.9%	8.3%	5.6%	8.0%	7.6%
Work Experience	–.–	5.0%	5.0%	–.–	3.8%	3.8%
Special Education	7.8%	11.6%	10.4%	5.9%	10.6%	8.6%
Other	0.4%	2.9%	2.3%	0.4%	1.0%	0.9%

Table 4

Percentage of Students Failing at least One Course, by Semester

SEMESTER	RACIAL/ETHNIC GROUP					DISTRICT AVERAGE
	Amer. Indian	Black	Hispanic	White	Asian	
83, Fall	24.9%	29.0%	18.2%	12.8%	3.9%	14.5%
84, Spring	27.9%	31.6%	25.1%	13.6%	3.8%	15.7%
84, Fall	27.2%	29.9%	22.8%	13.9%	5.9%	16.0%
85, Spring	33.7%	33.4%	23.6%	16.1%	5.0%	17.8%
85, Fall	32.6%	32.6%	24.1%	15.9%	5.3%	17.8%
86, Spring	31.4%	31.1%	22.5%	15.2%	6.4%	17.2%
86, Fall	29.9%	32.7%	27.0%	16.4%	5.7%	18.4%
87, Spring	37.6%	30.7%	29.5%	15.8%	5.5%	17.9%

Table 5

Percentage of Students Failing at Least One Course, by Grade[1]

GRADE	RACIAL/ETHNIC GROUP					DISTRICT AVERAGE
	Amer. Indian	Black	Hispanic	White	Asian	
7	30.7%	27.1%	18.3%	10.6%	2.2%	13.6%
8	30.4%	27.3%	21.4%	12.0%	3.3%	14.8%
9	40.0%	43.8%	34.3%	21.2%	6.1%	24.0%
10	33.3%	36.9%	26.2%	18.0%	5.4%	19.9%
11	26.5%	32.0%	26.9%	16.6%	7.2%	18.2%
12	14.2%	18.3%	17.7%	10.0%	6.5%	10.9%

[1] Data shown are eight-semester averages.

Table 6a

Reasons for Student Failure, as Reported by Teachers

REASON	GRADE						AVERAGE GR. 7-12
	7	8	9	10	11	12	
Poor attendance	50.%	59.%	65.%	66.%	66.%	64.%	62.%
Assignments not complete	77.%	81.%	75.%	74.%	74.%	70.%	75.%
Failed tests	64.%	65.%	60.%	57.%	57.%	50.%	59.%
Lack of effort	68.%	72.%	62.%	61.%	57.%	55.%	62.%
Average number of reasons reported	2.6	2.8	2.6	2.6	2.5	2.4	2.6

Table 6b

Actions Reported by Teachers to Prevent Student Failure

ACTION	GRADE						AVERAGE GR. 7-12
	7	8	9	10	11	12	
Personal conference	74.%	76.%	65.%	64.%	64.%	63.%	67.%
Phone call home	42.%	40.%	22.%	20.%	20.%	21.%	26.%
Teacher notice	66.%	67.%	70.%	67.%	66.%	64.%	67.%
Attendance referral	31.%	32.%	30.%	31.%	29.%	27.%	30.%
Average number of actions per lost credit	2.1	2.2	1.9	1.8	1.8	1.7	1.9

Table 7

Third-Party Referrals Reported by Teachers

REFERRAL	GRADE						AVERAGE GR. 7-12
	7	8	9	10	11	12	
Counselor	51.%	53.%	39.%	36.%	37.%	42.%	47.%
Assistant Principal	33.%	34.%	22.%	21.%	20.%	19.%	23.%
Attendance Specialist	14.%	16.%	11.%	9.%	10.%	10.%	11.%
Social Worker	22.%	22.%	5.%	3.%	3.%	3.%	9.%
Child Study Team (Special Ed.)	17.%	14.%	3.%	2.%	1.%	1.%	6.%
Pupil Problems Committee	13.%	16.%	<1.%	<1.%	<1.%	<1.%	5.%
Advisor/Homeroom	10.%	7.%	3.%	3.%	4.%	3.%	4.%
Principal	8.%	10.%	1.%	2.%	2.%	2.%	3.%
Nurse	8.%	8.%	2.%	1.%	1.%	2.%	3.%
Chemical Dependency Specialists	8.%	7.%	1.%	1.%	1.%	1.%	3.%
Remedial Reading	7.%	6.%	1.%	1.%	1.%	1.%	2.%
Average number of referrals per lost credit	1.9	1.9	.9	.8	.8	.8	1.2

Table 8a

Means and Standard Deviations for Credit-Deficient and Comparison Groups of those in Grade 9 in 1984-85

VARIABLE	Credit-Deficient Group		Comparison Group	
	Group Mean	Group S.D.	Group Mean	Group S.D.
% absenteeism, 1983-85	16.1%	11.0%	6.1%	5.1%
Reading test score (NCE)	53	19	40	21
Math test score (NCE)	24	21	42	22
Language test score (NCE)	36	25	52	21
Ability test score (NCE)	37	25	54	26
Black, Hispanic, or Indian[1]	.36	.48	.19	.39
Asian [1]	.03	.18	.04	.19
Gender [2]	.52	.50	.50	.50
Community income code	4.59	1.76	5.03	1.69

[1] mean indicates proportion of group falling in each of these categories

[2] mean indicates proportion of group who are male

Table 8b

Discriminant Analysis of Credit-Deficient and Comparison Groups in Grade 9 in 1984-85

Variable	Entered at step #	Standardized Coefficient	$p \leq$
83-84 absenteeism	1	.793	.0001
Language test score	2	-.353	.0001
Mathematics test score	3	-.207	.007
Minority status	4	.155	.01

Classification Results

Actual Group	Predicted Group: Credit-deficient	Predicted Group: No failures
Credit-deficient	339 (81.3%)	78 (18.7%)
No failures	65 (23.0%)	217 (77.0%)

Percent correctly classified = 79.54%

Number of cases with complete data
Credit-deficient group – 417
Comparison group – 282

Table 9a

Means and Standard Deviations for Credit-Deficient and Comparison Groups of those in Grade 9 in 1986-87

VARIABLE	Credit-Deficient Group		Comparison Group	
	Group Mean	Group S.D.	Group Mean	Group S.D.
% absenteeism, 1983-85	9.1%	7.1%	4.6%	4.4%
Reading test score (NCE)	43	22	51	23
Math test score (NCE)	24	26	44	23
Language test score (NCE)	38	23	51	23
Ability test score (NCE)	36	25	48	26
No. of credits lost in 1984-85	.795	1.50	0.0	0.0
Black, Hispanic, or Indian [1]	.42	.98	.18	.39
Asian [1]	.03	.17	.12	.32
Gender [2]	.53	.50	.49	.50
Neighborhood income code	4.57	1.71	4.81	2.01

[1] mean indicates proportion of group falling in each of these categories
[2] mean indicates proportion of group who are male

Table 9b

Discriminant Analysis of Credit-Deficient and Comparison Groups in Grade 9 in 1986-87

Variable	Entered at step #	Standardized Coefficient	$p \leq$
83-84 absenteeism	1	.393	.0001
Mathematics test score	2	-.440	.0001
Credits lost in 1984-85	3	-.263	.0001
Asian	4	-.305	.0001
Black, Hispanic, Native American	5	.223	.004
Number of school transactions	6	.214	.006

Classification Results

Actual Group	Predicted Group: Credit-deficient	Predicted Group: No failures
Credit-deficient	349 (84.5%)	64 (15.5%)
No failures	113 (45.9%)	133 (54.1%)

Percent correctly classified = 73.14%

Number of cases with complete data
Credit-deficient group – 413
Comparison group – 246

Table 10a

Means and Standard Deviations for Groups Defined by Enrollment Status in 1986-87 from those Losing Credit in Grade 9 in 1984-85

VARIABLE	Dropout Group		Students Still in School	
	Group Mean	Group S.D.	Group Mean	Group S.D.
% absenteeism, 1983-85	20.6%	12.5%	11.8%	7.6%
Reading test score (NCE)	44	21	40	21
Math test score (NCE)	28	21	20	25
Language test score (NCE)	37	23	36	21
Ability test score (NCE)	40	25	36	26
No. of credits lost in 1984-85	3.6	2.1	2.8	1.9
Black, Hispanic, or Indian[1]	.31	.47	.40	.49
Asian[1]	.00	.00	.04	.20
Gender[2]	.51	.50	.54	.50
Community income code	4.90	1.70	4.43	1.75

[1] mean indicates proportion of group falling in each of these categories

[2] mean indicates proportion of group who are male

Table 10b

Discriminant Analysis of Dropout and Continued-Enrollment Groups

Variable	Entered at step #	Standardized Coefficient	$p \leq$
83-84 absenteeism	1	.749	.0001
Number of school transactions	2	-.564	.0001
Neighborhood income code	3	.301	.004
Mathematics test score	4	.288	.008

Number of cases with complete data
Students still in school – 141
Dropouts – 91

Classification Results

Actual Group	Predicted Group: Still in school	Predicted Group: Dropped out
Still in school	186 (89.0%)	23 (11.0%)
Dropped out	75 (45.2%)	91 (54.8%)

Percent correctly classified = 73.87%

Table 11 a

Regression Analysis Predicting Credit Achieved by 1986-87 for Those Remaining in School

Variable	*B*	β	$p \leq$
Credit lost in 1986-87	-1.544	-.265	.0008
No. of school transactions	-2.348	-.241	.0022
% absenteeism 1983-85	-.260	-.181	.025
Ability test	.018	.165	.027
(Constant)	58.493		

Multiple R = .523 Multiple R^2 =.274

Standard Error = 9.375

Table 11b

Crosstabulations of 1984-85 Credit Loss With Credit Loss in Subsequent Years for Students in Grade 9 in 1984-85[a]

Credits lost in 1984-85	Credits lost in 1985-86					Credits lost in 1986-87				
	0	1	2	3	4 or more	0	1	2	3	4 or more
1	43	16	5	3	9	36	11	11	6	13
2	28	11	11	8	12	36	11	11	3	12
3	17	13	7	5	5	24	6	5	4	8
4 or more	42	15	13	11	33	70	10	9	7	21

[a] Numbers in the body of the table show the number of students still enrolled in school who fit in each category.

Table 12

Crosstabulation of 1984-85 Credit Loss With Credit Loss in 1986-87 for students in Grade 9 in 1986-87[a]

Credits lost in 1984-85	Credits lost in 1986-87			
	1	2	3	4 or more
0	69	61	58	103
1	14	22	13	26
2	2	2	10	20
3	1	3	4	10
4	5	3	5	20

FIGURE 1. Percentage of credit lost by various groups

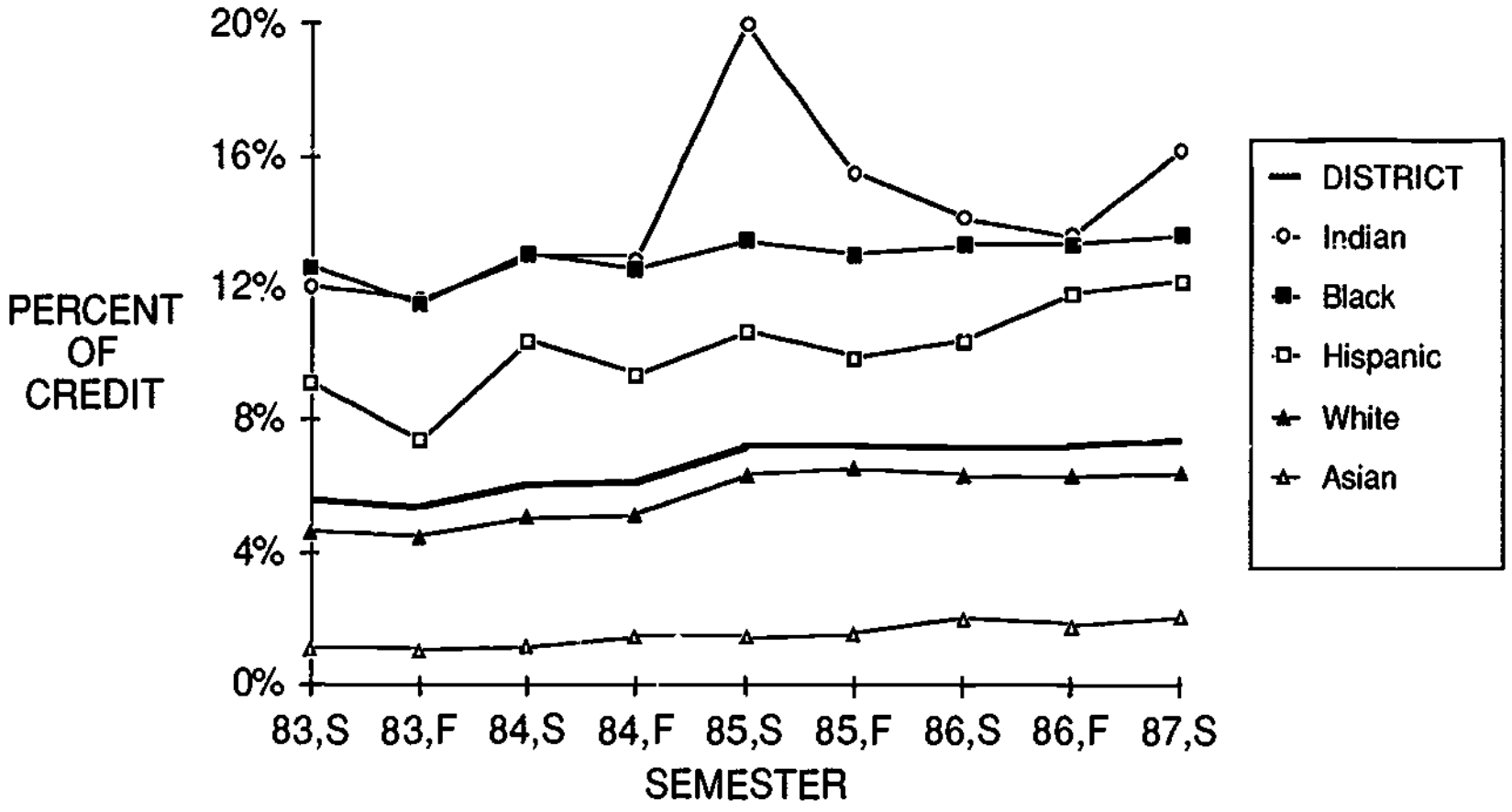

FIGURE 2. Percentage of credit lost at each grade by various groups

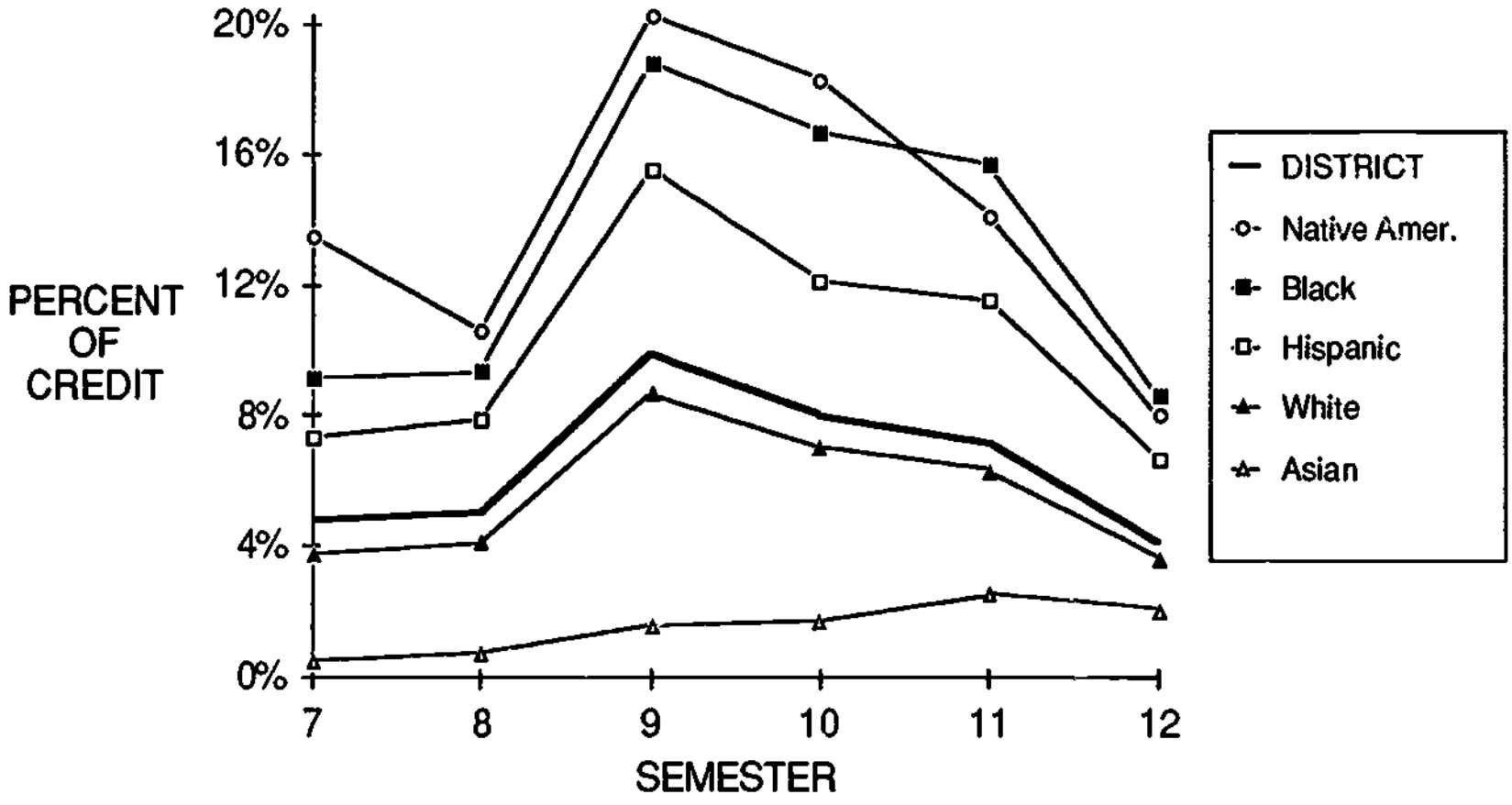

FIGURE 3. Percent of students failing at least one course – by semester

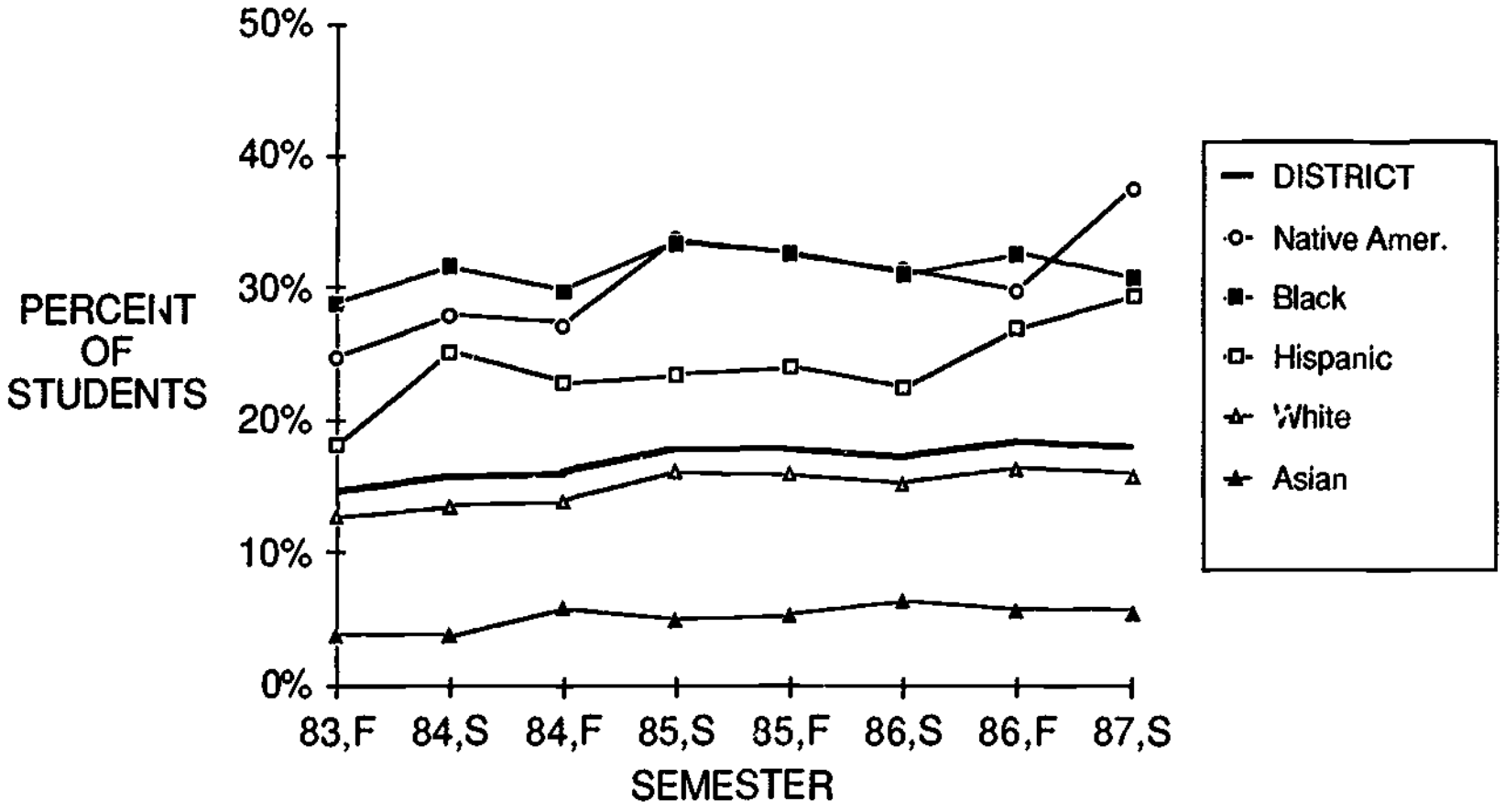

FIGURE 4. Percentages of students failing at least one course – by grade

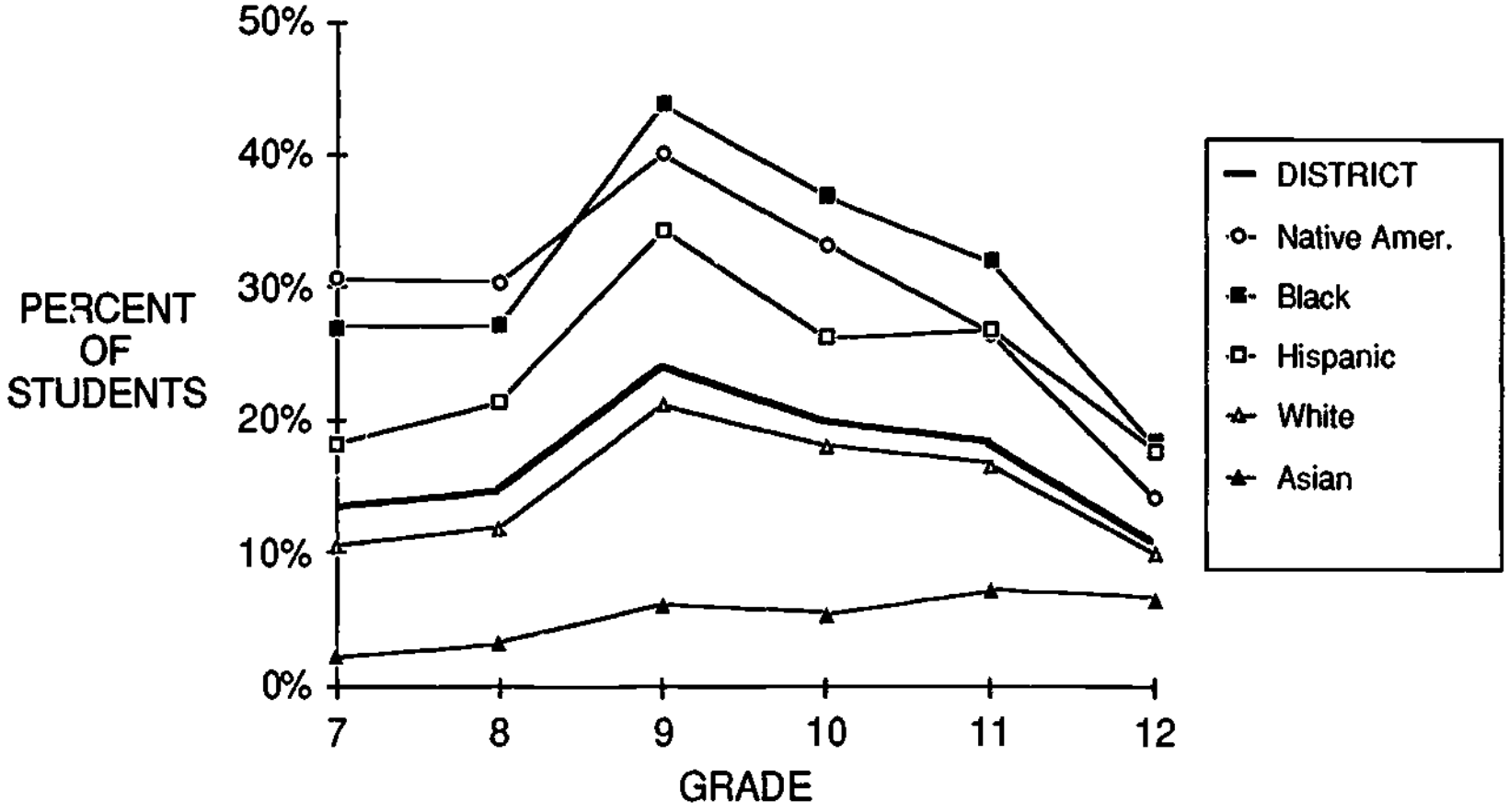

FIGURE 5. Average number of male and female students failing one or more course.

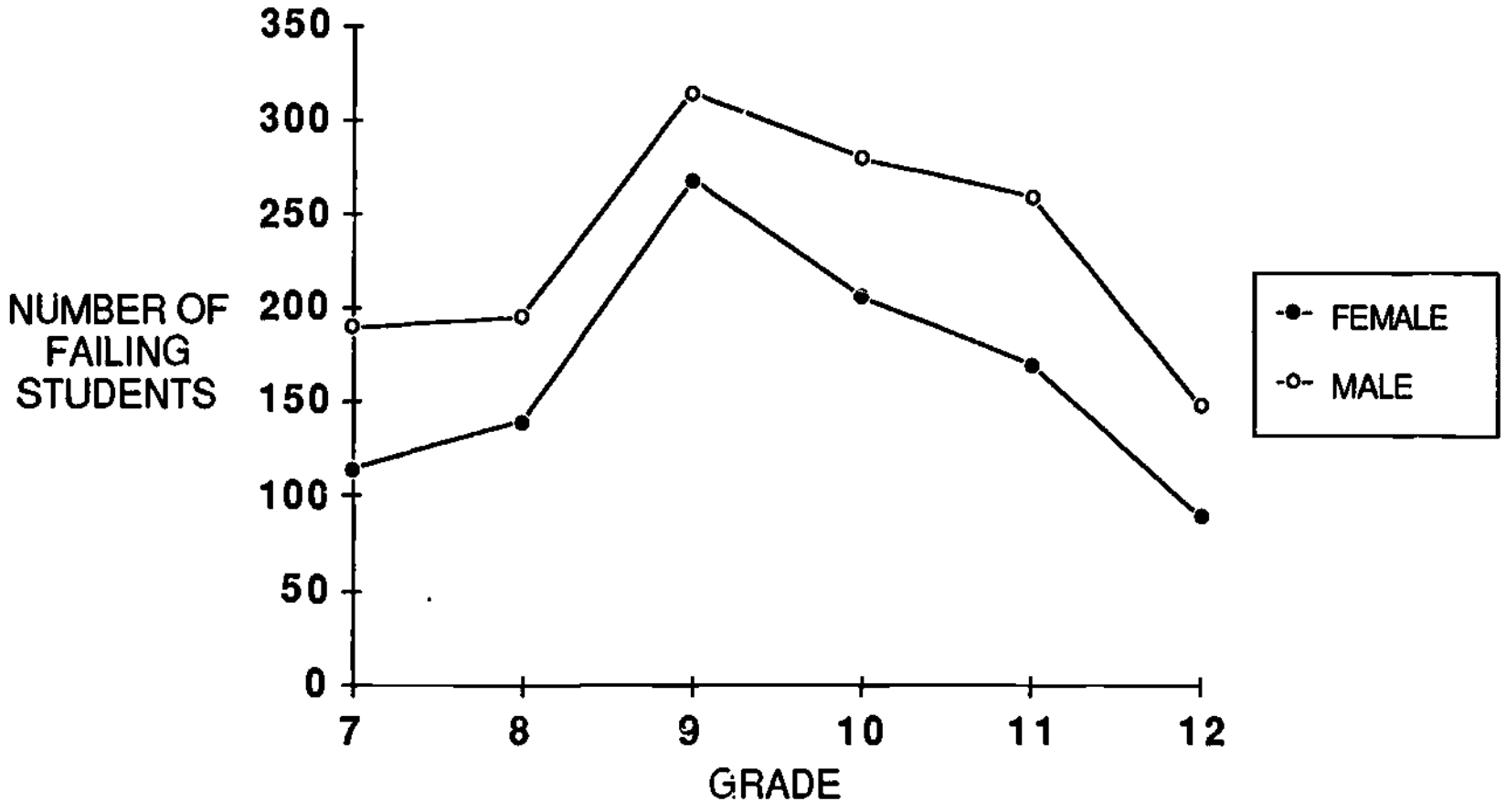

FIGURE 6. Average number of credits lost related to attendance