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The Myth of Female Underachievement: A Reexamination of Sex Differences in Academic Underachievement

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This paper examines sex differences in academic underachievement among students who graduated from high school in a western city in 1978. According to data gathered from students' cumulative records for the 7th through 12th grades, males are much more likely than females to have total grade averages and grades in English and mathematics that are lower than would be predicted by their scores on standardized tests of ability. Although the highest achieving females often have lower average ability test scores than the highest achieving males, this results not from the underachievement of the brightest females but from the fact that females with a wide range of ability levels receive good grades and only the very brightest males receive high grades. These sex differences in underachievement appear for middle class and working class students, but often are smaller for the working class and in mathematics grades.

In recent years status attainment research has examined influences on males' and females' educational and occupational aspirations and attain-

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ment (e.g., Alexander & Eckland, 1974; Hauser, 1971; Sewall & Shah, 1967). Earlier studies often focused on academic achievement in the form of grades, and some examined sex differences in academic underachievement (Coleman, 1961; Fitzpatrick, 1978; Shaw & McCuen, 1960). This paper returns to the earlier tradition by examining sex differences in academic underachievement and compares the results with those reported in earlier studies.

PREVIOUS RESEARCH AND THEORETICAL BACKGROUND

The literature regarding sex differences in academic underachievement seems to involve two trends. One, common among educators, emphasizes the learning problems of males, especially their difficulties in reading and their negative reaction to school (e.g., Bentzen, 1966). Authors with this perspective cite research showing that high school females value achievement, especially academic excellence and general accomplishment, more highly than do high school males (Lueptow, 1975, 1980, pp. 56–57). Females also receive higher grades than males throughout grade school, high school, and college (Achenbach, 1970; Coleman, 1961; Davis, 1964; Monday, Hout, & Lutz, 1966–67). Although this might be expected in subjects sex-typed as feminine, such as English, females' superior grades also appear in subjects sex-typed as masculine, such as mathematics (Carter, 1952). Because the sexes generally score equally well on standardized achievement and intelligence tests (Kaufman & Doppelt, 1976; McCandless, Roberts, & Starnes, 1974), boys are defined as being underachievers in school more often than girls. Shaw and McCuen (1960) report that boys' underachievement first appears in the early grades.

The second trend in this literature, perhaps more common in feminist writings, emphasizes the underachievement of females (e.g., Frazier & Sadker, 1973). Shaw and McCuen (1960) and Fitzpatrick (1978) report that females' underachievement usually first appears after puberty and that females who eventually underachieve have grades equal to or superior to those of eventual achievers while in the early grades. Coleman (1961), in his study of midwestern high schools, notes that grades are especially devalued among females in the sophomore and junior years, when regular dating begins, and that the variance of females' grades is smaller than the variance of males' grades. He also reports that among students considered the best scholars by their classmates, females have lower standardized intelligence test scores than males. Coleman suggests that because among all the students in his sample, females have slightly higher ability scores, the brightest females may not be achieving to their potential.

Although students in all the schools Coleman studied accord less prestige to female scholars than to male scholars, the devaluation of female scholars is greater in middle class than working class schools. Coleman suggests

that this occurs because there is less sex role differentiation in middle class schools where males and females are expected to achieve academically and tend to date people of the same age. In the middle class schools, a high achieving female more seriously encroaches on the territory of young men who are potential dating and marital partners (Coleman, 1961, p. 258).

Although they have not directly examined academic underachievement, researchers in the status attainment tradition have compared the relative influence of social class and ability on males' and females' educational and occupational aspirations and educational attainment (Alexander & Eckland, 1974; Hauser, 1971; Sewell & Shah, 1967). They conclude that intelligence is generally more important than social status in determining male aspiration and attainment, whereas the reverse is true with females. This would suggest support for Coleman's conclusion that females are less likely than males to achieve to their potential, at least in the areas studied.

Underachievement of males and females has been theoretically linked to sex differentiation and sex inequality. Males' underachievement is often linked to students' perception of the school as feminine (Kagan, 1964) and teachers' reinforcement of feminine role behaviors in students of both sexes (Fagot & Patterson, 1969). It is suggested that males react against these feminine areas by receiving lower grades. Females' underachievement is usually linked to their anticipation of adult life and economic dependence on men. It is suggested that females try to keep their achievement within bounds that do not threaten their potential mates (e.g., Stockard, 1980).

Most of the studies cited here were published before the current feminist movement came into full bloom. The original intent of this study was to examine how males' and females' patterns of academic underachievement had altered since the publication of the earlier work. It was hypothesized that adolescent females, realizing the greater freedoms available to women, might be less likely than they were in earlier years to exhibit underachievement. In addition, because the women's movement has found its strongest support in the middle class (Freeman, 1975), the changes in adolescent females' achievement patterns might be stronger in that group. However, the majority of teachers are still women, and it is possible that the sex-typed nature of schooling has not altered. Thus, it was hypothesized that males' frequency of underachievement might still be high.

METHODOLOGY

Using the cumulative records of all seniors who graduated from high school in a middle-sized western city in 1978, researchers coded factors such as the sex of the students, the occupations of their parents, their grades in the 7th through 12th grades, and their scores on standardized group intelligence tests. Data were available from 287 males and 283 females. Students certified as mentally retarded were excluded. The subjects

were equally divided between the community's two high schools. Both high schools had students from a wide range of social backgrounds, but with a somewhat higher percentage of persons of working class origin than is found in the nation as a whole.

Measures

The measure of ability was the total composite score on the California Test of Mental Maturity (CTMM), Long Form (Sullivan, Clark, & Tiegs, 1964). As with most intelligence tests, items that differentiate between the sexes were omitted so that the norms show substantially equal total scores for females and males (Kaufman & Doppelt, 1976). All students in the district were given the test in the second, fourth, and seventh grades.

Yearly grade averages for the 7th through 12th grades and the cumulative grade point average for the 9th through 12th grades were used. These averages were computed from all courses, including nonacademic subjects, such as physical education, in which the student received a differentiated grade. In addition, the average grades in English and mathematics were available for all years but the 11th. Probably because the course was an elective, only a small and apparently nonrandom group of students were enrolled in mathematics in the 12th grade. Thus, only math grades from the 7th through 10th grades were used in the analysis. All averages were on the standard 4-point scale with an A equal to 4 points and an F equal to 0.

A dichotomous measure of social class was used. Students were classified as middle class if their father had a job in the professional-technical, managerial-administrative, clerical, or sales categories as defined by the census or if their mother had a professional-technical or managerial-administrative job. The broader category of white collar jobs was used only for the father to eliminate from the middle class group those families in which the father had a blue collar job and the mother worked in a clerical or sales field. Thirty-nine percent of the students were classified middle class; 61% were classified working class.

Analysis

To address Shaw and McCuen's (1960) and Fitzpatrick's (1978) findings regarding sex differences in the incidence and age of onset of underachievement, regression equations for the entire sample (females and males) were used to predict students' grades from their scores on the standardized ability tests (see Appendix I). Underachievement was defined as having grades that were lower than would be predicted given one's fourth and seventh grade CTMM scores. Severe underachievement was defined as receiving average grades that were more than one-half a grade point lower

than predicted. The proportion of males and females who exhibited severe underachievement and any underachievement at each grade were compared.

To address Coleman's work and the results reported in the status attainment literature, we duplicated, as much as possible, Coleman's techniques by comparing the CTMM scores of high achieving males and females with each other and with those of all males and females in the sample. Second, we divided the sample into discrete groups based on CTMM scores and compared the average grades of males and females in each category. This analysis, in a more direct way than Coleman's, compared the achievement of the brightest males and females and indicated if bright females were more likely than bright males to underachieve. Third, we regressed the males' and females' grades on their CTMM scores and their family social status and compared the resulting regression coefficients.

To examine the extent to which these sex differences appeared with middle class and working class students, the analyses were repeated with only students from each social class group. Finally, to address our concerns that the earlier works, by analyzing total grade averages, may have ignored subtle variations that would appear in sex-typed subject areas, we repeated the analyses using grades in English and mathematics. Because English and math were required of all students in the years studied, using grades from these courses also circumvented the problem of including elective courses in the total GPA. Because of sex-typed course preferences, the total GPA could involve several different courses for males and females.

Because data were missing on some of the measures, we used a slightly different subgroup of the total sample to analyze each research question. Comparisons of cumulative averages of students in these subgroups with those in the total group indicated that there were no significant differences, suggesting that the subgroups used in each analysis probably were representative of the total group.

Because the sample and the ability measure used here differed somewhat from those used in the earlier studies, the present study is not a direct replication of earlier work. Yet, the sample provided data that were at least comparable to the earlier studies and, even with the variation in the sample and measures, comparisons of the present results with the earlier findings should be informative.

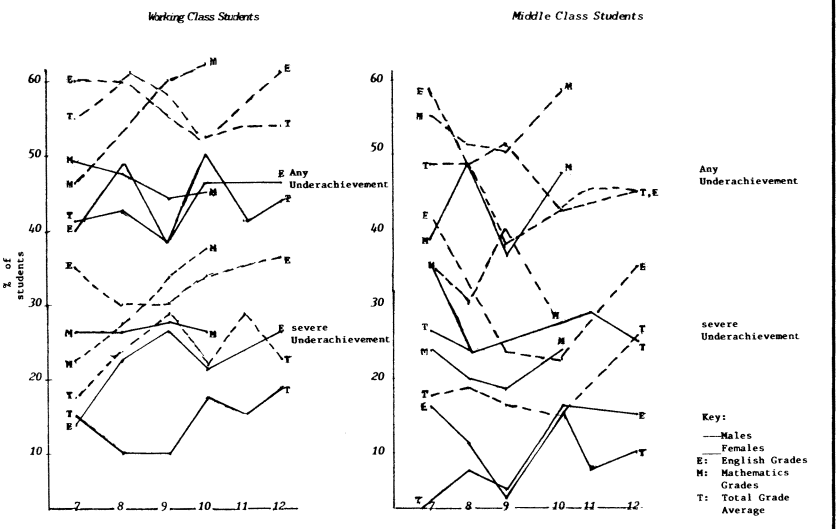
RESULTS

Two-way analysis of variance showed that, except for the 7th year math grades, where there were no sex differences, females' grades were significantly higher than males' for all the years and areas studied. Contrary to Coleman's results, F tests indicated no significant differences in the variance of males' and females' grades. Middle class students had a significant

advantage in all the averages except the 8th year total grades and 7th year mathematics grades, where no significant differences appeared. There were no significant interactions between sex and class.

Boys showed underachievement more often than girls. Of the 371 students for whom data were available, 54% of the males, but only 38% of the females, had any underachievement; and 21% of the males, but only 11% of the females, had severe underachievement in their cumulative averages. Similar differences appeared in underachievement in the yearly total grades and in marks in English and math for the total group and for students in the two social class groups. Figure 1 shows that the male and female incidence was similar in only a few cases: for middle class students, severe underachievement for the cumulative and math grades in the 10th year and any underachievement in mathematics in the 8th year; and for working class students, both severe and any underachievement in the total grades in the 10th year and in math in the 7th and 8th years. These similarities appeared to result from a relatively temporary increase in

FIGURE 1. The incidence of severe and any underachievement at each grade level by sex, social class level, subject matter.



Note. Data are included for 198 working class students and 109 middle class students.

females' incidence and/or a corresponding decrease in the incidence of males' underachievement.

There is little indication from Figure 1 that the female underachievers began to exhibit this behavior at an older age than males, except perhaps for severe underachievement in middle class students' total grades, which is nonexistent for females at the 7th grade. The incidence of female underachievement often increased somewhat at 10th grade, but except for severe underachievement in the cumulative and English grades of working class females and any underachievement in middle class students' English grades, this increase was only temporary. In all other cases the changes in the incidence of females' underachievement from one year to the next were moderate or slight, and in no case did the females' incidence increase and remain at the level shown by the males.

By duplicating Coleman's methodology, it appears that females with high cumulative and total yearly grade averages had lower average ability scores than males with similarly high grades. Within the total group, the ability scores of females were slightly higher than males' scores. These results parallel those reported by Coleman. Similar results also occurred in each social class group with the total GPA, but in substantially fewer years with the English and mathematics grades.

Table I examines Coleman's contention that differences like those he found resulted from some of the brightest females holding down their

TABLE I

Cumulative (9–12) Grade Averages of Males and Females by 7th Grade CTMM Scores and Social Class

	Working class students				Middle class students			
	Males		Females		Males		Females	
	$\bar{X}$	(*s*)	$\bar{X}$	(*s*)	$\bar{X}$	(*s*)	$\bar{X}$	(*s*)
1st quartile	2.45	(.45)	2.58	(.46)	2.77	(.40)	2.86	(.40)
2nd quartile	2.59	(.56)	2.83	(.46)	2.74	(.44)	2.93	(.46)
6th decile	2.49	(.50)	2.95	(.38)	2.93	(.58)	3.22	(.44)
7th decile	2.81	(.42)	3.08	(.65)	3.13	(.12)	3.25	(.54)
8th decile	2.81	(.51)	3.07	(.63)	3.20	(.47)	3.33	(.39)
9th decile	3.30	(.43)	3.25	(.61)	3.35	(.39)	3.61	(.30)
10th decile	3.36	(.44)	3.51	(.40)	3.17	(.80)	3.70	(.18)
Total	2.70	(.56)	2.91	(.51)	2.98	(.53)	3.24	(.49)
n	129		115		74		69	
r^2	.22		.22		.13		.36	
eta^2	.28		.23		.16		.38	

Note. The difference between r^2 and eta^2 for working class males is significant at the .05 level ($F = 2.340$; $df = 5,122$).

achievement. Contrary to Coleman's expectation, within each social class group, among the students with ability scores in the highest decile, females had much higher grade averages than males. Similar results occurred in all the areas studied: with grades in each year, within each social class group, and with the total grade average and English and math grades. The sex differences were most pronounced in the middle class group and with English grades. The correlation between ability test scores and grades was higher for females than males, indicating that females were more likely than males to receive grades concordant with their ability. This sex difference was usually more pronounced with results for the middle class students and English and total grade averages. The differences in CTMM scores similar to those Coleman reported appeared to result not from some of the brightest females holding down their achievement, but from females with a broad range of ability scores and males with a smaller range earning high grades. When differences like those Coleman reported did not appear, the correlation between females' grades and ability test scores was usually much higher than the corresponding correlation for males. Here the brightest females still had higher grades than the brightest males, and the tendency for females to receive grades commensurate with their ability was usually even greater than in the other analyses.

Table II examines the relative influence of 7th grade ability scores and socioeconomic status on males' and females' grades and supports the results reported in Table I. Contrary to the status attainment literature regarding educational and occupational aspirations and attainments, ability

TABLE II

Standardized Regression Coefficients from the Regression of Mathematics, English, and Total Grade Averages on Ability Test Scores and Social Class by Sex and Year

Year		English grades		Mathematics grades		Total grade average	
		Males	Females	Males	Females	Males	Females
12	Class	.07	.07	—	—	.09	.14
	Ability	.25	.46	—	—	.34	.42
11	Class	—	—	—	—	.11	.14
	Ability	—	—	—	—	.34	.45
10	Class	.08	.07	.03	.05	.09	.07
	Ability	.06	.46	.36	.18	.42	.57
9	Class	.14	.04	.14	.02	.15	.09
	Ability	.23	.53	.32	.35	.45	.52
8	Class	.17	.12	.08	.02	.11	.09
	Ability	.40	.49	.38	.34	.52	.57
7	Class	.03	.01	.01	.06	.14	.13
	Ability	.52	.60	.35	.45	.56	.59

was a more important influence on females' than on males' grades in all analyses except those involving 8th and 10th year math grades. The influence of SES generally differed little from one sex group to the other and, except for the analysis involving males' 10th year English grades, was always less than the influence of ability.

The sex differences in underachievement varied from one class group to the other in a direction other than that which Coleman's work would lead one to expect, but which might support our hypotheses. Middle class females were the least likely of all the groups to exhibit underachievement, and among students with ability scores in the highest deciles the females' grade advantage was greater among middle class students than among working class students. In fact, among these highest ability students, middle class males had lower average grades and a larger standard deviation than students in any other sex and social class group, and middle class females had the highest grades and smallest standard deviation of the four groups. These results occurred in virtually all the comparisons studied. The correlation between ability scores and the total grade average was also much larger with the middle class females than with any other sex and social class group for all the years studied, indicating that they were most likely to achieve to their potential.

The results with the math grades differed somewhat from those with the other grades. Even though females almost always exhibited less underachievement than males in this area, they were, with the exception of any underachievement among working class females, more likely to underachieve in mathematics than in English or the total grade average. This is especially noticeable with middle class students (see Figure 1). However, there was no apparent tendency for females in either class group to increase their incidence of math underachievement steadily over time, even though there was such a trend among working class males. The differences Coleman reported occurred less frequently with the math grades, even though the females with the highest ability scores retained their grade advantage over the comparable males. The only times that females had a low correlation between CTMM scores and grades were in the analyses of math grades. In the 10th year the correlation between ability and grades was lower for females in both social class groups than for the comparable males.

DISCUSSION

The results appear to suggest that the problem of female academic underachievement may be more mythical than factual. When either total grade averages or grades in the sex-typed, required courses of English and mathematics are considered, males have a much higher incidence of underachievement and there is little indication that females' incidence increases sharply with age. There is no support for Coleman's contention

that some of the brightest females are holding back their academic achievement. In contrast to results in studies of educational and occupational aspirations and educational attainment, ability appears to be a more important influence than social class on females' and males' grades. Middle class females appear to be most likely to receive grades commensurate with their measured ability, although this tendency is sometimes less prominent with mathematics than with the total grade average or marks in English.

These results indirectly support studies that have noted males' reaction against the feminine environment of school (Fagot & Patterson, 1969; Kagan, 1964) and studies that emphasize the need for special incentives to promote males' achievement (Lueptow, 1980; McClelland, Atkinson, Clark, & Lowell, 1953). The findings regarding females' lower rate of underachievement also support studies that have noted that women value achievement more highly than men (Lueptow, 1980), are motivated to achieve "in activities that are culturally defined as feminine" (Stein & Bailey, 1975, p. 153), and do not show a "motive to avoid success" in areas that are acceptable for women to enter (Condry & Dyer, 1976). Getting good grades may be acceptable feminine behavior and a safe area for women to act on their achievement-oriented values. Thus educators' concerns about males' reaction to school seem well founded. At least where grades are involved, males' performance does not seem to match measured ability.

As originally hypothesized, the striking patterns of female achievement, especially in the middle class, may reflect their response to growing opportunities resulting from the feminist movement; males' underachievement may represent their continuing pattern of rejecting the feminine school environment. However, only a more extensive analysis of earlier data can determine whether these results represent a change from earlier times, because when Coleman's methodology was duplicated, results similar to his were often found. Without the extended analysis one could well conclude as Coleman did, that these differences reflected female underachievement. Although it can only be speculated whether a more extensive analysis of Coleman's data would result in findings similar to ours, there is evidence that sex differences in life goals, occupational values, and achievement orientations of adolescents were the same in 1975 as in 1964 (Lueptow, 1980). If these orientations changed little from the late 1950s to 1964 it could be hypothesized that the differences Coleman found also resulted from patterns of high female achievement rather than from female underachievement.

The finding that the influence of ability scores on grades is usually higher for females than for males is in contrast to results from studies of educational and occupational aspirations and educational attainment, which note that females are much less likely than males to achieve at their

expected levels in these areas. One of these studies (Alexander & Eckland, 1974, p. 679) gives results of a regression analysis, and another (Hauser, 1971, p. 110) includes zero-order correlations, which were used to compute regressions of grades on ability and social class for each sex group. The results from both studies are similar to ours, with ability being a more important influence than social class for both females and males. This suggests that achievement, as measured by grades, must be seen as distinct from achievement measured by educational and occupational aspirations and attainment, and supports the contention that school achievement may well be perceived as an area where it is appropriate for females to excel. These results could also suggest that the cause of feminism could benefit more from attention to the vast inequities the majority of women face in the adult occupational world than from attention to the relatively few and generally mild cases of female academic underachievement. A central question might well be why women's academic success does not transfer into the adult occupational world, an issue that is touched upon by some writers in the status attainment field (e.g., Alexander & Eckland, 1974, p. 680).

The class differences reported here also deserve special comment. As hypothesized, the exceptionally high achievement of middle class females may reflect the middle class focus of much of the ideology of the feminist movement, although further research would be needed to examine this contention. The highest rates of underachievement and lower grades of working class males, even when ability is controlled, may support work such as that by Coleman (1961), which notes the special estrangement of working class males from school and their tendency to find fulfillment in nonschool activities. However, the low average grades of middle class males in the highest ability decile were unexpected. The large standard deviation indicates that some bright middle class males are not holding down their achievement, but this pattern should be examined in other settings.

There is some indication that females' superior achievement patterns are not quite as strong in mathematics, a traditionally male-typed area, as in English, a traditionally female area, or in the total grade averages. This may indicate that the sex-typed nature of a subject may affect the extent of females' advantage in academic achievement and that when a subject is culturally defined as appropriate for males, they will be less likely to avoid achievement in that area.

Finally, further work may help in understanding the areas discussed here. One important project would be applying the analyses used here to data from earlier years. It could also be important to look at underachievement in specific courses, to determine other variables that influence variations in underachievement, and to examine the long-range implica-

tions of adolescent underachievement, especially its relation to educational and occupational attainment.

SUMMARY

This paper examines underachievement among students who graduated from high school in 1978 in a western city. It is suggested that the problem of females' academic underachievement may be more mythical than factual, because underachievement is found to be much more common among males than females. The sex differences in the incidence of underachievement occur at each grade level studied, with middle class and working class students, and with the total grade averages and with grades in English and mathematics. There is no indication that females' underachievement appears at a later age than males' underachievement.

Coleman (1961) suggests that sex differences in ability test scores of high achieving students result from some of the females with the highest potential hiding their abilities by not getting grades as high as equally bright males. Although difference scores similar to those Coleman reports occur in the present study, further analyses indicate that these differences result more from the high achievement of only the brightest males than from the underachievement of bright females. These results appear with both middle class and working class students, and with both the total grade average and English and math grades. The sex differences appear to be strongest with English grades and the total grade average and with middle class students rather than working class students.

APPENDIX I

Regression Equations and Associated R^2

CUM GPA = .700 + .008 7th CTMM**	+ .013 4th CTMM,***	R^2 = .27***
12th GPA = .744 + .008 7th CTMM*	+ .012 4th CTMM,**	R^2 = .19***
11th GPA = .647 + .006 7th CTMM	+ .016 4th CTMM,***	R^2 = .20***
10th GPA = .483 + .012 7th CTMM***	+ .011 4th CTMM,**	R^2 = .26***
9th GPA = .929 + .009 7th CTMM**	+ .012 4th CTMM,***	R^2 = .28***
8th GPA = .384 + .010 7th CTMM***	+ .016 4th CTMM,***	R^2 = .34***
7th GPA = .302 + .012 7th CTMM***	+ .013 4th CTMM,***	R^2 = .39***

*$p < .05$; **$p < .01$; ***$p < .001$.

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