EDUCATION AND GENDER EQUALITY:
A CRITICAL VIEW

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A number of authors have discussed how educational experiences influence gender inequality. To combat these influences the popular media and educators encourage women and girls to pursue advanced training if they want to "get ahead," often stressing the importance of training in mathematics. Educators design courses to help women overcome "math anxiety" and to encourage promising young girls to pursue mathematics training. Likewise, girls are encouraged to enter nontraditional vocations; and counselors and teachers, as well as parents, are reminded to encourage young women to enter fields typically seen as appropriate for men. Researchers urge teachers and counselors to monitor their interactions with male and female students so that males are not favored over females. Writers of textbooks and tests are encouraged to use equal numbers of

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examples about males and females, to picture members of both groups in equal numbers, and to avoid sex-typed descriptions of activities.

Much of this advice appears to be based on the assumption that if women gain more education, train in typically male areas, increase their mathematical skills, are properly encouraged by adult role models, and/or are exposed to nongender-biased curricula, then gender inequality in the adult occupational world should lessen. The evidence to support this assumption, however, appears to be minimal. Each of these modifications may be laudable in and of itself, and each may produce some level of change. Nevertheless, I will show in what follows that the evidence suggests that it would be unreasonable to expect alterations in these areas of education to change segregation of males and females in the occupational world or to lessen the gender gap in income in any marked way. In other words, the linkage between gender differences in educational experiences and gender inequalities in the adult occupational world is probably much more tenuous than commonly believed.

In this paper I first briefly review literature typical of that on gender inequalities in education. Then I examine the research evidence regarding gender differences in academic achievement, attention received in school, educational attainment, and areas of study, and discuss how these differences are related to gender inequalities in occupational status and income in adulthood. Finally, I relate this discussion to theoretical explanations of the persistence of male dominance and explore the implications of the analysis. Because most of the arguments regarding the relation between education and gender inequality have dealt with the United States, the discussion will generally deal only with this country. In addition, it will not involve differences in educational and occupational experiences of men and women in various racial-ethnic groups (see Stockard, 1980; Almquist, 1984 for discussions of aspects of this issue), for the thesis of this paper probably applies to all such groups in this country.

GENDER INEQUALITIES AND EDUCATION IN THE LITERATURE

In the literature, many analyses of gender inequality refer to education. Three examples provide illustrations of this general theme (Lipman-Blumen, 1984; Richardson, 1981; Weitzman, 1984). These authors and others imply that much of the gender inequality in the adult world can be related to stereotyped views of men's and women's adult roles. Students' experiences in school are seen as an important element in shaping their

aspirations for these roles. For instance, in discussing sex-role learning, Lenore Weitzman (1984:184) notes that "once the child enters school, her or his experiences there assume great importance." Weitzman goes on to note the presence of sex stereotypes in reading and test materials as well as the influence of teachers and guidance counselors in maintaining sex stereotypes and influencing girl's aspirations.

Jean Lipman-Blumen (1984:152) notes that "through the centuries the educational system has maintained gender-role segregation." Differential participation of women and men in higher education is cited by both Lipman-Blumen (1984:143-144) and Richardson (1981:76-77). They also note that subject areas in colleges are highly sex segregated. Notably enough, the areas in which males usually major tend to lead to higher paying jobs than the areas in which females major. All three authors see educational experiences as directly influencing students' career choices and thus women's predominance in lower paying occupations (see Lipman-Blumen, 1984:142-149; Richardson, 1981:61-62; Weitzman, 1984:184-186).

Some of the comments focus on women's underachievement (Weitzman, 1984:187-189, 194-202; Richardson, 1981:71-73) and their "motive to avoid success" (Weitzman, 1984:202-204; Lipman-Blumen, 1984:145-148). Special attention is often given to mathematics (see Lipman-Blumen, 1984:141-142; Weitzman, 1984:210-215; Richardson, 1981:73-76). Various ways of diminishing gender differences in mathematics achievement are proposed by these and other authors including encouragement of potential students (e.g., Fox, 1970), treatment of "math anxiety" (Tobias, 1978), and even biofeedback training to encourage girls to solve mathematical problems in different and potentially more productive ways (Rossi, 1984:14). All of these discussions assume that the gender difference in mathematics achievement is marked and is related to differences in males' and females' achievement in the adult occupational world (see also Sells, 1978).

Probably none of these authors would assert that changes in education would be sufficient to end gender inequality in the adult occupational world. Yet, by stressing the supposed inferiorities of women in academic achievement and educational attainment, as well as sex-typed interactions in the schools, they imply that education is an important contributor to the overall condition of gender inequality. If this were the case, we would expect gender differences in academic achievement, especially in mathematics, to be marked. We would also expect to find evidence of at least some linkages between sex-typed classroom interactions and materials and gender inequalities in later life as well as a connection between educational attainment and areas of study and adult occupational success. In what follows, I attempt to show that these linkages are minimal.

GENDER DIFFERENCES IN ACADEMIC ACHIEVEMENT

Studies of gender differences in academic achievement have involved learning disabilities, grades, scores on achievement tests—especially in mathematics—and underachievement. Interestingly enough, many of the gender differences which occur in academic achievement involve advantages which accrue to females rather than to males.

Grades, Behavior and Learning Problems, and Achievement

Females receive higher grades than males throughout school, from the elementary years through college (Lavin, 1965; Davis, 1964). This advantage appears in total grade averages and in specific subject areas such as English and mathematics (deWolf, 1981) and despite the fact that males and females usually score equally well on composite tests of achievement (McCandless, et al., 1974; Stockard, et al., 1985).

In addition, girls appear more likely to be well adjusted to school. Males suffer various learning disabilities, exhibit more behavior problems, are referred more often for remedial work, and in general, are rated lower than females on many dimensions of behavior by teachers and other adults. Only a small part of this discrepancy can be explained by a tendency to underreport girls' problems (Barfield, 1976; Cruickshank, 1977; Blom, 1971). Both official records and self-reports show that males commit various kinds of illegal activities more often than females (Feyerherm, 1981; Schur, 1984:213-220). High school girls also report spending much more time doing homework, report greater participation in extracurricular activities of all types (except sports) more often than boys (Grant and Eiden, 1982:71-72), value academic achievement more highly than boys (Lueptow, 1975, 1980) and report "liking" school more than boys (Sexton, 1969).

Nevertheless, some gender differences exist in the areas in which students achieve. Table 1 summarizes results obtained from the National Assessment of Educational Progress (NAEP), a set of achievement tests given to a nationally representative sample of students from 1975 to 1980. Results on these tests support many studies which show that from the first years of school and continuing through adulthood, girls score higher than boys on various tests of verbal reasoning and achievement (e.g., Maccoby and Jacklin, 1974; Herman, 1975). Beginning around adolescence, boys score higher on tests of mathematics achievement, especially those involving spatial-visual skills, a special kind of perceptual ability (Aiken, 1976; Fennema, 1974; Maccoby and Jacklin, 1974).

Table 1. Differences in the Percentage of Correct Answers of Males and Females on the National Assessment of Educational Progress by Subject Area and Age[1]

	Age		
Subject Areas	*9*	*13*	*17*
Reading/literature comprehension (1979–80)	5.0	4.1	2.8
Music (1978–79)	1.9	2.4	3.5
Art (1978–79)	−0.4	1.8	2.5
Citizenship (1975–76)	−0.6	0.2	0.0
Social studies (1975–76)	−0.6	0.0	−0.4
Science (1976–77)	−3.1	−3.5	−5.1
Mathematics (1977–78)	0.4	0.6	−2.5

[1]Negative signs indicate an advantage for males. Dates in parentheses indicate the year the test was given

Source: Grant and Eiden, 1982:25–27

Mathematics Achievement

As noted, much of the commentary on gender differences in achievement has focused on mathematics. Researchers suggest that mathematics is a crucial filtering device, serving to sort out students who are eligible for studying lucrative, male-dominated fields such as engineering, architecture, or computer science (Ernest, 1976; Sells, 1978). Some authors focus on math anxiety, "feelings of tension and anxiety that interfere with... the solving of mathematical problems" (Richardson and Suinn, 1972:551). It is suggested that women experience math anxiety more often than men and that this helps prevent women from achieving their full potential (Tobias, 1978; Betz, 1978). Special coursework, counseling, and other training procedures are advocated to cure this anxiety. Yet, not all analyses of the actual prevalence of math anxiety indicate that gender differences exist (Resnick, et al., 1982), and the severity of this problem has not been fully documented.

Just as gender differences in math anxiety may be small, gender differences in mathematics achievement are also small. For instance, the gender differences in 17-year-old students mathematics NAEP test scores are smaller than the differences in reading, music, or science. In addition, the variation in NAEP scores (in all subject areas) by region of the country, race, parental education, or size and type of community is larger, often by many times, than the variations by sex (Grant and Eiden, 1982:20-27).

Gender differences in mathematics achievement are also small when compared to gender differences in adult income. For instance, the average

mathematics SAT scores of females is approximately 90% of the average score of males (computed from 1980-81 data, CEEB, 1981), and the median mathematics NAEP score for 17-year-old females is 96% that of 17-year-old males. In contrast, the median income of all women full-time, year-round workers in 1982 was about three-fifths of that of all full-time, year-round men workers. These figures suggest that equalizing men's and women's mathematics achievement is insufficient to end gender inequality in overall income.

Moreover, simply increasing women's mathematical achievement would not necessarily alter the sex segregation of occupations. Forty-two percent of all bachelor's degree recipients in mathematics in 1979-1980 were women, a figure close to the proportion of women bachelor degree recipients in the biological and the social sciences (see Table 4). Women receive a much smaller share of the degrees in fields where one is expected to apply mathematics, such as economics, chemistry, physics, and computer science. This discrepancy may reflect differential abilities of males and females to apply mathematical knowledge, rather than to learn mathematical concepts. Yet, it might also reflect women's avoidance of occupational areas which are perceived as inappropriate for females. For example, mathematics may be seen as an appropriate major for women in undergraduate school, for it can lead to a career in teaching, a traditionally female-typed field of work and the traditional career choice of the majority of women who major in mathematics in college (Handley and Hickson, 1978). Fewer options may be perceived as available for women majoring in areas such as chemistry, physics, economics, or computer science. If this suggestion is true, gender differences in mathematics achievement may not be as much of a bar to equality in the occupational world as women's perceptions of opportunities for employment.

Underachievement

Even though gender differences in academic achievement may be relatively small, it is still possible, as some authors have suggested, that women downplay their abilities and underachieve more often than men, especially beginning in the high school years. This appears to involve two separate areas: academic underachievement, receiving grades which are lower than would be expected given one's scores on ability tests (Coleman, 1961; Shaw and McCuen, 1960; Fitzpatrick, 1978) and a more general, social avoidance of achievement which might offend males whom females wish to attract as potential partners (e.g., Komarovsky, 1953; Weitzman, 1984). The latter is said to involve behavior patterns such as "hiding one's intelligence" and not appearing superior to a male partner.

Recent analyses have suggested that the conclusions about academic underachievement could have been erroneous and that at least Coleman's (1961) conclusions were based on a potentially incomplete analysis of the data. Academic underachievement (in total grade averages, as well as in English and mathematics) appears to be more common among males than females. Boys consistently have grades lower than would be predicted by their ability (Stockard and Wood, 1984). The often-cited work on women's "motive-to-avoid success" (Horner, 1970) has also been discounted. Numerous replications have led to the suggestion that this phenomenon may appear among men as well as women and that it probably involves a reflection of social reality, including reactions of others to achievement patterns, more than a deep-seated fear of achievement (Tresemer, 1977; Condry and Dyer, 1976).

Even though females may not receive grades lower than would be predicted by their ability and females may not have a generalized "motive-to-avoid success," they may still downplay their achievements when interacting with males whom they see as potential dating or marital partners. Komarovsky (1953) first documented this pattern and others have noted its continuing presence (e.g., Frazier and Sadker, 1973:127), although some suggest the pattern may have altered in recent years (Weitzman, 1984). Whatever the current prevalence of this behavior, it probably reflects anticipated sex-roles within the family and the desire of young women to attract a spouse (see Stockard and Johnson, 1980:256-259). Its relation to policies or programs of schools is unclear.

ATTENTION GIVEN TO MALES AND FEMALES

While the formal obligation of schools is to instruct students in academic areas such as mathematics and English, much of the learning which takes place involves informal interactions or what social scientists have called the "hidden curriculum" (Jackson, 1968). When examining gender differences in this hidden curriculum researchers have looked at subtle messages about gender roles given in texts and examination questions, and at interactions between teachers and students, suggesting that gender inequalitites in these areas help promote gender inequalities in the adult occupational world.

Curricular Materials

Many studies have noted an overrepresentation of males as characters in stories, in pictures, and even as the focus for examination questions in curricular materials. Such bias has been documented in a wide range of subjects (Weitzman and Rizzo, 1974; Saario, et al., 1973). As noted above,

it is suggested that these stereotypes in the curricular material help influence girls' choices of occupations and generally reinforce students' views of sex-stereotyped roles and thus their career aspirations.

Males' overrepresentation in curricular materials probably reflects to some extent the greater valuation of males within our society as a whole. Extensive analyses of language usage, religious practices, and the mass media document the greater attention and value given to males and their activities, not unlike the emphasis found on male activities in school textbooks and tests (see Stockard and Johnson, 1980:4-10; Schur, 1984:34-37). While altering curricular materials may have a short-term effect on older students' views of occupations which are potential choices (Vincenzi, 1977) and on preschool children's sex-role stereotypes (Koblinsky and Sugawara, 1984), consistent results with such attempts to alter curriculum have not yet been demonstrated (e.g., Weeks and Porter, 1983). Given the negative portrayal of women in all media, it would be very difficult to isolate the impact of curricular material on students' adult lives from influences of other areas of society (Moulton, et al., 1978).

In addition, if employers are not willing to hire women in non-traditional occupations, encouraging women to aspire to such fields through curricular materials is an indirect way to promote change in these occupations. Some in the counseling profession note that it may also involve a potential misrepresentation of the nature of the job world to young people (Overs, 1975; Birk, et al., 1979). Finally, if women perceive that they will continue to face the predominant responsibilities of caring for their home and family during their adult lives, a situation which currently appears to be true (e.g., Pleck, 1977; also Stockard and Johnson, 1980:51-59), urging them to also add the burden of a career to this load may not be a productive means of change.

Interactions with Students

A number of studies have also noted differences in the amount and type of attention which teachers give to boys and girls. Interestingly enough, this appears to involve both more positive and more negative sanctions to boys. Among very young students boys appear to receive more loud reprimands than girls and more responses when they exhibit aggressive behaviors. They also receive more nurturant and instructional attention while behaving appropriately (Serbin, et al., 1973). Studies of elementary school children suggest that boys are criticized and reprimanded more often than girls (Jackson and Lahaderne, 1967; Dweck, et al., 1978), especially if they are underachievers or have behavior problems (Martin, 1972), but that boys also receive more academic attention and praise (Meyer and Thompson,

1963). A study of interactions in high school geometry classes provides similar evidence (Becker, 1981).

Some authors speculate that these differences in interaction patterns help reinforce girls' conformity to traditional feminine roles (Weitzman, 1984:186) and boys' greater independence and autonomy (Sears and Feldman, 1966) as well as their greater mathematics achievement (Becker, 1981). In addition, Dweck and associates (1978) suggest that boys' extensive experience with negative feedback contributes to their tendency to discount negative evaluations and to a more resilient sense of self-confidence. There is, however, little empirical evidence that males are actually more independent or autonomous than females, or that they have more positive self-concepts or higher self-esteem (See Maccoby and Jacklin, 1974), or that they have substantially greater mathematics achievement (see prior discussion). In addition, girls' reluctance to pursue careers and their conformity to traditional roles may result more from the difficulty of actually pursuing active careers while carrying the double burden of home and work responsibilities, than from the influence of interactional patterns in school.

While the greater attention teachers give to boys probably reflects, to at least some extent, the greater cultural valuation placed on males and their activities, it could also be an attempt, perhaps unconscious, to motivate students perceived as unwilling to learn. Teachers' interactions with boys in the classroom also reflect a need to control them. While it is obvious that most of the negative interactions involve reprimands and attempts at control, many of the positive interactions could also have this theme, given the current emphasis on positive reinforcement as a means of behavior management. Because the girls misbehave less often and value academic achievement more (see prior discussion), they require fewer such interactions (Jackson and Lahaderne, 1967; Serbin, et al., 1973; Kedar-Voivadas, 1983).

In general, there may be logical problems in linking the hidden curriculum to gender inequality in adult life. While there may be an as yet undocumented more direct negative effect, at this time it appears that any effect that negative portrayals and interactions may have on adult gender inequality is undoubtedly subtle and not immediate.

EDUCATIONAL ATTAINMENT

When people apply for jobs employers usually do not assess their knowledge of particular subject areas. Instead, they are often interested in how much schooling an applicant has received. In general, although there

are historical variations, females and males within the same social class group have quite similar patterns of educational attainment.

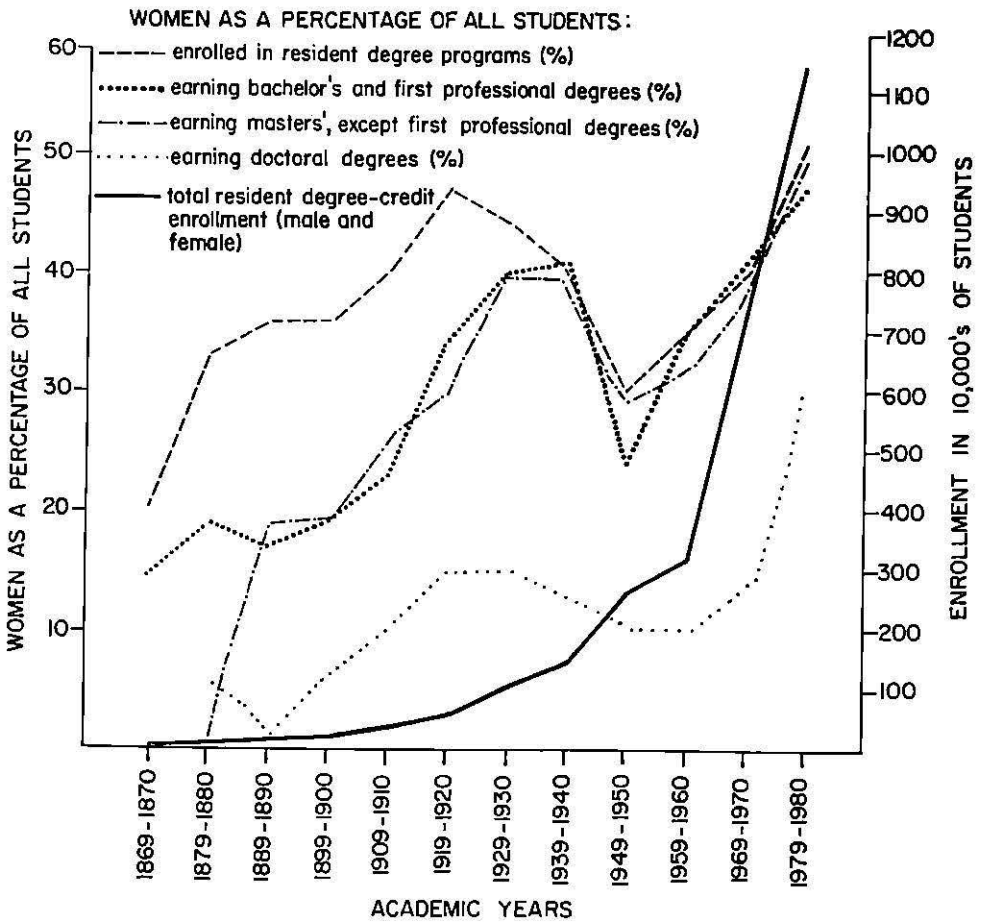
Since the establishment of the comprehensive high school in the late 1800s until the present day, girls have been more likely than boys to graduate from high school. At one time the gap in the high school completion rate of males and females was quite large, but in recent years it has become smaller (Grant and Eiden, 1982:66). Economists suggest that these differential dropout rates may be economically rational given the jobs available to members of each gender group. Jobs available to young women, such as those in the clerical field, are much more likely to require a high school diploma than the blue-collar jobs more readily available to young men (Madden, 1978).

Even though females have the advantage in high school completion, males have the advantage when college level schooling is considered. For example, within the general adult population of the United States in 1982, 16% of the men and 15% of the women had attended some college (1-3 years); and 22% of the men, but only 14% of the women had graduated from college (U.S. Bureau of the Census, 1983:146).

While these figures include data for all age cohorts, there are historical variations in the enrollment of males and females in post-secondary education in the United States. Figure 1 summarizes these variations as well as the growth of undergraduate enrollment from 1869-70 to 1979-80. Student enrollments have increased steadily since the late nineteenth century; however, the relative representation of men and women at all degree levels has varied over that period. These variations probably reflect cultural and class-specific definitions of the importance of a college education as well as specific economic and political conditions and educational policies. For instance, the economic problems of the Depression in the 1930s caused a sharp decline in the rate of growth of total college enrollment. Although the number of both men and women enrolled in college continued to rise during the Depression, the proportion of women who were enrolled or receiving degrees generally dropped, probably because families chose to invest more heavily in the college education of their sons than of their daughters. The even lower enrollment of women at the end of World War II probably reflects specific national education policies as colleges set quotas limiting the admission of women in order to absorb men returning to school on the G.I. bill (Campbell, 1973). As a result of these quotas, the proportion of students enrolled in 1949-50 who were women was lower than the proportion in 1879-80! The vast enrollment growth after World War II altered the social class distribution of college students, as men of lower-middle-class and working-class backgrounds were able to attain education beyond high school. The rising representation of women in higher education in those years parallels the

changes in the late 1800s and early 1900s as it became accepted by not just the upper-middle class but also by a greater proportion of the population that both men and women should have a college education.

Since the late 1970s over half of all college students have been women. Much of the increased enrollment of women reflects a growing representation of older women (those over 35) in undergraduate work, perhaps as these women return to school to gain the education given to their brothers or husbands in earlier years. The increased enrollment of women also involves an increased representation of women, including those under 35 years of age, in graduate programs (see Figure 1, Grant and Eiden, 1982:93).



THE EDUCATION-INCOME ASSOCIATION

Given these historical variations, one could ask whether income disparities between men and women correspond to disparities in educational attainment of various age cohorts in the population. To investigate this question, information on educational attainment and income of men and women in various age cohorts in the labor force in 1962, 1972, and 1982 is summarized in Table 2. The first columns of data give the median years of education of female workers and male workers. Clearly, the gender variations in educational attainment over time are minimal. In the older cohorts women tended to have more education than men, reflecting the greater high school drop-out rate of men and the relatively low proportion of the population which attended college. In the younger cohorts the women have slightly lower median educational levels than the men, reflecting the increasing high school completion rate of men and the growing prevalence of college attendance. The median educational level of women workers varies from 97% to 103% of that of men workers. (It is, of course, possible that the women in the younger cohorts have not yet completed their education, and the eventual disparity may be somewhat smaller.)[1]

When compared to the gender disparities in income, the variations in average educational attainment are virtually nonexistent, for the yearly incomes of full-time, year-round women workers range from only 52% to 72% of that of comparable men (see Table 2). Examination of the complete table indicates that the income ratio of female to male workers does not appear to vary with their relative education. When educational levels are very similar, income ratios are not high, by cohort or period. The income ratio varies somewhat from one historical period to the next, being most favorable to women in 1982 and least favorable in 1962. To some extent, the experiences of each cohort follow these overall patterns, with women in each age group and cohort earning more relative to men in 1962 or 1982 than in 1972. The exceptions involve age variations. Younger women (the 1928-37 cohort in 1962, the 1938-47 cohort in 1972, and the 1948-57 cohort in 1982) tend to earn more relative to men than do their older sisters in a given year. This probably reflects the relatively flat lifetime earnings curve of women (Johnson and Stafford, 1975; King, 1977). Men's earnings tend to increase over the life cycle much more than women's, even when work experience is taken into account, and this contributes to a greater sex disparity in incomes among older workers. The 1948-57 cohort in 1982 has the highest income relative to men reported in the table. This cohort is most likely to have benefited from various affirmative action and equal opportunity laws when they entered the work force. It is possible then that they may not experience this "flat lifetime earnings curve" to the same

Table 2. Relative Years of Education and Income of Female and Male Workers, Age 25–64, By Age Cohort in 1962, 1972, and 1982

Cohort		*Median Years of Education 1982 (1972)*[1]				*Ratio of Median Incomes of Female/Male Full-Time, Year-Round Earnings*		
Age in 1982	*Year of Birth*	*Females*		*Males*		*1962*	*1972*	*1982*
75–84	(1898–1907)	—	–(9.0[2])	—	–(8.7[2])	.64	—	—
65–74	(1908–1917)	11.4[2]	(12.1)	11.1[2]	(11.7)	.59	.56	—
55–64	(1918–1927)	12.4	(12.3)	12.4	(12.3)	.54	.52	.58
45–54	(1928–1937)	12.5	(12.4)	12.7	(12.5)	.63	.52	.56
34–44	(1938–1947)	12.7	(12.6)	13.1	(12.7)	—	.65	.59
25–34	(1948–1957)	12.9	(—)	13.0	(—)	—	—	.72
Total[2]		12.6	(12.2)	12.7	(12.3)	.59	.57	.63

Source: U.S. Bureau of the Census, *Current Population Reports*, Series P-60, "Income of Families and Persons in the United States: 1962," No. 41, October 21, 1963; "Money Income in 1972 of Families and Persons in the United States," No. 90, 1973; and "Money Income of Households, Families, and Persons in the United States: 1982," No. 142, 1984, U.S. Government Printing Office, Washington, D.C.

[1]Figures in parentheses are for 1972. Data were not available on education for 1962. Data on education is for all workers, full or part-time.

[2]This includes data for workers 65 years of age and older.

Table 3. Median Yearly Incomes of Full-Time Year-Round Workers, Age 25 and Over, 1982, By Race, Gender, and Educational Level

	Education Level						
	Elementary	*High School*		*College*			
	(1–8)	*(1–3 years)*	*4 years*	*1–3 yrs.*	*4 yrs.*	*5+ yrs.*	*Total*
Whites							
Males	$14,875	$18,203	$21,856	$24,179	$28,745	$32,542	$23,549
Females	$ 9,255	$10,803	$13,458	$15,721	$17,596	$21,474	$14,734
Blacks							
Males	$11,734	$15,104	$16,469	$18,839	$18,829	$25,204	$16,534
Females	$ 9,197	$10,353	$12,105	$15,177	$16,183	$21,112	$12,674

Source: U.S. Bureau of the Census, Current Population Reports, Series P-60, No. 142, *Money Income of Households, Families and Persons in the United States: 1982*, U.S. Government Printing Office, Washington, D.C., 1984, pp. 156–163.

extent as older cohorts (see also Blau, 1984b). In general, however, the results in this table suggest that gender differences in income, at least to this time, are largely unrelated to gender differences in educational attainment for specific age cohorts.

The analysis in Table 2 combined individuals with a wide range of educational levels. Similar results, however, appear when comparisons are made between males and females with similar levels of education. Table 3 gives the median income of year-round, full-time workers in each gender and major race category and with various levels of education. Within each gender group people who have less education and are nonwhite earn less than those with more education and who are white. Yet, in each of the education and race categories females earn far less than males. The advantage of white males is especially striking, for the gender difference is somewhat smaller among nonwhites than among whites. White males with a high school education have higher average yearly incomes than college graduates in any of the other groups. They also earn more than women, of either race, who have done college graduate work.

Even when various human capital variables such as work experience, training, and occupational status are taken into account a large wage gap between men and women remains. Many studies demonstrate that women appear to benefit less than men from advanced education, working in male dominated areas, and having continuous work histories (Treiman and Terrell, 1975; Suter and Miller, 1973; Featherman and Hauser, 1976; Blau, 1984a). Some studies have tried to categorize occupations by the level of skill or training which they require and then compare the salaries of male and female workers within each of these occupational levels. The results consistently confirm the conclusion that women receive less pay than do men with similar levels of skill and training (Stevenson, 1975).

GENDER TYPED AREAS OF ACHIEVEMENT

Although women and men workers with equal amounts of schooling have very different incomes, this could arise from the fact that in the later years of school women and men tend to choose different fields of study (cf. Grout, et al., 1982; Polachek, 1978). In high school, when students may elect some courses, survey data suggest that senior girls are more likely than boys to report that they have completed three years or more of English or literature, French, Spanish and business. Senior boys are more likely to report having three years or more of mathematics, science, trade-industry and technical courses (Grant and Eiden, 1982:70-71).

Gender typed areas of interest also appear in both advanced vocational and academic study. Among students entering trade-schools men more often pursue study of the traditionally male, highly paid, skilled craft areas

such as plumbing, mechanics, and carpentry. Women more often enter clerical training or training for other typically feminine and lower-paid fields. Eighty-nine percent of the associate degrees and awards in occupational (non-4 year) curriculums in health services, 66% of those in business and commerce (including clerical), but only 8% of those in mechanical and engineering technologies are given to women (Grant and Snyder, 1983; see also Roby, 1973).

Table 4 shows the proportion of men and women receiving academic college degrees in a variety of areas in 1979-80. It is clear that women are greatly overrepresented in some areas and men are overrepresented in others. For instance, among bachelor degree recipients, women are more

Table 4. Proportion of all Students Receiving Degrees from Institutions of Higher Education in the United States in 1979–80 who were Women by Field of Study and Level of Degree

Major Field of Study	*Degree*		
	Bachelor's Degree[1]	*Master's Degree*	*Doctor's Degree*[2]
Agriculture and natural resources	29.6	22.5	11.3
Architecture and environmental design	27.8	28.5	16.5
Area studies	60.5	47.8	34.5
Biological sciences	42.1	37.1	26.0
Business and management	33.6	22.3	14.4
Communications	52.3	50.5	37.3
Computer and information science	30.2	20.9	11.2
Education	73.8	70.2	44.3
Engineering	9.3	7.0	3.8
Fine and applied arts	63.2	53.3	36.9
Foreign languages	75.5	70.2	57.4
Health professions	82.2	72.3	44.7
Home economics	95.3	91.3	76.0
Letters	59.3	60.4	41.0
Library science	95.0	81.3	52.1
Mathematics	42.3	36.1	13.8
Physical sciences	23.7	18.6	12.4
Psychology	63.3	56.8	42.1
Public affairs and services	54.9	52.1	35.2
Social sciences	43.6	36.1	27.1
Theology	25.5	31.0	5.8
Interdisciplinary studies	50.1	42.2	29.4
All fields	49.0	49.4	29.7

Source: Grant and Eiden, 1982:117–121
[1]Includes degrees requiring 4 or 5 years of study
[2]Ph.D., Ed.D., etc.

often found in fields such as area studies, education, fine arts, foreign languages, health professions, home economics, letters, library science and psychology. Men are more often found in fields such as agriculture, architecture, business and management, computer science, engineering, physical sciences and theology. Similar patterns appear when the recipients of graduate degrees are studied. However, because women are less likely than men to receive doctoral degrees, they make up over half of the doctoral degree recipients in only the fields of foreign language and home economics.

These variations in area of study correspond to extensive differences in the kinds of jobs men and women hold. A number of studies show that the occupational structure in the United States is intensely segregated by sex and that this pattern of sex segregation has persisted since at least 1900. In every decade, over two times more women than we would expect by chance are in occupations that are disproportionately female, given the number of women participating in the labor force as a whole (Oppenheimer, 1968, 1970; England, 1981), although this segregation may have dropped slightly since 1920 as more men entered female-typed professions and women entered male-typed sales and clerical jobs (Blau, 1984). The jobs that women typically hold generally provide much lower pay than the jobs men hold, and thus it is suggested that the discriminatory pay differential of men and women is probably related to occupational sex segregation (Treiman and Hartman, 1981; England and McLaughlin, 1979).

Given that men and women receive training in different areas, what then, one might ask, would happen if women entered male-typed areas of study. For instance, if more women studied to be plumbers or lawyers or architects, the focus of much concern in the career counseling literature (e.g., Smith, 1980; Donahue and Costar, 1977), as well as the sociological literature noted above, could not they then earn as much as men?

Interestingly enough, the answer, while complex, generally is no. One way to approach this question is to look at the experiences of individuals with very similar training and at the same point in their work history. Students who have received their first job offers after finishing their bachelors' degrees would probably comprise such a group. A comparison of salaries offered to candidates for the bachelor's degree in various fields of study show that as late as 1982-83 men were consistently offered higher beginning wages than women in all fields but a few sub-specialities within engineering and in economics (Grant and Snyder, 1983:191 citing College Placement Council, n.d.). Even within the same occupation, women workers tend to receive lower wages than men workers and to hold positions with less prestige. The most extensive documentation involves professional workers and academics. The evidence is quite consistent in suggesting that women academics and professionals, with training and

qualifications equivalent to their male colleagues, tend to receive lower pay and have less prestigious positions (Coser, 1981; Fox, 1981, 1984). All of these studies suggest that even when women and men have similar training, skills, or jobs, they receive different rewards. While women may earn more in a male dominated field than they would in a female dominated field (Coser, 1981), they still will probably not earn as much as their male colleagues.

It is also important to consider the implications on a societal level of urging women to enter occupations which are typically held by men. Job opportunities tend to be shaped by economic forces and needs other than the available labor pool. Societies need workers in both the typically female jobs, such as clerical and service work, and the more typically male jobs, such as skilled crafts, operatives, and high level professions. Voluntary movement by some women workers into traditionally male occupations would probably not significantly alter the overall gender gap in income. Someone would have to take over the jobs which women have traditionally held. When men enter female-typed jobs, they tend to earn more than their female co-workers, but they still earn less than men with similar levels of training in male-typed jobs (Braverman, 1974; England and McLaughlin, 1979). It remains to be shown how men could be enticed away from aspiring to typically male high-paying occupations to lower-paying female typed occupations. While there has been a tendency for wages and benefits to rise in occupations when men enter them (see Schmuck, 1980, on teaching), these changes tend to take a number of years to occur and it is unlikely that job aspirants would make career choices on the basis of this possibility.

Thus, while it is undoubtedly true that gender differences in areas of study are related to the types of jobs women and men acquire and thus to the incomes which they receive, it is not clear that simply encouraging women to pursue other areas would solve the problem. Even when men and women have the same college major and when they enter the same profession, the men tend to earn more then the women. This appears to be related to the pervasiveness of occupational sex segregation. Single occupational categories, such as retail sales or teaching, tend to be further divided into jobs which women do and those which men do (Stockard and Johnson, 1980). Within the professions, women tend to have some specialties, and men tend to have others (Quadragno, 1976; Patterson and Engelberg, 1978; Astin and Bayer, 1973). Occupations may even be differentially segregated from one firm to another, with a job typically held by men in one organization, but held by women in another (Blau, 1984). This sex segregation helps justify the payment of different salaries to men and women, because they ostensibly are not doing the same work (see Malkiel and Malkiel, 1973).

EDUCATION AND CHANGING GENDER INEQUALITY

The picture of gender differences in education drawn above is not one of blatant inequality and women's low academic achievement, but primarily one of general equality and female academic success and achievement. Most women attend as many years of school as men of similar social class backgrounds. Females value academic achievement more highly than males, they get better grades, they behave better in school, and they are less likely to underachieve. Even though females are underrepresented in textbooks and testing materials, this does not appear to affect their scholastic achievement, and any independent effect on long-range achievement appears tenuous. In general, it appears that females in this country do remarkably well in education and have substantially fewer problems than males.

How then do we account for the fact that women are accorded second rank positions in the adult occupational world and generally have less access to prestige and power once they have left school? How can we explain the fact that males, who often do less well then females within schools, manage to do so much better in the adult occupational world?

A Theoretical Perspective

The answer may not be found by focusing on education as a social institution, but by examining the economy and the family, social institutions which may be more closely linked to the sources and perpetuation of male dominance. In a book published in 1980 my colleague, Miriam Johnson, and I (Stockard and Johnson,1980) examine the nature of male dominance and its persistence. We review evidence that male dominance (defined as beliefs, values, and cultural meanings that give higher value and prestige to masculinity than to femininity) exists in our cultural symbol system, in informal everyday interactions, and in social institutions and roles. We suggest that gender stratification, or hierarchical ranking of the gender groups and the separation of their activities, is reproduced in each generation, in social institutions, and in the personalities of individuals as men's motive to deprecate women develops along with their early notions of gender identity. We suggest that this system of gender stratification underlies the differential rewards men and women receive in the occupational world.

While we accept the possibility that some sex differences may have a biological basis, we review psychological studies which show few gender differences in basic capacities. Those that do appear as people grow older can generally be better explained by the different social roles that males and

females are expected to play. Children first develop their understandings of these different social roles and boys first develop the motive underlying male dominance in their interactions in the family. As children grow older and interact more with their peers, their notions of appropriate sex roles are elaborated. We suggest that the male peer group may be especially important in reinforcing the deprecation of women and the expectation that men and women should have different roles.

We end the book by discussing changes that might be necessary to produce a society without male dominance. We suggest that the most fruitful way to approach change is not to focus directly on individual motivation but on how the structure of social institutions and the patterns of interactions within them reinforce gender inequalities on the institutional, individual, and cultural levels. While legal guarantees to equality and increased education are probably necessary steps for gaining greater gender equality, we believe that changes in the polity and in education are probably not sufficient to guarantee the end of male dominance. Instead, we suggest that changes in both the economy and the family will be necessary to lessen inequality in social institutions and to decrease men's motive to devalue women and to separate their activities from those of women. These changes should be accompanied by, and reflected in, alterations in cultural beliefs and values.

In suggesting ways to deal with sex stratification in the economy we note the need to maintain affirmative action programs, equal employment opportunity laws, and other means to promote the equitable hiring and pay of women and men. The comparable worth movement advocates paying occupants of predominantly female jobs wages which are similar to those received by occupants of predominantly male jobs requiring similar levels of training and education (Treiman and Hartman, 1981). This may be another important means of promoting greater economic equality, for it directly deals with the problem of occupational sex segregation and the lower pay of female-typed jobs. Yet, given the persistence of occupational sex segregation and sex disparities in income, we suggest that economic changes are necessary, but not sufficient, to produce lasting changes in gender inequality. Simply focusing on women's work role does not appear to directly change the attention men give to the family role, nor does it assure that the various laws regarding economic equality will be followed. To deal with these problems and specifically with psychological motives underlying male dominance we turn to additional changes that focus on the family.

We suggest that one step that might minimize the psychological motives underlying male dominance is for men to become more involved in the nurturing of young children. We hypothesize that as men become more involved in nurturing young children, gender identity will not disappear but

will become less problematic and less salient. This in turn could lead to lessened motivations to deprecate the activities of women and promote strong gender role differentiation (see also Stockard and Johnson, 1979). Because sex objectification and male dominance are strongly reinforced in the male peer group, we suggest that it will also be important to devise ways to strengthen ties between males and females that are not necessarily sexually oriented and that can compete with the bonds of the male peer group.

Implications of this Analysis

It is undoubtedly true that educational equality is a necessary condition for gender equality in the occupational world. Cross-cultural evidence indicates that education is an important tool in advancing greater rights of women. For instance, the increasing education of women in both Italy and Japan has been linked to women's greater economic and social participation (Stockard and Johnson, 1980:85-6; Koyama, et al., 1967), educational changes in Muslim countries have been linked to growing political rights for women (Youssef, 1976), and the growth of the feminist movement in the late 1960s in the United States has been linked to women's greater involvement in higher education in that period (Stockard and Johnson, 1980:84). In general, the major role of education in minimizing gender inequalities may well involve the encouragement of pressure for change.

Certainly some of the reforms discussed above may have some impact on occupational sex segregation and gender differences in adult income, although the influence is probably more indirect than many authors seem to assume. For instance, young women probably learn in school about the gender-typed nature of occupations. Perhaps as more women are encouraged to enter fields that are currently typed as appropriate for males, they will exert pressures that could eventually lead to a lessening of gender segregation in those fields. The proportion of law school graduates who are women has grown substantially in recent years, from 2.3% in 1960 to 30.2% in 1980 (Grant and Eiden, 1982:126). The majority of women lawyers have traditionally specialized in areas where they do not have direct contacts with clients (Patterson and Engelberg, 1978) and it will be important to trace any changes in segregation within this field and others experiencing such change in the coming years.

Another area of educational reform that may help minimize gender inequalities, although again in an indirect manner, is the greater integration of males and females mandated by the Title IX legislation. To the extent that this greater contact tends to counteract the influence of the male peer group by promoting ties between males and females that are not sexually

oriented, it can serve to mitigate the influence of the male peer group on boys' motives to deprecate women (cf. Stockard and Johnson, 1980:281). In general, this analysis does not necessarily imply that curricular materials, classroom interactions, or other reforms are totally ineffective means of changing gender inequality.

Because most classrooms in this country are integrated by gender, the male peer group now probably finds its greatest expression in extracurricular sports activities that are still segregated (the "contact sports") and in informal interactions both within and outside the classroom. Analyses of peer group interactions suggest that the devaluation of women and the expectation that to be a "real man" one must avoid female-typed behavior are often expressed within these settings (see Stockard and Johnson, 1980:241-247). Educators interested in finding other ways to minimize gender inequalities in the adult occupational world might want to focus on mitigating the devaluation of women which is supported by these interactions. While many of these interactions occur outside the influence of school authorities, some, including those on the football field or in the locker room or on the playground in elementary schools, are well within the authority of school officials. Just as school officials outlaw racist interactions and protect other people who are potentially subject to abuse by peers, those who are concerned with eliminating gender inequalities could try to minimize sexist interactions (cf. Best, 1983).

While all of these educational reforms may be necessary conditions for gender equality in other institutional areas, they are probably far from sufficient. Change efforts, at least in this country, need to focus on institutions such as the economy and family in addition to education.

Social scientists conversant with literature in the sociology of education are no doubt familiar with arguments which discount the effectiveness of educational reforms in promoting alterations in other areas (e.g., Coleman, et al., 1966; Jencks, et al., 1972). Yet, as noted above, social scientists specializing in the study of gender roles, including those with extensive knowledge of the education literature, seem to persist in suggesting that changes in education may be an important means toward more equitable gender roles in the adult occupational world. The analysis presented here suggests that the inequalities women face in the occupational world cannot be traced, except in a most limited and tenuous manner, to educational achievement or experiences. Analyses of gender inequality and education, as well as prescriptions for change, might be enhanced by considering this conclusion.

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NOTES

1. It should be noted that the ratio of years of education of males and females in Table 2 was computed from data for all workers (full- or part-time) because data on the educational level of male and female full-time, year-round workers were not available. The income ratios were computed from data for only full-time, year-round workers because more women than men tend to work part-time and computations using data for all workers would tend to greatly overstate the wage gap. It is unclear how much bias results from this discrepancy, but it is doubtful that it is large.

One possible way to assess the discrepancy is to assume that those without incomes are similar to those with part-time employment. Data to answer this question are available for 1982. Within each age group both men and women without incomes have lower levels of education than those with incomes. Yet, when the educational levels of men and women without incomes are compared to each other, the women have levels which are quite close to those of the men in the youngest cohort, but somewhat higher than those of the men in the three older cohorts. (The latter probably reflects the presence of the unemployed, but well-educated, housewife among the women with no incomes. For the older men, not having an income more likely reflects hard-core poverty.) If the group of part-time workers is like those with no incomes, the male-female educational ratio for part-time workers in the youngest cohort would be very similar to that for all workers, while that for the older cohorts would be substantially higher. This would then imply that for full-time workers the female/male ratios of educational attainment for the older cohort would be slightly lower than those reported in the text. However, the magnitude of the differences would probably not be large and the ratios would still be much larger than those computed for income and shown in Table 2.

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