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Role Models in Education (Symposium Introduction)

Abstract
It is our hope that by assembling these papers in one place, the *Review* will contribute to future policy debate on the importance of role models in education. Moreover, the papers' findings may have even broader importance. In many respects, the relationship between teachers and students can be viewed as analogous to the relationship between supervisors and employees. If the race, gender, and ethnicity of teachers "matter," so may the race, gender, and ethnicity of supervisors in the employment relationship. These papers thus suggest analogous types of research that could be profitably undertaken that relate to the employment relationship.

Keywords
education, role models, employment relationship, faculty, students

Disciplines
Education

Comments
Suggested Citation
Ehrenberg, R. G. (1995). Role models in education (Symposium introduction) [Electronic version]. *Industrial and Labor Relations Review, 48*(3), 482-485.

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ROLE MODELS IN EDUCATION

Symposium Introduction

RONALD G. EHRENBERG*

Policies to increase the number of under-represented minorities in faculty positions in American colleges, universities, and elementary and secondary schools abound. These policies are motivated partly by distributional considerations and the desire to provide employment opportunities for members of groups that have been historically discriminated against, and partly by the belief that minority teachers may serve more effectively than non-minority teachers as role models and mentors for minority students and thus enhance their educational performance.[1]

For example, it is believed that an increased proportion of minority elementary and secondary teachers might lead to improvements in minority students' academic performance and retention rates. Similarly, it is hoped that expanding the number of minority faculty at predominantly white higher education institutions will enhance the attractiveness of these institutions to minority students, improve their chances of graduating, and promote an increased flow of minority graduates into Ph.D. programs and subsequent academic careers.

Educational institutions at all levels are also aggressively seeking to expand the number of female faculty they employ in "traditionally male fields," such as mathematics, science, and engineering. Females are under-represented in many of these fields at the collegiate level, both as students and as faculty.[2] A major reason for this under-representation is that by the time young women reach the end of their high school careers, they tend to perform more poorly than men in mathematics and science classes and on standardized tests in these fields.[3] Many point to the absence of female role models in science and mathematics at the secondary education level as part of the explanation for these outcomes, and this presumed link leads to the call for increased efforts to recruit and retain female secondary school science and mathematics teachers.

The scarcity of female faculty in traditionally male fields in higher education is also believed to contribute to the reluctance of women to major in traditionally male fields of study, to their high propensity to switch to other majors if they start out in a traditionally male field, and to the small number of women pursuing doctoral study in many traditionally male fields. Again this belief leads to calls for policies to increase the number of female faculty in these traditionally male fields.

Beliefs often drive public policy, even before they are confirmed as facts. To enhance our understanding of the extent to which faculty members' race, gender,

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[1]See Ehrenberg and Brewer (1995) for a survey of the literature that supports these beliefs.

[2]See Ehrenberg (1992).

[3]An example illustrates this point. In an effort to achieve gender balance in the allocation of National Merit Scholarships to high school seniors, test administrators weight a student's performance on the PSAT verbal aptitude test twice as heavily as his or her performance on the PSAT mathematics aptitude test in the competitions for these awards.

Industrial and Labor Relations Review, Vol. 48, No. 3 (April 1995). © by Cornell University.
0019-7939/95/4803 $01.00

and ethnicity *do* affect their students' educational outcomes and the way educational institutions operate, the ILR-Cornell Institute for Labor Market Policies sponsored a conference, "Role Models in Education," which was held at Cornell University on April 8, 1994.[4] The six papers that follow were all presented at the conference. Each was accepted for publication only after passing the screen of a refereeing process that, in some cases, required extensive revisions.

It is our hope that by assembling these papers in one place, the *Review* will contribute to future policy debate on the importance of role models in education. Moreover, the papers' findings may have even broader importance. In many respects, the relationship between teachers and students can be viewed as analogous to the relationship between supervisors and employees. If the race, gender, and ethnicity of teachers "matter," so may the race, gender, and ethnicity of supervisors in the employment relationship. These papers thus suggest analogous types of research that could be profitably undertaken that relate to the employment relationship.

The Papers

The first three papers that follow deal with the importance of female faculty as role models and mentors in higher education. Brandice Canes and Harvey Rosen's contribution addresses whether the presence of female faculty in traditionally male science and engineering fields induces female students to enter those fields. They point out that one *cannot* answer this question by looking across departments at an institution at a point in time and determining whether there is a positive correlation between the percentage of female majors in a department and its percentage of female students. The reason is that the same forces that make it attractive for women to study a subject (for example, the concern of the discipline with issues relevant to women) may also make it attractive for them to become faculty in that subject. Rather, Canes and Rosen argue, one can answer the question only by looking at whether changes over time in the proportion of a department's faculty that are women are positively associated with changes in the proportion of the department's majors that are women.

Canes and Rosen conduct such tests using several years' data on the fractions of female faculty and majors in different fields at a private research university (Princeton), a public research university (Michigan), and a coeducational liberal arts college (Whittier). Using panel data methods, they find no evidence that an increase in the fraction of female faculty in a department was associated with an increase in the fraction of its majors that were female. Moreover, this finding is robust to a wide variety of alternative specifications.

Why did these authors fail to find any evidence to support the "role model" hypothesis? One possibility, they suggest, is that the importance of role models and mentors may be much greater at earlier stages in a student's educational career than at later stages.[5] A second possibility is that the institutions in Canes and Rosen's sample are representative of only a subsample of American colleges and universities. Perhaps role models are important in other institutional settings.

Sarah Solnick's paper picks up on this second point. A young woman's initial choice of major, Solnick observes, typically is made prior to her arrival in college, and this decision may well influence the type of college she chooses to attend; but once at a college, a student may either persist in a

[4] I organized the conference, whose funding was provided by the William H. Donner Foundation and Cornell University. It was attended by over 50 academics and representatives from foundations and government agencies. The academics spanned the disciplines of engineering, biotechnology, economics, organizational behavior, sociology, human service studies, education, collective bargaining, and personnel and human resource research.

[5] This possibility is addressed in the paper by Ronald Ehrenberg, Dan Goldhaber, and Dominic Brewer later in the symposium.

major or change to a different major. Solnick hypothesizes that women who begin in traditionally female majors are more likely to shift to other majors if they attend a traditionally single-sex women's college than if they attend a coeducational institution. Similarly, she hypothesizes that women who start in traditionally male majors are more likely to persist in those majors if they attend single-sex colleges.

She tests these hypotheses using data on the anticipated (at time of entrance) and final majors of 2,500 female students from eight women's and seven coeducational institutions. She finds evidence to support the first hypothesis but not the second. Although Solnick's results are somewhat limited by the non-representative nature of the coeducational schools in her sample (for example, no comprehensive research universities are included), they do suggest one way in which single-sex schools may benefit female students: by providing them with more flexibility to move into majors in traditionally male-dominated fields that tend to be more handsomely rewarded in the labor market. Whether this pattern is due to these schools' predominantly female faculties or to their predominantly female student bodies is not addressed in Solnick's study.

Donna Rothstein's paper addresses the role of female faculty as mentors and role models in a different way. She uses data from the National Longitudinal Study of the High School Class of 1972 to analyze whether, after controlling for student and institutional characteristics, the percentage of female faculty at a higher education institution influenced its female students' educational and labor market outcomes. She finds that the percentage of female faculty at a college or university was positively associated with the probability that its female students would attain an advanced degree. She does *not* find that the percentage of female faculty was a statistically important direct determinant of female students' later earnings, and although it did have an indirect impact through its effect on advanced degree attainment, that impact was small.[6] Hence, although female faculty may influence the educational level their female students attain, they do not appear to influence those students' earnings very much.

Jill Constantine's paper shifts the discussion to a consideration of the impact of historically black colleges and universities (HBCUs) on the black students who attend them. HBCUs are the public and private institutions that were established to provide higher education for black students who were formally excluded from southern segregated white colleges and universities during much of our nation's history.

Do HBCUs provide unique advantages for black students that are currently unobtainable at other institutions? In a recent paper, Donna Rothstein and I provided an initial analysis of this question, using data from the National Longitudinal Survey of the High School Class of 1972 (NLS-72).[7] We found that attendance at an HBCU substantially enhanced the probability that a black college student would receive a bachelor's degree within seven years after starting college; however, on average, it had no apparent effects on the student's early career labor market success (as measured by 1979 earnings) or on the student's probability of enrolling in graduate school. Thus, we concluded that although black students in the 1970s were more likely to graduate college if they attended an HBCU than if they attended a non-HBCU, such attendance did not yield any extra payoff in the labor market.

Constantine's analyses challenge the latter conclusion. Her approach differs from ours in several ways: she uses a more complicated model of the educational sector chosen than we did; transcript data on educational attainment rather than self-reported educational attainment; and labor market data from 1986 rather than 1979, profiling respondents later in their careers

[6]Her estimates imply that an increase in the proportion of female faculty by .1 would increase female college graduates' earnings by less than 1 percentage point.

[7]Ehrenberg and Rothstein (1994).

than we did. She finds that black students who attended HBCUs did receive higher earnings than they would have if they had attended non–HBCUs. Indeed, in some cases, she estimates that attendance at an HBCU led to an earnings premium in the range of 35%. Future research will be required to pin down which of the differences between the Ehrenberg/Rothstein and Constantine papers are responsible for the differences in their findings.[8]

Canes/Rosen and Solnick's suggestion that role models and mentors may be more important early in an individual's career than later in the career is a theme explored in the paper by Daniel Goldhaber, Dominic Brewer, and myself, which addresses the importance of teachers' race, gender, and ethnicity in secondary schools. Using data from the National Educational Longitudinal Study of 1988, which permits researchers to match students with individual teachers, we examine how a teacher's race, gender, and ethnicity influence students from both the same and different race, gender, and ethnic groups.

On balance, our study finds that teachers' race, gender, and ethnicity were much more likely to influence teachers' subjective evaluations of their students than to influence how much students learned. For example, although white female mathematics and science students' test scores did not increase more if their mathematics and science teachers were white women than if they were white men, white female teachers in these fields tended to evaluate these students more highly than did white male teachers. To the extent that these higher subjective evaluations are communicated to the students or lead to placement of the students in higher "track" classes, these female teachers may well be serving as mentors for their female students.

The last paper in the symposium, that by Pam Tolbert and her colleagues, differs from the previous five in that it addresses organizational dynamics, not students' outcomes. Tolbert et al. are concerned with whether the gender composition of faculty in academic sociology departments influences the turnover rates of female faculty.

Drawing on panel data for 50 sociology departments over a 12-year period, Tolbert et al. find that the turnover rate among female faculty in a department at first increased as the proportion of female faculty in the department increased, then decreased, but only after the female proportion of the faculty attained a value of .35 to .40. Male faculty members' turnover did not increase as the department became more female. Since high turnover rates of female faculty make it more difficult to maintain or increase the proportion of women on the faculty, one implication of these findings is that departments should seek to understand what factors apparently reduce the attachment of female faculty to departments when the proportion of female faculty begins to increase, and take steps to eliminate these factors.

[8]For example, Constantine convincingly explains in her paper why it is preferable to use data later in an individual's career to estimate earnings differentials. However, the 1986 wave of the NLS-72 data was only a subsample of the original sample, and college graduates were systematically over-represented in the 1986 subsample. The extent to which this feature of Constantine's data biases her results has yet to be fully analyzed.

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