ACADEMIC MERIT, STATUS VARIABLES, AND STUDENTS' GRADES

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Students' grades are important mechanisms for advancement and success in life. Grades are criteria for college admission and academic awards, and they undoubtedly influence the encouragement and advice students receive regarding their future plans. In using grades in these ways it is assumed that they reflect students' actual achievement. This paper examines this assumption by looking at the extent to which ability, social class, and gender, as well as achievement, influence students' grades in school. Earlier work is extended by including both gender and social class in the analysis and by examining influences on students' grades in each year from the 7th- to the 12th-grade and both the total grade average and marks in the subject areas of mathematics and English. The total grade averages were examined because they have most often been the focus of other studies. English and mathematics grades were examined because of the centrality of these disciplines to the school curriculum and because of the association of achievement in these areas with both gender and social class.

THEORETICAL BACKGROUND: MERITOCRATIC AND STATUS PERSPECTIVES

The relative influence of merit and status on school rewards has received a fair amount of attention in the literature (Rehberg & Rosenthal, 1978; Hurn, 1978). To the extent that students' grades and other attainments reflect actual abilities and achievement, it is said that a meritocratic system exists. Most authors recognize that grades are also affected by the personal biases of the grader (Lavin, 1965) and that grades, along with other methods such as detention, are used to control or motivate students (Goslin, 1965). The extent that biases in grading are related to ascribed characteristics of students, such as their social class or gender, it is said that "status variables" influence grades.

Studies of classroom interactions support the meritocratic view by indicating that teachers respond more favorably to high achieving than to low achieving students (Hoehn, 1954; Degroat & Thompson, 1949; Horn, 1914; Jerslid, Goldman, Jerslid, & Loftus, 1941; Good, 1970; Kranz, Weber, & Fishell, 1970; Brophy & Good, 1974; Riley, 1981). Other studies indicate that scores on standardized achievement tests are positively, but moderately, associated with students' total grade averages (McCandless, Roberts, & Starnes, 1972) and with marks in English and arithmetic (Hauser, 1971), at least for students in the seventh- and eighth-grades.

Students scores on standardized ability tests have been found to have a relatively high association with assigned grades. Correlations generally range between .50 and .60 (Lavin, 1965; McCandless, et al., 1972). Studies of influences on grades in specific subject areas note a moderate correlation (from .36 to .42) between ability test scores and English and arithmetic grades (Olneck & Bills, 1980), although once academic achievement is controlled the influence of ability drops markedly (Hauser, 1971).

A relationship between social status and academic achievement has often been noted in the

literature, both in the United States and elsewhere (Boocock, 1980). Controversy exists, however, over the extent to which other variables can account for this relationship. Based on a review of a number of studies, Lavin (1965) concluded that when scores on ability tests are used as a control variable the correlation between social class and grades often declines, but does not disappear. Others conclude that social class has no direct effect on students' grade averages once students' ambition for further education (Rehberg & Rosenthal, 1978), non-cognitive traits such as industriousness (Olneck & Bills, 1980), ability test scores (Sewell & Hauser, 1976; Portes & Wilson, 1976; DiMaggio, 1982) and/or achievement test scores (Hauser, 1971) are controlled.

A number of studies indicate that females receive higher grades than males throughout all the years of school, even though males and females generally score equally well on the total scores of standardized ability and achievement tests (Fetters, 1975; Achenbach, 1970; Coleman, 1961; Monday, Hout, & Lutz, 1966-67; Davis, 1964). These differences in grades also appear in specific areas, such as mathematics, where males sometimes have higher achievement test scores (e.g., Carter, 1952; Hess, Shipman, & Bear, 1969; Brophy & Good, 1974). In contrast to their conclusions regarding social class, Rehberg and Rosenthal (1978) note that gender is a significant influence on students' grades, regardless of their educational ambition or scores on standardized tests of ability.

Hypotheses

Based on this literature review it is expected that both meritocratic and status variables would influence students' grades. However, since the meritocratic argument assumes that grades reflect the actual learning of subject matter rather than general intellectual ability, the purest support for this argument would occur if ability test scores did not influence grades once achievement had been controlled. Although researchers of the student peer subculture note that working class males are at the greatest disadvantage in school (Coleman, 1961), it is unclear if this disadvantage results from the simple effect of social class and sex or if an interaction produces even lower scores.

Because of their specificity and close association with the subject matter, the influence of subtest achievement scores on mathematics and English grades may be larger than the influence of total achievement test scores on the total grade averages. The impact of social class and sex may also vary from one subject area to another. A working class and a male disadvantage in verbal skills has often been noted in the literature (Bernstein, 1975; Maccoby & Jacklin, 1974; Stockard, 1980). In contrast, males often score higher than females on mathematics achievement tests (Maccoby & Jacklin, 1974; Stockard, 1980), and many traditional blue collar occupations such as carpentry and plumbing require as much, if not more, mathematical competency than many white collar fields. To the extent that teachers' confidence about students' achievement in these areas acts independently of their actual achievement we would expect the status variables to have a more important influence on English grades, but a smaller influence on mathematics grades (Hurn, 1978) than on the total grade average.

Although we found no studies that examine the relative influence of status and merit on grades in different years of school, we do know that teachers' expectations of students come to be based more on actual achievement than on status variables in the later years of school (Goodwin & Sanders, 1969; Williams, 1976; Sewell & Hauser, 1975). It may well be that status variables would have less of an influence on grades in the later years of school.

Methodology and Analysis

The sample included all seniors (n=570) who graduated from a high school in a middle sized, predominantly white, western city. Students certified as mentally retarded were excluded from the analysis. The subjects were equally divided between the community's two high schools, their average age was 17.6 years. Because of missing data on the measures described below, each part of the analysis included from 29% to 58% of the original group. Comparison of the grades of the analysis groups with the total sample indicated that the average grades of those in each subgroup were not significantly different from the averages of the total group.

All measures came from the students' cumulative records. The measure of ability was the total composite score on the California Test of Mental Maturity (CTMM)—Long Form (Sullivan, Clark, & Tiegs, 1964), which was administered to all students in the seventh-grade. This has been a popular group ability test because of its high correlation with the individually administered Stanford-Binet. The norms indicate no differences between the sex groups in average scores (Kaufman & Doppelt, 1976).

Yearly grade averages for grades 7 through 12 were computed from all courses in which the student received a differentiated grade, including non-academic subjects such as physical education. Average yearly grades in mathematics and English were recorded for grades 7, 8, 9, 10, and 12. All grade averages were computed on the standard 4-point-scale with an A equal to 4 points and F equal to 0.

Measures of achievement came from the Stanford Achievement Test (SAT) (1964), administered to the students in the 6th-grade, and the Iowa Test of Educational Development (ITED) (1970), administered in the 9th- and 11th-grades. Composite SAT scores were computed by averaging the scores on the subtests. Scores on two ITED subtests (reading and language arts) and three SAT subtests (word meaning, paragraphs, and spelling) were averaged to obtain measures of English achievement. The single ITED subtest score related to mathematics achievement and an average of three SAT subtest scores related to mathematics (arithmetic computations, concepts, and applications) measured mathematics achievement. The 6th-year achievement scores were used in examining grades in the 7th- and 8th-grades, the 9th-year achievement scores were used in examining grades in the 9th- and 10th-grades, and the 11th-grade achievement scores were used in examining grades in the 11th- and 12th-grades. To enhance comparability of achievement scores from one year to the next, all achievement measures were coded as percentiles.

Students were termed middle class if their father had a job within the professional-technical, managerial-administrative, clerical, or sales categories (35.6% of all fathers for whom there were data) or if their mother had a professional-technical or managerial-administrative job (24% of all the mothers who were employed outside the home). The broader category of white collar jobs was used only for the father to eliminate from the middle class group families where the father had a blue collar job and the mother worked in a clerical or sales field. Thirty-nine percent of the classified students were termed middle class; 61% were termed working class.[1]

Analysis of covariance with repeated measures (Biomed program, BMDP2V, Dixon, 1983) was used to examine the research questions, with gender and social class as the grouping variables, achievement and ability test scores as covariates, and grades in each year as the within factor or repeated measure of the dependent variable. The yearly grade averages, mathematics grades, and English grades were each examined separately. When a significant interaction appeared between the within factor and grouping variables, analysis of covariance was conducted separately for grades in each year. The analyses of the yearly grades in grades 7 and 8 and those in grades 9-12 were separated because the sample of students with data on yearly grades over all the years studied differed significantly from the total group on key measures in the analysis. No such problem appeared with the separate analyses of these years.

Certain limitations of the sample and measures should be noted. First, the data were from only one community and included only people who graduated from high school. Thus the results of the study primarily regard students who have the option of continuing their education. Because this group would be most likely to refer to their high school grades in the future, this restriction is not particularly problematic. Second, in measuring social class a dichotomous rather than a continuous scale was used. This decision was consciously made to parallel the theoretical arguments regarding teachers' expectations for working class and middle class students as discrete groups (Rist, 1970; Bowles & Gintis, 1976). Third, standardized achievement tests may not measure the skills and content on which teachers base classroom grades. On the other hand, these tests do measure actual learning of general subjects and any bias introduced by the lack of congruence should be equal across the sex and social class groups. A more pressing concern involves the lack of achievement data for grades 7, 8, 10, and 12 and our decision to use achievement scores from earlier years in analyzing influences on grades in those particular school years. Achievement scores from one year to the next were highly correlated (ranging from .65 to .89), but this source of potential error should be noted. Fourth, in comparing grades among students within a group it should be remembered that students enroll in different courses and, especially in high school, in different curricular areas or tracks, some of which may be more difficult than others. In addition, individual teachers may use different criteria in assigning grades. Thus our results reflect the average nature of grading practices

1. Of those termed middle class the classification of 76% was based on only the father's occupation, that of 14% was based on only the mother's occupation, and the categorization of 10% was based on the jobs of both the mother and father. Because of missing data 12% of the students could not be placed in a social class category.

within the school district studied. Finally, the students' scores on the achievement and ability tests were moderately collinear. The correlation coefficients between the ability test score and the composite and English achievement test scores were approximately equal to .80, indicating that almost two-thirds of the variance was held in common. Those between the ability test score and mathematics achievement scores were approximately equal to .70, indicating that about half of the variation was common. While this collinearity was not so extreme as to preclude analysis, it indicates that the regression coefficients attached to these variables can tend to be unstable and care must be taken in interpreting them.

Despite these limitations this study has unique advantages. The data cover a number of years as well as both specific subject areas and the total grade average. All data come from official school records, thus avoiding the problems inherent in self-reported achievement measures. While we have no information on the income or the educational attainment of the students' parents, the data on their status backgrounds corresponds to that which is officially available to the teachers. This might provide a better test of the relative impact of status and merit on assigned grades than data provided by other means such as student or parent surveys.

Results

The F-ratios resulting from the repeated measures analyses of covariance are presented in Table 1, with the top half of the table giving the results when grades from each year are combined and the bottom half showing the results of the repeated measures analysis. The repeated measures analyses indicated that students' grades differed significantly from one year to the next in all analyses except that of yearly grades in the 7th- and 8th-grades. Inspection of the data indicated that this generally reflected a drop in the students' grades over the years. Significant differences in achievement scores from one year to the next appeared in the analyses of English and mathematics grades. This reflected an increase in both mathematics and English achievement from the 7th- to the 9th-grade, but a slight decline in English achievement from the 9th- to the 11th-grade. A significant interaction between the repeated measures of grades and gender appeared in the analysis of yearly grades in the 9th- to 12th-grades. The results of a separate analysis of covariance for each of these years are in Table 2.

Table 1

Analysis of Covariance of Yearly, Mathematics, and English Grades as Repeated Measures by Social Class, Gender, Ability and Achievement

	Yearly Grades				Mathematics Grades		English Grades	
	7 - 8		9 - 12		7 - 10		7 - 12	
Source of Variation	F	p	F	p	F	p	F	p
a) Grouped Analysis								
Grouping Variables								
Social Class	10.03	0.002	17.74	<.001	0.48	0.489	15.58	<.001
Gender	10.58	0.001	24.18	<.001	8.25	0.004	17.54	<.001
Interaction (Class by Gender)	0	0.986	0.62	0.433	0.04	0.850	0.06	0.814
Covariates								
Ability	1.15	0.284	1.02	0.313	3.41	0.066	0.82	0.366
Achievement	35.68	<.001	93.72	<.001	56.85	<.001	55.56	<.001
Both covariates	67.21	<.001	113.11	<.001	52.43	<.001	93.62	<.001
b)Repeated Measures Analysis								
Grades	0.47	0.496	55.91	<.001	46.17	<.001	23.14	<.001
Achievement	----	----	0.14	0.708	5.66	0.018	23.89	<.001
Interactions:								
Grades by Social Class	0.06	0.805	0.77	0.511	1.19	0.313	2.16	0.071
Grades by Gender	0.35	0.554	7.23	<.001	1.11	0.345	1.49	0.204
Grades by Social Class by Gender	2.31	0.130	2.13	0.094	0.05	0.986	0.82	0.514
n	165		338		259		191	

Table 2

Analysis of Covariance of Yearly Grades, 9th - 12th Years, by Social Class, Gender, Ability, and Achievement

Source of Variation	Grade in School 9		10		11		12	
	F	p	F	p	F	p	F	p
Social Class	14.40	<.001	11.58	<.001	12.50	<.001	7.60	0.006
Gender	17.87	<.001	4.79	0.029	15.40	<.001	24.48	<.001
Interaction (Class by Gender)	0.55	0.459	0.75	0.388	0.25	0.621	0.83	0.362
Ability	2.30	0.130	0.02	0.894	1.07	0.302	0.14	0.711
Achievement	49.51	<.001	84.50	<.001	64.99	<.001	33.08	<.001
Both Covariates	87.12	<.001	105.16	<.001	70.15	<.001	48.51	<.001
n	352		352		369		369	

and in Table 2 indicate no significant effect of ability on grades except for a trend in the analysis of mathematics grades ($F=3.41$, $p=.066$). However, the regression coefficient associated with this effect was negative ($b=-.006$), indicating that once other variables were controlled, higher ability predicted lower mathematics grades. Achievement showed a consistent and strong effect on grades in each of the analyses, having the largest associated F-ratios of all the variables. The influence of achievement was strongest in the analysis of yearly grades in the 10th- and 11th-grades and in the analysis of mathematics and English grades. Social class had a significant effect on grades in all but that of mathematics grades analyses. The effect of gender was significant in all the analyses, and there was no interaction effect of gender and social class. In the analysis of mathematics grade and yearly grades in the 12th-year the effect of gender appeared to be substantially stronger than the effect of social class. The reverse was present only in the analysis of yearly grades in the 10th-grade.

Table 3 reports the average grades of students in each social class and gender group which would occur, given the results of the analyses of covariance, if the subjects had equal ability and achievement test scores. In almost all the comparisons, middle class females had the highest adjusted grade averages and working class males had the lowest. The only exceptions involved 7th-grade mathematics grades, where the adjusted mean of working class females was as high as that of the middle class females, and the 7th-grade mathematics and 12th-grade English grades, where the middle class males had adjusted means lower than those of the working class males.

Discussion

The influence of achievement test scores on grades was consistently strong, providing strong support for the meritocratic perspective that grades reflect students' achievement. In contrast, ability test scores showed little relative influence on grades, except for a slight *negative* impact on mathematics grades. While the collinearity between the achievement and ability test scores must be remembered, the very low influence of ability appeared consistently in this analysis and duplicated results reported by Hauser (1971). We doubt, then, that the findings may be dismissed as spurious. As noted earlier, this lack of any relative influence of ability on grades may be seen as providing stronger support for the meritocratic view than if ability had an effect. These findings indicate that academic achievement, rather than general ability, is reflected in grades.

Partial support was provided for the status perspective. While both students' social class and gender affected grades, the impact of these variables was not as strong as the influence of achievement. There was no significant interaction between gender and social class, indicating that the disadvantages working class males experience result from a simple additive effect of social class and gender.

As expected, females always had higher grades than males of the same social class group, even when their scores on standardized achievement and ability tests were controlled. While females' advantage in grades was expected from previous studies, this finding may be surprising to those cognizant of the vast female disadvantage in adult

Table 3

Average Grades of Students by Social Class and Gender, Adjusted by Ability and Achievement

Grades	Social Class and Gender Groups			
Yearly Grade Averages	Middle Class Males	Middle Class Females	Working Class Males	Working Class Females
7th grade	3.04	3.31	2.86	3.05
8th grade	3.11	3.27	2.86	3.10
n	35	31	49	50
9th grade	3.22	3.38	3.00	3.23
10th grade	2.89	3.06	2.75	2.83
n	68	60	114	110
11th grade	2.89	3.14	2.71	2.91
12th grade	2.88	3.24	2.77	3.02
n	71	65	122	111
Mathematics Grades				
7th grade	3.01	3.16	3.11	3.17
8th grade	2.72	2.94	2.68	2.90
9th grade	2.56	2.86	2.43	2.67
10th grade	2.28	2.45	2.23	2.36
n	52	46	86	75
English Grades				
7th grade	2.53	3.06	2.41	2.83
8th grade	3.08	3.29	2.76	2.97
9th grade	3.00	3.15	2.60	2.89
10th grade	2.74	3.01	2.27	2.58
12th grade	2.24	2.74	2.27	2.50
n	42	33	64	52

income, even when men and women have equal training and similar jobs. Men are also more likely than women to attain the highest graduate and professional degrees (Stockard & Johnson, 1980) and to attend the most prestigious colleges and universities (Lang, 1984). These discrepancies underscore the severity of sex discrimination in the labor force and in higher education. They also emphasize the need to take gender into account in studying influences on status attainment, for the process probably is different for males and females (Rehberg & Rosenthal, 1978).

Social class had a fairly strong influence on the total grade average and English grades, about equal in magnitude to the effect of sex. As noted above, the influence of social class on grades has been recently discounted (Rehberg & Rosenthal, 1978; Olneck & Bills, 1980; Sewell & Hauser, 1976). Our results suggest that the influence of social class is significant and that the cumulative effect of both gender and social class can work to the special detriment of working class males. It is possible that our results arise from the context of the community and schools studied. Social class may be a more important influence on the grades assigned to students in working class schools than in other settings.[2] On the other hand, by focusing on control variables such as industriousness and ambition,

2. While an analysis testing this association would coincide with the literature on contextual effects on school achievement (e.g., McDill & Rigsby, 1973; Alexander & Eckland, 1975), we were unable to find a test of this hypothesis in the literature.

researchers such as Rehberg and Rosenthal (1978) and Olneck and Bills (1980) may have minimized the full impact of social status on students' grades. Social class differences in ambition and industriousness found in the later years of school may result, at least in part, from class differences in earlier grading patterns. Ambition and industriousness may be as much a result, as a cause, of social class differences in grades.

There was no consistent support for our expectation that achievement would be a more important influence on grades in specific subject areas than on the yearly grades. However, the expectation that status variables would be relatively less important in influencing mathematics grades and relatively more important in influencing English grades than the total grade average was at least partially confirmed. Social class had no significant effect on mathematics grades, perhaps supporting our earlier contention that mathematics is an area in which both teachers and students perceive that class background is unimportant. On the other hand, courses in mathematics may be tracked along class lines (Schaefer & Olexa, 1971) and grading may involve largely within-class comparisons, thus minimizing the possible influence of social class in our analysis of all students. Interestingly enough, females retained an advantage in mathematics grades, supporting earlier studies (Carter, 1952; Hess, et al., 1969) that reported sex differences in mathematics grades even when females had no advantage in achievement test scores.

Contrary to our expectation, there was little indication that status variables were a less important influence on grades in the later years of school. The only significant interaction between the status variables and the repeated measures of grades involved gender and the yearly grades in the 9th- to 12th-grades. The separate yearly analyses in Table 2 indicated that gender was actually a more important influence in the 12th-grade than earlier, although the influence of social class declined slightly.

Obviously further research would help clarify and expand the results noted here. Given the different results found within subject areas, it would appear important for researchers to examine measures other than the composite grades or cumulative average. Examining the nature of influences on grades in earlier and later years of school, as well as in schools with different social class compositions, would also be informative. Other explanatory variables could be used including measures of ability gathered in each year, measures of achievement that more directly match the material covered in each course for which data were gathered, and other status variables such as race. Controlling for different courses, curriculum tracks, and teachers would also add to any study. Perhaps the most interesting and potentially useful line of future research would involve a phenomenological or interactive approach to explore the rationale behind teachers' assignments of grades and how students' behaviors influence the grading process (Keddie, 1971). Such studies could also explore the causal linkages over the school years between grades, aspirations, attitudes toward school, and ultimate educational attainment.

Finally, our results may have implications for people directly involved with students. On the one hand, our finding that achievement was consistently important in influencing students' grades can be comforting to educators. It demonstrates that merit is an important influence on the feedback given to students and on the information regarding students that is given to future employers and educational institutions. Yet, we also found significant influences of the status variables of gender and social class, even when achievement and ability were controlled. Educators might want to consider the implications of these differences for students' future ambitions and aspirations and consider ways to minimize the impact of status variables on students' future life chances. Many community colleges still have relatively open admission standards, which tend to benefit working class students who may use the 2-year college degree as an avenue for entrance into a 4-year school. Yet, the larger and more prestigious universities usually have strict grade requirements for admission and a number of schools have recently raised the levels required for admission, allowing only a small number of exceptions. Our results suggest that some students, especially working class males, may be unfairly barred from admission to these schools if grades are an important criterion of admission.

Summary

This paper examined the relative influence of merit and status related variables on the grades students receive. While achievement was consistently the most important influence, both social class and gender also influenced students' grades. These influences consistently worked to the advantage of middle class females and to the disadvantage of working class males. Thus, while our results

support the meritocratic position, they also suggest that status variables retain an important effect on students' grades.

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