



---

The Growing Female Advantage in College Completion: The Role of Family Background and Academic Achievement

Author(s): Claudia Buchmann and Thomas A. DiPrete

Source: *American Sociological Review*, Vol. 71, No. 4 (Aug., 2006), pp. 515-541

Published by: American Sociological Association

Stable URL: <http://www.jstor.org/stable/30039008>

Accessed: 16/04/2009 19:51

---

Your use of the JSTOR archive indicates your acceptance of JSTOR's Terms and Conditions of Use, available at <http://www.jstor.org/page/info/about/policies/terms.jsp>. JSTOR's Terms and Conditions of Use provides, in part, that unless you have obtained prior permission, you may not download an entire issue of a journal or multiple copies of articles, and you may use content in the JSTOR archive only for your personal, non-commercial use.

Please contact the publisher regarding any further use of this work. Publisher contact information may be obtained at <http://www.jstor.org/action/showPublisher?publisherCode=asa>.

Each copy of any part of a JSTOR transmission must contain the same copyright notice that appears on the screen or printed page of such transmission.

JSTOR is a not-for-profit organization founded in 1995 to build trusted digital archives for scholarship. We work with the scholarly community to preserve their work and the materials they rely upon, and to build a common research platform that promotes the discovery and use of these resources. For more information about JSTOR, please contact [support@jstor.org](mailto:support@jstor.org).



*American Sociological Association* is collaborating with JSTOR to digitize, preserve and extend access to *American Sociological Review*.

<http://www.jstor.org>

# The Growing Female Advantage in College Completion: The Role of Family Background and Academic Achievement

Claudia Buchmann  
Ohio State University

Thomas A. DiPrete  
Columbia University

*In a few short decades, the gender gap in college completion has reversed from favoring men to favoring women. This study, which is the first to assess broadly the causes of the growing female advantage in college completion, considers the impact of family resources as well as gender differences in academic performance and in the pathways to college completion on the rising gender gap. Analyses of General Social Survey data indicate that the female-favorable trend in college completion emerged unevenly by family status of origin to the disadvantage of sons in families with a low-educated or absent father. Additional analyses of National Educational Longitudinal Survey (NELS) data indicate that women's superior academic performance plays a large role in producing the gender gap in college completion, but that this effect remains latent until after the transition to college. For NELS cohorts, who were born in the mid-1970s, the female advantage in college completion remains largest in families with a low-educated or absent father, but currently extends to all family types. In conjunction with women's growing incentives to attain higher education, gender differences in resources related to family background and academic performance largely explain the growing female advantage in college completion.*

In the United States, women currently far outnumber men among new college graduates. Trend statistics reflect a striking reversal of a

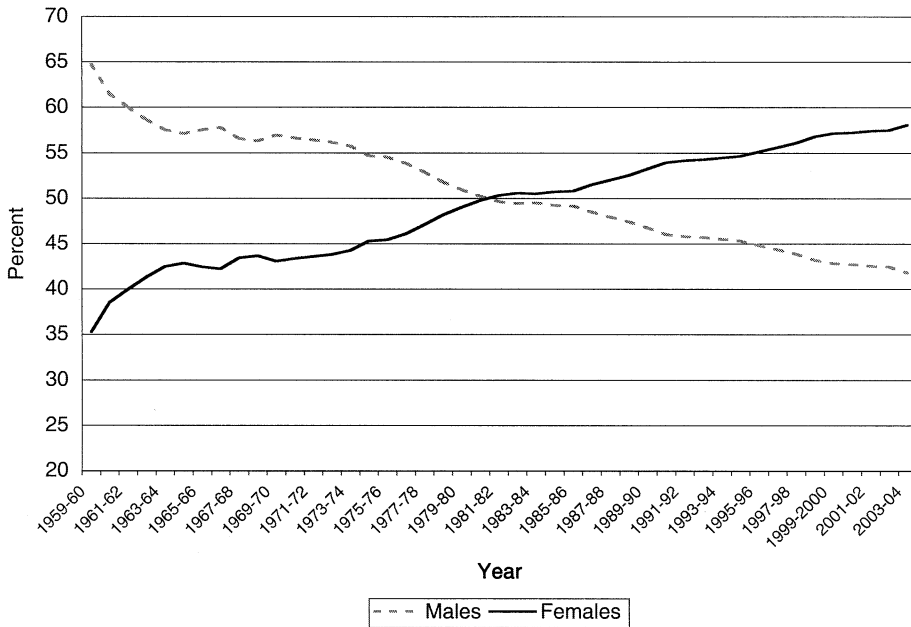
gender gap in higher education that once favored males. In 1960, 65 percent of all bachelor degrees were awarded to men (Figure 1).<sup>1</sup> Women continued to lag behind men in college graduation rates during the 1960s and 1970s, until 1982, when they reached parity with men. From 1982 onward, the percentage of bachelor's degrees awarded to women continued to climb such that by 2004 women received 58

---

Direct correspondence to Claudia Buchmann, Department of Sociology, 391 Bricker Hall, 190 N. Oval Mall, Columbus, OH 43210 (buchmann.4@osu.edu), or Thomas A. DiPrete, Department of Sociology, Columbia University, 415 Fayerweather, Mail Code 2551, 1180 Amsterdam Avenue, New York, NY 10027 (tad61@columbia.edu). The authors are listed in alphabetical order. Earlier versions of this article were presented at New York University in September, 2004, and at Indiana University in February, 2006. The authors thank Richard Arum, Dalton Conley, Michael Hout, Karl Alexander, and three anonymous *ASR* reviewers for valuable comments; and Jerry A. Jacobs for his help and insight. The Center for Child and Family Policy at Duke University supported this research. The authors analyzed the restricted NELS-88 data under terms of a license between DiPrete and the National Center for Education Statistics (NCES).

---

<sup>1</sup> Female college completion rates in the 1960s were lower than at other times in history. Goldin (1995) found that women's college enrollment rates exceeded 90 percent of men's rates between the 1890s and the 1920s, although, as Jacobs (1996) notes, Goldin's estimates were likely inflated because less rigorous "normal schools" were included in these figures. That female graduates from elite backgrounds were more likely during this early period (Jacobs 1996) is consistent with the notion discussed later in the article that high status families had more egalitarian views about education for sons and daughters.



**Figure 1.** Bachelor's Degrees Awarded to Men and Women in the United States, 1959–2004  
*Source:* U.S. Department of Education. 2004. Digest of Education Statistics, Table 247.

percent of all bachelor's degrees (U.S. Department of Education 2004).<sup>2</sup> The U.S. Department of Education predicts that the "new" gender gap in college completion will continue to widen over the next decade.

The pervasive nature of the gender gap reversal from a favoring of males to a favoring of females makes it all the more striking. The female advantage in college completion exists across all racial and ethnic groups in the United States, and it is found in most industrialized societies. In the United States, women currently earn 67 percent of all bachelor's degrees awarded to blacks.<sup>3</sup> The figures are 61 percent

for Hispanics, 61 percent for Native Americans, 54 percent for Asians, and 57 percent for Whites (U.S. Department of Education 2004, Table 263). Beyond the United States, higher proportions of females than males currently attain tertiary education in most European countries as well as in Australia, Canada, and New Zealand (Eurostat 2002; Organization for Economic Cooperation and Development [OECD] 2004). The 30 member nations of the OECD nearly all show a growing gender gap that favors women. The once prevalent male advantage in college completion has disappeared in all but four countries.<sup>4</sup>

The rising female advantage in college completion is an important topic of study in its own right as a rare example of a *reversal* of a once persistent pattern of stratification, and also because of its potential impacts on labor markets, marriage markets, family formation, and other arenas. Shifting educational attainment

<sup>2</sup> Women also are more likely to enroll in graduate school. In 2003, women earned 59 percent of all master's degrees, but they earned slightly less than half of all first professional degrees (48 percent) and doctoral degrees (47 percent) (U.S. Department of Education 2004, Table 247).

<sup>3</sup> It appears that the especially large gender gap for blacks does not constitute a reversal, but rather a continuation of a long female-favorable trend. As early as 1954, when the great majority of black college students were enrolled in historically black colleges and universities (HCBUs), women comprised 58 percent of the students enrolled in HCBUs. When the Census Bureau began tracking bachelor's degrees

by race and gender in 1974, women earned 57 percent of all degrees awarded to blacks (Cross 1999:7).

<sup>4</sup> Among 25- to 34-year-olds, a male advantage in tertiary attainment of several percentage points persists in Switzerland, Turkey, Japan, and Korea (OECD 2004, Table A3.4c).

rates for men and women could affect gender gaps in wages, labor force participation, and a host of other labor market outcomes (Bernhardt, Morris, and Handcock 1995). The rising proportion of college-educated women relative to men could alter trends in educational assortative mating, as more women marry down, delay marriage, or forego marriage altogether (Lewis and Oppenheimer 2000). These changes, in turn, may have an impact on family formation and parenting (Bianchi and Casper 2000). In addition to these broad social implications, the gender gap is causing concern among college administrators, who worry that the gender imbalance is detrimental to campus diversity (Gose 1997; Thompson 2003), and among admissions officers, who are considering affirmative action for male applicants (Greene and Greene 2004). Clearly, understanding the causes and consequences of the growing female advantage in college completion is an important task for social scientists.

Despite its importance, virtually no research has investigated this issue. A decade ago, Jacobs (1996:156) noted that the literature on gender inequalities in education “often treats all aspects of education as disadvantaging women.” This tendency remains true today. Most research addresses aspects of education in which women trail men, such as gender segregation in majors (Charles and Bradley 2002; Jacobs 1995; Turner and Bowen 1999), women’s underrepresentation at top-tier institutions (Jacobs 1999), and their underrepresentation in science and engineering (Fox 2001; Long 2001; Xie and Shauman 2003). The paucity of research in one very important realm where women are outpacing men, namely college completion, constitutes a major gap in the literature. Following Jacobs (1996), we argue that failure to analyze the ways in which women are advantaged in education (as well as those in which they continue to trail men) leads to a skewed and incomplete understanding of gender stratification in education.

In this article we ask: “Why have women caught up to and then outpaced men in college completion?” The few studies on the female advantage in higher education to date focus either on a single explanation that can be only part of the answer (e.g., higher noncognitive skills among women [Jacob 2002]; more rapidly rising returns to higher education for women [DiPrete and Buchmann 2006]) or on a very spe-

cific subpopulation (e.g., low-income second-generation immigrants in New York City [Lopez 2003]). In contrast, this is the first study to assess broadly the causes of the growing female advantage in college completion with nationally representative data for the United States. Additionally, it pays careful attention to how the female-favorable trend varies for different social origin and racial groups.

In a recent paper (DiPrete and Buchmann 2006), we show that the value of college completion in terms of its combined impact on labor market earnings, marriage, household standard of living, and insurance against income deprivation has risen faster for women than for men in recent decades. We acknowledge, however, that rising incentives for pursuing higher education can be only part of the reason for women’s growing rates of college completion. Resources are a crucial determinant of an individual’s ability to respond to incentives, and inequalities in resources are a major determinant of inequalities in educational attainment. A large body of sociological research, much of it in the status attainment tradition, demonstrates the importance of parental education and other family-related resources to an individual’s educational attainment (Blau and Duncan 1967; Jencks 1972; Sewell, Haller, and Portes 1969). Resources related to family background exert their influence at each level of educational attainment, partly through academic performance and partly through educational transitions, given performance. Although sons and daughters share the same household, historically, they have not had equal access to parental resources. Recent major cultural changes, especially declines in sex-role stereotyping and gender discrimination, have led to changes in parents’ investments in children that constitute a shift in family resources toward girls (Behrman, Pollak, and Taubman 1986; Hauser and Kuo 1997; Jacobs 1996). Importantly, however, there are good reasons to believe that this process has not occurred uniformly across all types of families.

Thus, the goal of this study is to elucidate the role of resources, as opposed to incentives—broadly conceived as resources related to family background and resources related to academic performance—in explaining why women have caught up to men and outpaced them in college completion. We develop a two-

part strategy to achieve this goal. First, we theorize about why the gender-specific effects of parental resources may vary by family type and consider the potential impact of family resources on the rising gender gap. Second, we determine whether aspects of the educational career, including academic performance and intermediate educational transitions, mediate the effects of parental resources on educational attainment. We examine whether a gender-specific change has occurred in the role of academic performance in college completion, and whether such a change can be linked to the changing gender-specific effects of parental resources.

The first part of our study examines how the female-favorable trend in college completion evolved in recent decades and addresses the question of whether the gender gap emerged differently for groups with different social origins. Using data from the General Social Surveys, we find important changes in the gender-specific effects of family background during the second half of the 20th century. In cohorts born before the mid-1960s, daughters were able to reach parity with sons only in the minority of families whose parents both were college educated, whereas parents with less education appeared to favor sons over daughters. But this pattern changed for cohorts born after the mid-1960s, such that the male advantage declined and even reversed in households with less well educated parents, or those with an absent father.

The second part of our study uses data from the National Education Longitudinal Study (NELS-88, hereafter NELS) for the 1973–1974 birth cohort to examine the role of gender differences in academic resources, including academic performance and intermediate educational transitions, as well as the role of family background in explaining the female advantage in college completion for recent cohorts. For the NELS cohort, the female advantage remains largest in families with absent or high school–educated fathers, but now extends to all family types. The primary factor generating a gender difference in college completion rates is the higher dropout rate from 4-year colleges for males. Moreover, although girls outperform boys in middle school and high school and are more likely to enroll in postsecondary education, girls are not more likely than boys to enroll in 4-year colleges. Via a decomposition

analysis, we map out the gender differentials in the various pathways that lead to college completion and assess the impact of academic performance and various educational transitions on the likelihood of college completion. We find that women's superior academic performance plays a large role (especially for white women) in producing the gender gap in college completion, but this effect remains latent until after the transition to college occurs, when it manifests itself through the positive relationship between college performance and college completion. A smaller portion of the female advantage in college completion can be traced back to the family of origin, specifically to gender-specific differences in the father's education or the absence of a father in the family during middle school. These gender-specific effects of the father's status appear to have their primary impact on the likelihood of transitions between secondary and tertiary education and on college completion, given attendance, rather than on academic performance per se in high school or college.

### EXPLANATIONS FOR THE EMERGENCE OF THE NEW GENDER GAP

Explanations for the female-favorable trend in higher education must be able to elucidate not only how women caught up to men in higher education, but also why the female rate now exceeds and continues to pull away from the male rate of college completion. Sociological and economic approaches to the study of educational attainment emphasize two major determinants. One determinant is incentives that stem from the value of education, whether this value is considered in terms of the labor market (Becker 1964) or the marriage market (DiPrete and Buchmann 2006; Goldin 1992, 1995), or more broadly to include intellectual development as a necessary ingredient needed for women to achieve the full development of their talents and faculties (Jacobs 1996). A second major determinant of educational attainment is resources. Sociological theories have long recognized and research has repeatedly confirmed that family-based financial, social, and cultural resources all play a central role in educational attainment.

Given their centrality in the attainment process more generally, incentives and resources

arguably also play central roles in explaining the rising gender gap in attainment that favors women. Women's incentives to obtain more education are linked with declining gender discrimination in the labor market and changing conceptions of the opportunity structure for women in society. Their ability to act on these incentives depends on the resources provided by parents in early socialization during childhood and on the resources provided by parents and schools in the education process during adolescence and young adulthood.

Declining gender discrimination or any other source of change in the perceived value of education or work for women would be expected to affect educational attainment via family processes. Family economy perspectives view educational attainment as a rational product of family decision making. When faced with labor markets and family systems that privilege males, a family's first priority should be the education of sons (Becker 1991; Becker and Tomes 1979; Papanek 1985; Rosenzweig and Schultz 1982). In contrast, feminist theories attribute the historical tendency for American parents to favor sons over daughters in labor market-relevant investments to a patriarchal culture (Epstein 1970; Hess and Ferree 1988; Walby 1986).<sup>5</sup> From either perspective, changes in the perceived desirability of education for women could have stimulated a new pattern of parental investment and a reduction of the male advantage in educational attainment without regard to the characteristics ascribed to the family of origin.

Other perspectives predict that changing investment patterns are not uniform across families, but rather depend on the socioeconomic and demographic characteristics attributed to the

family of origin. Heterogeneity in investment patterns across families, coupled with socioeconomic and demographic trends in families and structural changes in labor markets and educational institutions, arguably could have produced the observed reversal from a male advantage to the current female advantage in college completion.

According to the gender-egalitarian perspective, parents who are better educated tend to hold more egalitarian values and may strive to ensure that sons and daughters receive equal education. Many studies document more egalitarian gender-role attitudes among individuals with higher levels of education both in the United States (Cherlin and Walters 1981; Thornton, Alwin, and Camburn 1983; Thornton and Freedman 1979) and in European countries (Alwin, Braun, and Scott 1992; Dryler 1998). Research also suggests that gender-role orientations have shifted gradually from a traditional to a more egalitarian tendency over the past few decades, but considerable heterogeneity still exists in the American population (Axinn and Thornton 2000; Brewster and Padavic 2000; McHugh and Frieze 1997; Twenge 1997). According to the gender-egalitarian perspective, if the "rate of return" to parents' education is higher for girls than for boys, then the combination of a stable higher rate of return to parental education for girls and historically rising levels of parental education could lead to a closing of the gender gap in higher education that traditionally favored men. The gender-egalitarian approach to education could have spread not only as a result of rising parental education levels, but also as a result of less-educated parents emulating highly educated parents. The diffusion of this egalitarian ethos could have contributed to women's catching up with men, but it cannot account for women exceeding men in their educational attainment. We empirically assess the extent to which this pattern has grown over the period we consider, and whether this change is attributable to a compositional change or a diffusion of this cultural norm.

The gender-role socialization perspective stresses the importance of gender-specific role modeling and argues that girls look to their mothers and boys to their fathers as they develop their educational and occupational aspirations (Downey and Powell 1993; Powell and Downey 1997; Rosen and Aneshensel 1978). A

---

<sup>5</sup> That women have experienced discrimination during the course of American history is not in doubt. But it does not follow that discrimination extended to all spheres of life. Nor does it follow that the extent of discrimination followed a monotonic trend. Considerable evidence indicates that gender gaps in education have alternately grown and shrunk during the past 150 years. The primary difference between the experiences of women and men born in the late 19th century was not in the opportunity for college, but rather in the opportunity for the college-educated to combine work, marriage, and fertility (Goldin 1992).

“family-structure” version of the gender-role socialization hypothesis predicts that because of fathers’ importance as role models for sons, boys differentially suffer from the absence of a father in the household (e.g., Powell and Parcel 1997; Sommers 2000).<sup>6</sup> Thus, the rising proportion of households headed by women in recent decades, attributable to rising rates of divorce and nonmarital childbearing (Cancian and Reed 2001), could result in a compositional trend in education attainment that advantages females over males. A compositional trend could occur also if the education and occupation of the same-sex parent is more important to his or her children’s education than those of the opposite-sex parent. A female-favorable trend in higher education would result from upward trends in parents’ status to the extent that maternal trends are stronger than paternal trends, or to the extent that the female-specific advantage from mothers is greater than the male-specific advantage from fathers.

Some researchers doubt the importance of gender-role socialization. Using retrospective data provided by adult respondents born before the 1960s, Kalmijn (1994) estimated a set of transition models for high school completion and higher educational attainment. He assessed whether the status of mothers and fathers influences the educational attainment of sons and daughters equally, and whether the influence of mothers’ status has changed over time. Kalmijn (1994:272) concluded that “the process of educational attainment is much the same for men and women,” but he studied a period before the female-favorable gap in higher education had emerged. Korupp, Ganzeboom, and Van Der Lippe (2002) likewise maintain that the effects of a mother’s education and occupation are as important for sons as for daughters.

It also is possible that female-favorable trends in higher education were produced by gender-specific changes in the salience of parental resources. Cultural changes may have heightened the importance of an educated mother as a career role model for girls. Similarly, in combination with the rise of female-headed house-

holds, structural changes may have increased the vulnerability of male children to educationally risky behaviors such as delinquency or gang membership in the absence of a father. Meanwhile, changes in the structure of wages have pushed blue-collar fathers to the margins of middle-class status and may have thereby differentially harmed the educational prospects of their sons relative to their daughters. We consider whether such gender-specific changes in the importance of parental resources explain, in part, the female-favorable trend in college completion.

How might educational performance contribute to this trend? One conjecture, frequently cited in the press but not yet substantiated empirically, is that female-favorable trends in college completion are attributable to trends in academic achievement, whereby girls outperform boys in high school and engage in behaviors that increase their likelihood of college enrollment. However, the inadequacy of this explanation, at least when taken in its popular form, is immediately apparent in light of evidence that girls have long outperformed boys in school. Early research using survey data for high school students in the 1950s and 1960s found that girls received higher grades than boys, had higher class standing, and, by the early 1970s, took courses as rigorous as those taken by boys (Alexander and Eckland 1974; Alexander and McDill 1976; Thomas, Alexander, and Eckland 1979). In fact, much of the previous research on gender differences in educational attainment sought to explain the anomaly of women’s lower rates of college enrollment and completion in light of their superior academic performance relative to men (Alexander and Eckland 1974; Jacobs 1996; Mickelson 1989). Given the long history of a female advantage in academic performance, some other factor or factors must be changing for this advantage to play a decisive role in the observed trend in college completion. Declining gender discrimination, changing incentives for higher education, and the impact of these changes on resource provision by families are likely crucial elements in the process.

In fact, declining gender discrimination, rising incentives for higher education, and subsequent changes in families’ investments in daughters may have caused the female advantage in educational performance to *grow* in

<sup>6</sup> But see Powell and Downey (1997) and Krein and Beller (1988) for equivocal findings concerning the family structure version gender-role socialization arguments.

recent decades. Using data from six U.S. national probability samples spanning 1960 through 1992, Hedges and Nowell (1995) found a larger variance in test scores for males than for females on some achievement tests, a gradual reduction of the male advantage in math and science tests, and no reduction in the female advantage in tests of reading and writing ability. Other research indicates that compared with boys, girls possess higher levels of “noncognitive” skills (e.g., attentiveness and organizational skills) that facilitate academic achievement and increase their probability of college enrollment (Jacob 2002). Teachers consistently rate girls as putting forth more effort and as being less disruptive than boys in high school (Downey and Vogt Yuan 2005). Girls also are currently outpacing boys in the number of college preparatory courses and the number of advanced placement examinations they take in high school (Bae et al. 2000). We assess the role of such gender differences in academic performance and behaviors in explaining the growing female advantage in college completion.

A final explanation for the growing female advantage in college completion that we consider is that the pathways into or through higher education have changed in a gender-specific or gender-by-class-specific way. The second half of the 20th century witnessed the dramatic expansion of both the community college system and the 4-year college system. Statistics from the October 2002 Current Population Survey show that the 2-year college enrollment advantage of females is larger than their 4-year college enrollment advantage.<sup>7</sup> If community college serves as a springboard to enrollment and graduation from a 4-year college, the expansion of the community college system could generate a female-favorable trend in college completion. Similarly, given continued gender segregation in college majors (Charles and Bradley 2002; Jacobs 1999), if grade inflation were stronger in female-dominated majors than in male-dominated majors, and if college grades influenced the probability of college completion,

the consequence would be a growing female advantage in college completion that is explained by gender differences in the distribution across majors.

None of these explanations are mutually exclusive, and each may have played some role in causing females to outpace males in their college completion rates. Some of these explanations (e.g., the decline in discrimination and the societal change in familial investment and socialization patterns) are based on broadly uncontested facts whose impact on educational trends is nonetheless difficult to estimate with precision. In the analyses that follow, we first address the potential of changing family resources to account for the female-favorable trend in higher education. We then assess the role of gender differences in academic resources, specifically differences in academic performance and intermediate educational transitions, in explaining the current female advantage in college completion. Throughout these analyses, we examine whether the relationships between gender-specific academic resources and college completion differ for different racial and social origin groups.

#### **TRENDS IN FAMILY BACKGROUND AND THE GROWING FEMALE ADVANTAGE IN COLLEGE COMPLETION: ANALYSIS OF DATA FROM THE GENERAL SOCIAL SURVEYS**

To determine how family processes affected the female-favorable trend in college completion, either alone or in combination with broader system-level changes, we analyze data from the cumulative cross-sectional General Social Surveys from 1972 through 2002. The 24 annual General Social Surveys (GSS) administered during this period provide information on the educational attainment of respondents and their fathers and mothers, the socioeconomic status of the fathers, and several other measures of family background (National Opinion Research Center 2003).<sup>8</sup> The availability of data from

<sup>7</sup> In 2002, females outpaced males in the second year of 4-year colleges at a rate of 1.22, and they outpaced males in the second year of 2-year colleges at a rate of 1.33. See <http://www.census.gov/population/www/socdemo/school/cps2002.html> for details.

<sup>8</sup> The GSS was not administered in 1979, 1981, 1992, 1995, 1997, or 1999, so the waves of data total 24 over this 30-year interval. Surveys were not conducted in 1979, 1981, and 1992 because of funding shortages. Since 1994, the GSS survey has been



**Table 1.** College Completion Rates by Parents' Education and Family Structure, GSS data

Mother's Education	Father's Education						
	High school or less		Some college or more		Father not present		
	Male	Female	Male	Female	Male	Female	
<b>A. White 1938–1965 Birth Cohorts</b>							
High school or less	%	19.5	14.3	41.6	34.6	19.3	13.5
	N	1,349	1,649	330	365	197	281
Some college or more	%	37.7	23.9	60.2	63.1	35.1	30.0
	N	183	239	374	429	77	70
<b>B. White 1966–1977 Birth Cohorts</b>							
High school or less	%	12.4	16.6	38.8	33.6	13.7	13.1
	N	241	271	103	110	73	84
Some college or more	%	26.2	40.8	61.5	63.6	26.1	37.0
	N	65	71	174	195	46	54

Source: Authors' calculations of 1972–2002 General Social Survey data.

Note: Table shows percent of white males and females ages 25–34 that have completed college. GSS = General Social Surveys.

1972 to 2002 makes the GSS valuable for examining trends in higher education during the period when the shift from a male to a female advantage in college completion occurred.

We restrict the analysis of college completion to white respondents between the ages of 25 and 34 years who were born between 1938 and 1977 (the black GSS sample is too small to support a similar trend analysis). The dependent variable, college completion, is operationalized as the completion of at least 16 years of education. Definitions of all variables are provided in Appendix A.

We begin by examining the relationship between parents' education, fathers' absence, and rates of male and female college completion for two specific historical periods. It should be noted that for all the analyses in this report we follow the conventions of the GSS and NELS survey data such that "mother" means any female guardian and "father" means any male guardian. The first period covers birth cohorts born between 1938 and 1965 and includes people who grew up before the point at which women overtook men in their rates of college completion.<sup>9</sup> The second period covers birth

cohorts between 1966 and 1977 and includes those who grew up during the time when women began to overtake men in their college graduation rates. These results are presented in Table 1.

Panel A shows that for cohorts born in 1965 or earlier, males are more likely than females to have completed college in all except one of the family types displayed. Only when both parents had at least some college education were women as likely as men to have completed college. When either fathers or mothers had a high school education or less, sons were more likely to complete college than daughters. If no father was in the household when the youth were 16 years old, sons still were more likely to complete college than daughters. This pattern is consistent with the gender-egalitarian perspective. It provides little support for the gender-role socialization perspective, which predicts higher graduation rates for daughters of educated mothers. In fact, the female disadvantage is greater for families in which the mother has some college and the father has a high school education or less (37.7 – 23.9 percent = 13.8 percent) than it is for families in which the father has some college and the mother has a high school education or less (41.6 – 34.6 percent = 7.0 percent).

administered every other year, with roughly double the usual sample size (Inter-university Consortium for Political and Social Research [ICPSR] 2003).

<sup>9</sup> We exclude cohorts born before 1938 because the historical period of their youth, which was dominated

by the Great Depression and World War II, is so different from the postwar period.

Panel B of Table 1 shows a different pattern for the 1966–1977 birth cohorts. It suggests the emergence of a strong gender-role socialization effect. In cases involving parents who both had at least some college education, the completion rates for males and females look very similar to those of the earlier cohorts in Panel A. But in all other cells, the changes in graduation rates are quite large, and generally to the advantage of females. Where fathers had a high school education or less, daughters increased their rates of college completion, whereas the graduation rates of sons dropped, regardless of the mothers' level of education. The graduation rates of sons who had no father present at the age of 16 years also dropped considerably. Only in families in which fathers have some college and mothers have a high school education or less do males maintain a considerable advantage (5.2 percent) over females. In contrast, daughters had a 14.6 percent advantage in college completion over sons in families with mothers who had some college and fathers who had a high school education or less. A shift appears to have taken place between these two periods such that the mother's level of education has become more important for daughters and the father's level of education has become more important for sons.

While informative, Table 1 provides no test for the statistical significance of the apparent interaction between family background, cohort, and gender. To address this issue, we estimated a logistic regression of college completion on the effects of family background. These results are presented in Table 2. Model 1 includes a dummy variable for the period (1 = 1966–1977 cohorts, 0 = 1938–1965 cohorts), gender (1 = female), the mother's education (1 = at least some college, 0 = high school or less), the father's education (1 = at least some college, 0 = high school or less), and no father present in the household when the youth are 16 years of age. It also includes all possible two-way interaction effects between these variables plus a two-way interaction involving gender and the combination of no father present or father's education of high school or less; a three-way interaction involving gender, cohort, and the combination of no father present or father's education of high school or less; and a three-way interac-

tion involving gender, cohort, and mother's education.

The estimates in Model 1 show that males who had no father in the household at the age of 16 years or whose father completed a high school education or less had significantly higher odds of completing college than similarly situated females in the earlier cohorts (the effect on the logit is .303). But this relative advantage became a relative disadvantage for males born after 1965 (the coefficient is .303–.801). It should be noted that Model 1 provides no evidence that females in the later cohorts obtained a gender-specific advantage from their mothers' education. The estimated effect of the three-way interaction is positive (.221), but smaller than its standard error.

Model 2 includes all two- and three-way interactions involving father status, gender, and cohort, and further includes all interactions involving age, gender, and cohort. The results for Model 2 are presented in standard log linear contrasts (i.e., the effects from each set of contrasts are constrained to total 0). This model has virtually the same substantive implications as Model 1. There is strong evidence of a structural shift in the gender-specific effects of parents' education on the educational attainment of their same-sex children. The effect of the interaction between father having some college education, gender, and cohort (.242) is statistically significant, indicating that the salience of fathers' college education for their sons' likelihood of college completion increased in later cohorts.<sup>10</sup> The three-way interaction coefficients involving father further imply that the most important change over time concerns the contrast between having a father who went to college and having either a high school-educated father or no father in the household. Contrasts between the presence of a father in the household and the presence of either a high school-

<sup>10</sup> We tested different cut points, including 1964/1965 and 1966/1967, and also estimated a specification that included an interaction between father, gender, and cohort specified as the birth year. The finding of a structural shift in the gender-specific effects of father's education on the probability of college completion is robust to the particular way that cohort is specified.

**Table 2.** Logistic Regression Coefficients, College Completion for Whites 25–34 Years Old, GSS Survey Years 1972–2002

	Model 1		Model 2	
	Dummy Variable Contrasts		Log-linear Contrasts	
	$\beta$	(SE)	$\beta$	(SE)
Birth Cohort 1966+ (vs. 1938–1965)	.318	(.285)	–.226	(.381)
Female	–.136	(.133)	.682	(.381)
Later Cohorts $\times$ Female	–.107	(.272)	.733	(.381)
Mother Some College	.737**	(.134)	.447**	(.056)
Later Cohorts $\times$ Mother Some College	.079	(.218)	.050	(.037)
No Father Present	–.031	(.129)	–.009	(.116)
Father Some College	1.285**	(.113)	1.237**	(.083)
Later Cohorts $\times$ No Father	–.107	(.226)	–.036	(.114)
Later Cohorts $\times$ Father Some College	–.390	(.211)	.023	(.082)
Mother Some College $\times$ Female	.120	(.147)	.058	(.037)
No Father Present $\times$ Female			–.069	(.112)
Father Some College $\times$ Female			–.088	(.081)
Mother Some College $\times$ No Father	.108	(.208)	.058	(.104)
Mother Some College $\times$ Father Some College	.150	(.138)	.077	(.069)
No Father or Father $\leq$ HS $\times$ Male	.303*	(.143)		
No Father or Father $\leq$ HS $\times$ Male $\times$ Later Cohorts	–.801**	(.293)		
Mother Some College $\times$ Female $\times$ Later Cohorts	.221	(.295)	.029	(.037)
No Father $\times$ Female $\times$ Later Cohorts			–.087	(.112)
Father Some College $\times$ Male $\times$ Later Cohorts			.242**	(.081)
Age Main Effects	(omitted)		(included)	
2- and 3-way Interactions between Age and (Gender, Cohort)	(omitted)		(included)	
Constant	1.695**	(.140)	1.969**	(.382)
N	7,024		7,024	
df	15		21	

Note: Dummy variable effects are contrasts against the omitted reference category. Log linear effects sum to zero over the categories of the variable. GSS = General Social Surveys; Later Cohorts = Birth Cohort 1966+; SE = robust standard error;  $\leq$ HS = high school or less.

\*  $p \leq .05$ ; \*\*  $p \leq .01$  (two-tailed tests).

or college-educated father did not change significantly over time.

In the absence of a structural shift, the gender egalitarianism observed during the first period would have created a female-favorable trend in college completion. In other words, in the earlier period, the most gender-egalitarian families were those with the most educated parents. As overall education rises, this pattern would spread, representing a change in the composition of American families. However, this change alone would be insufficient to account for the gender reversal in educational attainment. The extent of change attributable to this

type of compositional shift is demonstrated via a simulation based on Model 2 in Table 2 that compares the experiences of GSS respondents born between 1940 and 1945 with those born between 1970 and 1975 (complete simulation results available from the authors). If nothing changed between these two sets of cohorts except the distribution of families with a father present and the distribution of parental education, the coefficients for the early cohort model would have implied a reduction in the male-female gap in college completion, from 6.3 percentage points in favor of men (27.3 percent for men vs. 21.0 percent for women) to 4.4

**Table 3.** Actual versus Predicted Change in Proportion Completing College

Parental Status	Gender	Period Change		Female Gain Relative to Male Gain		
		Actual	Predicted	Actual	Predicted	Discrepancy
Mother Education: ≤HS						
No father at age 16	Male	-.056	-.036	.052	.054	-.003
	Female	-.004	.019			
Father education: ≤HS	Male	-.071	-.036	.094	.056	.038
	Female	.024	.020			
Father education: Some College	Male	-.028	-.061	.018	.096	-.078
	Female	-.010	.036			
Mother Education: Some College						
No father at age 16	Male	-.090	-.054	.160	.088	.072
	Female	.070	.034			
Father education: ≤HS	Male	-.116	-.052	.285	.085	.199
	Female	.169	.033			
Father education: Some College	Male	.013	-.066	-.008	.102	-.110
	Female	.005	.036			

*Note:* Table reports actual change in proportion completing college versus predicted change from a model that assumes that the female-favorable trend is the same for everyone regardless of family background; ≤HS = high school or less.

percentage points in favor of men (38.0 percent for men vs. 33.6 percent for women). Thus, although these compositional shifts would have narrowed the male advantage in education, they would have been insufficient to produce a female advantage.

The emergence of a female advantage in education is attributable to a reversal in the gender-specific effects of father status. Even as the gender egalitarianism of college-educated parents remained essentially stable across the post-war decades covered by the GSS data, the disadvantage for sons of high school-educated fathers grew relative to that for daughters. This growing disadvantage constituted a reversal from the pattern at midcentury, when the rate of return to father's college education was higher for daughters than for sons, to the pattern of the current period, when the rate of return to father's college education is higher for sons than for daughters.

The results in Table 2 demonstrate that changes in the gender gap in college completion vary by family background, but they do not show the substantive magnitude of this variation. To show this magnitude, we compare the actual changes in the proportion of men and women completing college with the predicted changes from a model that assumes a homogeneous rate of change regardless of family

background.<sup>11</sup> In Table 3, the predictions from this model of homogeneous change are compared with the actual proportions of respondents who completed college in Columns 1 and 2. By differencing the female and male changes, we obtained the actual and predicted female gain relative to the male gain in college completion, which are reported in Columns 3 and 4. Column 5 reports the discrepancy between the actual relative change and the relative change predicted by the model of homogeneous change. Column 5 shows a substantively large discrepancy (a difference of .199 in the proportion completing college) between the actual female gain in college completion and the gain predicted from the model of homogeneous change when father had a high school education or less. The actual gap is smaller than the predicted gap from the baseline model whenever father was present and had a college education. Thus,

<sup>11</sup> To obtain the baseline, we estimated a logit model for the probability of college completion as a function of age, gender, father's education or no father present, mother's education, and cohort. This model contained interaction effects between gender and father's education, gender and mother's education, and gender and cohort group, but included no other interaction effects involving cohort group.

the gender gap in college completion has emerged unevenly across different family background groups.<sup>12</sup>

In summary, we find no strong evidence that the female-favorable trend in college is being driven by compositional changes in the family situation that would give women a specific advantage over men in the educational attainment process. The gender-egalitarian hypothesis provides an accurate description of outcomes for cohorts born at midcentury, but the trend prediction from this hypothesis is wrong. In families with parents who both are college educated, male and female college completion rates are high and roughly constant throughout the observation period. But in families with fathers who are absent or have low levels of education, there has been a shift from a male advantage in the earlier period to a female advantage in the later period. Nor do the results support the gender-role socialization perspective, which predicts a larger or growing impact of maternal status on daughters, as compared with sons. Rather, most of the shift stems from the growing vulnerability of boys who are sons of high school-educated or absent fathers. Clearly, the female-favorable trend in college completion emerged unevenly, and its development varies by family of origin status. As we show in the following discussion, these trends have produced a contemporary situation in which women typically have equal or higher rates of college completion than men across a range of family types.

<sup>12</sup> Our results differ from those of Kalmijn (1994), who concluded that mothers' and fathers' statuses influence sons' and daughters' educational attainment equally. We find that a *shift* has taken place in the interaction between gender and parental status, which implies a *three-way* interaction between parental variables, gender, and cohort. Kalmijn focused on significance of *two-way* interaction effects between parental status and gender. Other important differences are that Kalmijn's data lack birth cohorts born after 1960 and he restricted the sample to respondents in two-parent families and to those who provided information about their father's education and occupation (data more likely to be missing when father absent during childhood).

## GENDERED PATHWAYS TO COLLEGE COMPLETION: ANALYSIS OF NELS DATA

The GSS data can be used to identify trends, but they lack the detailed information needed to uncover the factors that explain the contemporary female advantage in college completion. To determine the source of this advantage and its link to family background and school performance, we analyze data from NELS for a sample of cohorts born in 1973 or 1974.<sup>13</sup> In NELS, information on background and educational experiences is provided through the year 2000 for a nationally representative sample of youth in eighth grade in 1988.

We first examine the same relationships among parents' education, family structure, and college completion with the NELS data that we examined with the GSS data. Then, in an attempt to establish how the female advantage in college completion arises, we investigate both family background and academic-related sources of the gender gap in recent years. Specifically, we take a thorough account of potential gender differences in high school academic performance, the rigor of the high school curriculum, time use, educational expectations, and potentially problematic behaviors that may influence subsequent college enrollment and completion. Appendix B lists all the variables included in the analyses to account for these factors.

After we determine the impact of gender differences in high school behaviors on college enrollment, we assess the role of community college as an indirect route to 4-year college completion as a source of the female advantage. Finally, we examine gender differences in academic performance and the choice of a major in college and assess their role in producing the gender gap in 4-year college completion.

<sup>13</sup> Because NELS was a study of eighth graders in 1988, the great majority of NELS respondents were born in these years, but 6 percent of the sample was born in 1972 or earlier.

**FAMILY BACKGROUND AND COLLEGE COMPLETION: COMPARISON OF NELS AND GSS COHORTS**

We first examine the relationship between parents' education, family structure, and rates of male and female college completion for the NELS sample and compare these results with those obtained with the GSS sample. Because the NELS sample is considerably larger than the corresponding GSS sample, we also are able to analyze these relationships for blacks and compare the patterns of association between family background and college completion for blacks and whites.

These results for the NELS white sample (Table 4, Panel A) are similar to those for the Period 2 GSS sample (Table 1, Panel B) in showing that females have moved ahead of males in families wherein they once lagged considerably behind—families with low-educated or absent fathers. As a further check on the consistency of this finding in the two data sets, we substituted the NELS data for the second-period GSS data. The trend results found between the first- and second-period GSS data are reproduced when we substitute the NELS data for the second-period GSS data (see details in our Online Supplement on *ASR* Web site: <http://www2.asanet.org/journals/asr/2006/toc052.html>). The NELS data were collected at a later point in history than most of the data shown in Panel B of Table 1. The NELS sam-

ple consists of cohorts born in 1973–1974, toward the end of the years covered by the GSS cohorts (1966–1977). This may explain why the growth in a female advantage in some family types that we observe between Panels A and B in Table 1 appears to have spread to other family types for the birth cohorts of the mid-1970s.

Table 4, Panel B, shows the results for black NELS sample members. The pattern for blacks is similar to that for whites, except that the gender gaps favoring females are even larger for blacks. Table 5 reports tests for associations involving race, gender, parental variables, and college outcomes when the data in Panels A and B of Table 4 are analyzed jointly. The large significant association between race and college completion indicates that blacks have lower rates of college completion than whites. The significant three-way association between gender, race, and college completion indicates that black males have lower college completion rates relative to females than white males. The advantage of having a college-educated mother is greater for whites than for blacks, as indicated by the significant three-way association between mother's education, race, and college completion. The significant four-way association between father's status, gender, race, and college completion indicates that the advantage of having a college-educated father for males relative to females is greater for blacks than for whites. As we shall see later, the inclusion of addition-

**Table 4.** College Completion Rates by Parents' Education and Family Structure, NELS 1988–2000

Mother's Education		Father's Education					
		High school or less		Some college or more		Father not present	
		Male	Female	Male	Female	Male	Female
<b>A. Whites</b>							
High school or less	%	13.8	17.2	32.7	37.0	8.8	14.8
	N	978	1,096	383	416	200	255
Some college or more	%	25.6	34.6	56.8	63.7	26.4	44.4
	N	238	283	1,132	1,180	194	196
<b>B. Blacks</b>							
High school or less	%	4.3	21.9	15.7	21.7	5.0	15.4
	N	89	109	23	25	57	133
Some college or more	%	9.2	22.8	37.4	44.1	10.8	25.9
	N	26	32	80	84	54	73

Source: Authors' calculations from 1988–2000 National Education Longitudinal Study data.

Note: Table shows percent of males and females who have completed college. NELS = National Educational Longitudinal Survey.

**Table 5.** Tests of Associations Involving Race, Gender, Parental Variables, and College Completion

Interactions	Wald $\chi^2$	df	$p > \chi^2$
Race $\times$ College Completion	43.38	1	.000
Female			
$\times$ College Completion	50.08	1	.000
$\times$ Race $\times$ College Completion	8.27	1	.004
Mother Education			
$\times$ College Completion	72.06	1	.000
$\times$ Father Education/Present $\times$ College Completion	8.04	2	.018
$\times$ Father Education/Present $\times$ Race $\times$ College Completion	2.71	2	.258
$\times$ Race $\times$ College Completion	4.02	1	.045
Father Education/Present			
$\times$ College Completion	119.65	2	.000
$\times$ Female $\times$ College Completion	11.59	2	.003
$\times$ Female $\times$ Race $\times$ College Completion	6.53	2	.038
$\times$ Race $\times$ College Completion	.13	2	.937

al NELS88 covariates in more complex models mediated most of the effects of parental variables on college outcomes, and their inclusion caused most interaction effects involving race to become insignificant. Although we include the white, black, and other minority samples in the analyses that follow, we report only interaction effects involving race when they are statistically significant or useful for interpretation. Otherwise, we exclude them from the tables.

#### **ACADEMIC PERFORMANCE, EDUCATIONAL TRANSITIONS, AND THE CONTEMPORARY GENDER GAP**

To establish how the female advantage in higher education arises, we analyze the relationship between gender and achievement outcomes at different points in the educational career. Table 6 provides an overview of the results to follow by showing the relationship between gender, postsecondary enrollment, 4-year college enrollment, and 4-year college completion. The top panel reports logistic regression coefficients, and the bottom panel reports proportions of females and males who attained each outcome. Table 6 presents the surprising result that the gender gap in college completion actually arises very late in the educational career for NELS respondents. Although females are significantly more likely to enroll in postsecondary education, they are no more likely than males to enroll in a 4-year college.<sup>14</sup> From a statistical

perspective, the entire female advantage arises from the probability of completing a 4-year college course, given that one enrolls in a 4-year college.<sup>15</sup> This need not mean that girls have no advantage over boys earlier in the educational career. Rather, whatever advantage they have does not express itself until this final educational transition.

Although female students had no advantage over male students in rates of college enrollment, the results in Table 6 represent an historical advance for women, in that females used to be significantly less likely than males to enroll in college. For example, Alexander and Eckland (1974) showed that despite female advantages in academic performance in high school, females from the high school class of 1972 were less likely to enroll in college than males. In results not shown, we established that female NELS respondents had significantly higher academic performance in eighth grade and high school than their male counterparts. Table 7 shows the implications of the better academic performance of females for college enrollment, conditional on the completion of high school. Model 1 underscores the point that despite their

gap favoring females has emerged for 4-year college enrollment. In the fall of 2002, females comprised 55.5 percent of all students enrolling in 4-year colleges (U.S. Department of Education 2004, table 176).

<sup>15</sup> Column 2 reports results based on the full sample. The results are very similar if the sample is restricted to students who received a high school diploma or a GED.

<sup>14</sup> Note that in the 15 years since NELS respondents were at risk for enrolling in college, a gender

**Table 6.** Logistic Regression Coefficients, Post-Secondary Enrollment, 4-Year College Enrollment and 4-Year College Completion, NELS 1988–2000

	Model 1	Model 2	Model 3	Model 4	Model 5
	Post-Secondary Enrollment	4YC Enrollment	4YC Completion	4YC Completion, given 4YC Enrollment	4YC Completion, given 4YC only Enrollment
Female	.219** (.077)	.037 (.061)	.234** (.059)	.368** (.079)	.454** (.105)
Constant	1.151** (.059)	.055 (.046)	-.934** (.044)	.207** (.567)	.740** (.077)
N	10,820	10,759	10,729	6,014	3,512
	Proportion	Proportion	Proportion	Proportion	Proportion
Female	.80 [5,771]	.52 [5,771]	.33 [5,771]	.63 [3,281]	.75 [1,900]
Male	.76 [5,056]	.51 [5,056]	.28 [5,056]	.55 [2,845]	.67 [1,693]

*Note:* Data shown as coefficients (robust standard errors are in parentheses); the N for frequencies are in brackets. First three models are for the full sample, model 4 limits sample to those who ever enrolled in a 4-year college, model 5 limits sample to those who only enrolled in 4-year college. 4YC = 4 year college; NELS = National Educational Longitudinal Survey.

\*\*  $p \leq .01$  (two-tailed tests).

better performance in high school, females have no net advantage in 4-year college enrollment. Model 2 introduces controls for family background and interaction effects between gender and race. This model shows the expected positive effects of parental education on college enrollment. There is no significant female advantage in college enrollment for any of the three racial groups, although the point estimate for the interaction effect between black and female is consistent with other data (e.g., U.S. Department of Education 2004, Table 206) in suggesting that black females had an enrollment advantage over black males in the early 1990s. Column 3 includes controls for high school class rank, the rigor of the high school curriculum, and the full set of academic and nonacademic behaviors described in Appendix B. The results confirm that grades, curriculum, and behaviors in high school are important predictors of the probability of 4-year college enrollment. It should be noted that net of these factors, females actually have a slight disadvantage in college enrollment according to the point estimates. Comparing the female coefficients in Models 1 and 3, we see that the female

advantage in grades and other behaviors erases the small female disadvantage that exists net of these factors, and brings females to the parity with males in 4-year college enrollment that we saw in Table 6.

We next examine the impact of gender differences in community college enrollment and in the rate of transition from community college to 4-year college on college completion for NELS respondents. We conduct a decomposition analysis that maps out the probability of college completion into the conditional probability of the various pathways that lead to this outcome, some of which involve enrolling in community college. Because we are interested in the college completion gap for the entire cohort, we do not condition on high school completion when we estimate these probabilities because this would cause gender differences in high school completion to be omitted from the calculation. We call all non-4-year postsecondary education “2-year” college. It follows that there are three types of postsecondary attendance: (a) 4-year college attendance only, (b) 2-year



**Table 7.** Logistic Coefficients for 4-year College Enrollment, given High School Diploma or Equivalent, NELS 1988–2000

	Model 1		Model 2		Model 3	
	$\beta$	(SE)	$\beta$	(SE)	$\beta$	(SE)
Female	.061	(.065)	.076	(.073)	-.155	(.117)
Race (white = ref.)						
Black	-.465**	(.141)	-.410	(.240)	-.255	(.241)
Other	-.385**	(.078)	-.065	(.137)	-.460**	(.137)
Female $\times$ Black	—		.427	(.313)	not included	(NS)
Female $\times$ Other Race	—		-.148	(.185)	not included	(NS)
Mother Some College	—		.827**	(.079)	.542**	(.120)
Father Some College	—		1.151**	(.084)	.695**	(.121)
Father Present	—		-.055	(.110)	.042	(.184)
Controls for						
High school						
academic performance						
Missing	—		—		-.847**	(.237)
2nd quintile	—		—		-.334	(.188)
3rd quintile	—		—		-.626**	(.159)
4th quintile	—		—		-1.154**	(.194)
Lowest quintile	—		—		-1.838**	(.221)
Academic intensity						
Missing	—		—		-1.426**	(.492)
2nd quintile	—		—		-.565**	(.219)
3rd quintile	—		—		-1.261**	(.205)
4th quintile	—		—		-1.585**	(.208)
Lowest quintile	—		—		-1.838**	(.221)
Ever in AP course	—		—		.289**	(.114)
Average grade in English	—		—		-.003	(.007)
Average grade in Math	—		—		-.003	(.007)
Ever in fight	—		—		-.212	(.163)
Constant	.426**	(.046)	-.415**	(.109)	1.896*	(.863)
N	9,913		8,314		6,669	
df	1		8		67	

*Note:* The top quintile is the reference category for High School academic performance and Academic intensity. Model 3 includes additional controls for high school academic performance (12th grade standardized test scores in reading, math, science, and social studies; grades in science and social studies), curriculum (ever attended remedial math or English class), and behaviors (number of times skipped school, ever in trouble in school, hours of homework done per week, hours worked during school, hours of TV watched on weekdays, frequency of coming to class without pencil, books or paper) and educational expectations in 12th grade. See Appendix B for details. AP = advanced placement; SE = robust standard error; NS = not statistically significant; NELS = National Educational Longitudinal Survey.

\*  $p \leq .05$ ; \*\*  $p \leq .01$  (two-tailed tests).

college attendance only, and (c) attendance in some combination of 2- and 4-year college.<sup>16</sup>

In addition to showing the results of this

decomposition, Table 8 reports useful statistics about the postsecondary attendance patterns of males and females. Column 1 shows that 28 percent of men and 33 percent of women com-

<sup>16</sup> We do not distinguish here between those who started 2-year college, then made a single transition to 4-year college and the numerous other paths that could lead a student between these two groups of edu-

cational institutions. As is shown later, such finer distinctions are unnecessary for understanding the gender difference in 4-year college completion rates.

pleted 4-year college; 47 percent of men and 50 percent of women attended 2-year college; transfers between 2- and 4-year college were common; 48 percent of men and 46 percent of women who attended 2-year college also attended 4-year college. Only 29 percent of men and women exclusively attended 4-year college. It can be seen that the rates of college completion are significantly higher for males and females who attended only 4-year college (68 and 77 percent, respectively) than for those who attended 2- and 4-year college (39 and 47 percent, respectively), and that for both types of attendance, higher percentages of females than males complete college.

To determine whether gender differences in 2-year college attendance rates and in transition rates from 2- to 4-year college can explain the female advantage in college completion, we successively assigned to males the female probability for each pathway to college completion. We further elaborated the decomposition to show the impact of gender differences in college-level academic performance. To do this, we estimated a simple model for college completion that contained only gender and grades, and used this to determine the proportion of the female advantage resulting from higher college grades and the proportion not explained by grades. The decomposition allows us to determine the impact that each of these components has on the total difference (.051) between the female and male rates of college completion.

The female advantage in 2-year college attendance has only a small impact on the female

advantage in 4-year college completion. The gender gap would diminish by only 12.7 percent if men attended 2-year college at the same rate as women. Because among 2-year college attendees, males are more likely than females to transition to 4-year college given 2-year college attendance, the explained portion of the gap would shrink to 6.4 percent if males had the female rate of transition between 2- and 4-year college. But males in this population have lower college grades than females, and this shortfall produces a substantial 32.8 percent of the gender gap, leaving only an additional 6.3 percent of the gap to be explained by advantages among 2- and 4-year attendees that are not associated with females' higher grades. Females were no more likely than males to enroll *only* in 4-year college, but the gender gap in college performance for these students plays a major role, explaining another 44.8 percent of the gender gap in college completion. The remaining 6.5 percent of the gap could be attributed to female advantages among the population of 4-year only attendees that are not associated with college grades. This decomposition makes it clear that 2-year colleges play a potentially major role in the overall proportion of men and women who finish 4-year college, but that their role in producing the female advantage in college completion is small.

Considering the importance of academic performance in explaining the college completion gap, Table 9 explores the determinants of college performance in greater detail. Model 1, which controls only for race and family back-

**Table 8.** Decomposition of Gender Gap in College Completion through Various Pathways, NELS 1988–2000

Probability of:	BA	2YCA	4YCA, Given 2YCA	BA, Given 4YCA and 2YCA	4YCA Only	BA, Given Only 4YCA		
Male	.28	.47	.48	.39	—	.29	.68	—
Males Estimated with Female Grade Distribution	—	—	—	.46	.46	—	.76	.76
Female	.33	.50	.46	—	.47	.29	—	.77
Gender Gap	.051							
Percent of Total Gap Eliminated if Each Transition Rate Were Equalized								
Unique effects	—	12.7%	–6.3%	32.8%	6.3%	3.2%	44.8%	6.5%
Cumulative effects	—	12.7%	6.4%	39.2%	45.5%	48.7%	93.5%	100.0%

Note: BA = Bachelor's degree; 2YCA = 2-year college attendance; 4YCA = 4-year college attendance; NELS = National Educational Longitudinal Survey.

**Table 9.** OLS Regression Coefficients for College Academic Performance (GPA), NELS 1988–2000

	Model 1		Model 2	
	Coefficient	(SE)	Coefficient	(SE)
Female	.263**	(.026)	.100**	(.025)
Race (white = ref.)				
Black	-.443**	(.076)	-.254**	(.070)
Other	.001	(.053)	.006	(.051)
Female × Black	-.120	(.144)	.029	(.085)
Female × Other Race	-.145*	(.071)	-.091	(.065)
Mother Some College	.147**	(.034)	.021	(.026)
Father Some College	.149**	(.035)	.084**	(.027)
Father Present	.058	(.060)	.003	(.039)
High School and College-Level Controls	no		yes	
Constant	2.425**	(.060)	3.296**	(.507)
N	5,032		4,249	
df	8		87	

*Note:* Model 2 includes controls for all high school performance, curriculum and behaviors and college-level indicators detailed in Appendix B. SE = robust standard error; GPA = grade point average; NELS = National Educational Longitudinal Survey.

\*  $p \leq .05$ ; \*\*  $p \leq .01$  (two-tailed tests).

ground, provides evidence that the female advantage in college academic performance varies by race, with the coefficient for whites about twice as large as the coefficient for non-whites. In line with prior research (Kao and Thompson 2003), our results indicate that blacks get significantly lower grades in college. Model 2 indicates that adding a comprehensive set of controls (for high school class rank, high school curriculum, educational expectations, and other behaviors during high school, as well as for college major, college type, and college selectivity) reduces the female advantage in college grade point average (GPA) to a .1 advantage on a 4.0 scale. Although small, this advantage remains statistically significant. It should be noted that the interaction effect between female and other race suggests that this gender difference does not exist for other minorities net of the other variables in Model 2.

Finally, we examine in Table 10 how the racial differences in the female advantage in college completion are mediated by college type, college major, and college grades for the sample of those who ever enrolled in 4-year college.<sup>17</sup>

<sup>17</sup> We conducted the same analyses for the sample that enrolled only in 4-year college, and the pattern of results was very similar.

Panel A reports the female coefficient from a model that contains the main effects for race and includes the covariates indicated in the table. Panel B reports the race-specific female coefficients. For each model, we also report the percentage of the female coefficient that remains to be explained, net of the additional coefficients.

The results in Panel A demonstrate that the female advantage over males is largely attributable to the superior performance of women in college (e.g., 70 – 5 percent = 65 percent). Panel B suggests that blacks and other minorities differ from whites in that a smaller proportion of the female advantage comes from gender differences in performance (e.g., 19 and 48 percent, respectively). For blacks, more of the female advantage appears to be linked with gender differences in type of college and college majors selected. For other minorities, a relatively large fraction of the female advantage in college completion rates is unexplained by college type, college major, or performance. In short, the simple story that women graduate in higher numbers because they do better in college is largely a story about white women. For blacks and other minorities, more research is needed

**Table 10.** Logistic Regression Coefficients for College Completion, NELS 1988–2000

	Model 1	Model 2	Model 3	Model 4
<b>Panel A. Main Effect Of Female Only</b>				
Female	.479** (.089)	.335** (.128)	.025 (.130)	-.005 (.130)
Percent of coefficient in column 1	100%	70%	5%	-1%
<b>Panel B. Race-Specific Female Effects</b>				
White female	.419** (.098)	.295* (.144)	-.046 (.146)	-.075 (.145)
Percent of coefficient in column 1	100%	70%	-11%	-18%
Black female	1.015** (.387)	.507 (.426)	.319 (.468)	.303 (.472)
Percent of coefficient in column 1	100%	50%	31%	28%
Other female	.429* (.199)	.487 (.254)	.284 (.249)	.236 (.252)
Percent of coefficient in column 1	100%	114%	66%	55%
<b>Included Covariates</b>				
Social background	yes	yes	yes	yes
College attributes		yes	yes	yes
College GPA			yes	yes
College GPA × major				yes

*Note:* Data shown as coefficients (robust standard errors are in parentheses). Social Background covariates include mother some college, father some college, father present; College Attribute covariates include college type, selectivity and major. GPA = grade point average; NELS = National Educational Longitudinal Survey.

\*  $p \leq .05$ ; \*\*  $p \leq .01$  (two-tailed tests).

to establish more clearly how the female advantage arises.

#### **GENDER-SPECIFIC FAMILY BACKGROUND EFFECTS**

As seen earlier, Table 1 demonstrates that the female disadvantage in college completion experienced by the cohorts from the middle of the 20th century existed mainly in the households of families who were not college educated, and that the major change which occurred was that girls in these households caught up with their brothers and surpassed them. This significant change in the effects of family background over time produced a situation for the NELS cohorts in which the female advantage remained largest in families with absent or high school-educated fathers, but extended to all family types. In our multivariate analyses, we tested for the gender-specific advantages of family background for both academic performance and the rate of transition between education levels net of performance. Because of the many models

involved, we summarize only the conclusions of our analyses.

First, we found no statistically significant gender-specific effects of family background on academic performance in eighth grade, high school, or college. Rather the gender-specific effects of family background involved educational transitions net of performance and other covariates. In the analysis of college enrollment, we found that father's education is more important for sons' than for daughters' college enrollment. In the analysis of college completion, given enrollment, we found evidence of gender differences in the effects from the absence of a father. Among those who enroll only in 4-year colleges, the absence of a father is associated with a reduced likelihood of college completion for males, but not for females. This pattern is found in the model that controls only for race and family background, and it persists in a model that adds controls for college type, college major, and academic performance. These findings are consistent with the pattern shown in the GSS data, indicating that

fathers' education and fathers' absence have become more important for the educational attainment of sons than for the educational attainment of daughters in more recent cohorts. In summary, the gender-specific effects of father's status have their primary impact on the likelihood of the transition into 4-year college and college completion, given enrollment, rather than on academic performance. Although gender differences in college academic performance play a larger role than gender differences in educational transitions in explaining the female advantage in college completion, gender-specific differences in family background also contribute to the contemporary gender gap via their impact on educational transitions.

## DISCUSSION

This article provides clear evidence of the trend toward rising rates of female college completion over time in the United States. The gender gap in college enrollment and completion favoring males has closed, so that in recent cohorts, females' odds of college completion substantially exceed those for males. Our investigation of trend data shows that the white female advantage in college completion is largely attributable to a declining rate of college completion among boys whose fathers were high school educated or absent. This pattern is inconsistent with either a gender-egalitarian or gender-role socialization argument. The gender-egalitarian hypothesis attributes the female-favorable trend in college completion to rising average levels of parental education. We observed a pattern in line with this argument for early cohorts, and we found that the gender egalitarianism of college-educated parents was essentially stable across the postwar decades. However, the trend implications of the gender-egalitarian hypothesis fail because of the declining likelihood of college completion for males with absent or low-educated fathers relative to similarly situated females. Gender-role socialization perspectives predict that compositional shifts in maternal education or employment rates could produce female-favorable trends in higher education if these changes had a greater impact on daughters than sons. Additionally, structural shifts may arise via a growing importance of mother's education for daughter's educational attainment. The data do not provide strong support for either

conjecture. Instead, most of the shift stems from a different gender-distinctive pattern, namely, the growing vulnerability of boys in families with low-educated or absent fathers. These boys were increasingly disadvantaged in educational attainment.

Why would the probability of college completion drop over time for sons in families with a high school-educated or absent father, even as the probability rose for daughters in these families? Furthermore, why have daughters continued to surge ahead in their academic attainment and thereby push past boys almost regardless of family type? With respect to the latter question, it is now clear that the proximate cause of the female overtaking is found in gender differences in behavior during 4-year college. For white students, superior academic performance in college rather than gender segregation by college type or major is the primary cause of the female advantage in college completion. The roots of the female advantage in academic performance, of course, lie much earlier in the educational career. It should be noted that the consequences of the female performance advantage are relatively minor for high school completion or the transition to college. Only after enrollment in 4-year college is the female advantage in academic performance converted into a solid female advantage in educational attainment.

For minority students, the story may be more complicated. The female advantage in college performance appears to be weaker for nonwhite students than for white students, and other unidentified factors may play a stronger role. Clearly, more research is needed to elucidate the source of their advantage in college completion.

Our analyses imply that the male disadvantage in college completion originates in part from gender-distinctive effects of family background. The data show that males, especially black males, gain a differential advantage when they have a father in the home with some college education, and that they lose this advantage when their father has only a high school education or is absent (Table 4). The GSS data make it clear that this gender-distinctive pattern emerged gradually during the postwar years. Explanations for why this pattern emerged are suggested by our analyses, but cannot be subjected to a definitive test. For example, one potential source of this trend that cannot be

tested with the available data is a cultural shift in factors of family life that are linked to father's education. Back in 1940, a high school-educated father was rather high in the educational hierarchy of the American adult population, in which, according to the GSS data, fewer than 20 percent of fathers had some college education. Many of these fathers were first- or second-generation immigrants who, by many accounts, had a strong mobility orientation for their children (Hirschman 1983). In contrast, high school-educated fathers of the most recent cohorts are lower in the educational hierarchy and may differ in their mobility orientation from their counterparts from the 1940s. It should be noted, however, that research on whether value differences can explain differences in achievement across racial and ethnic groups has typically found at best a weak impact (Featherman 1971; Kao and Thompson 2003; Rosen 1959). These research findings do not apply directly to the current case, which concerns the extent to which a particular level of parental education has a changing gender-specific impact on achievement in the next generation. However, they do point to the importance of considering structural factors as possible explanations for the trend.

Another explanation for the growing female advantage concerns gender-specific trends in academic achievement. It clearly is the case that girls generally outperform boys in school. But this is not a new phenomenon; it was in evidence at least back to the 1950s. What appears to be new is the *consequence* of this superior performance for educational attainment. In earlier cohorts, boys went farther in school than did comparably performing girls. In a sense, this remained true in the NELS data. As seen earlier in Table 7, the point estimate for the female coefficient in the model for college enrollment was negative after control variables were included in the model. However, it was not *so* negative as to offset the female advantage in academic performance and other social behaviors (e.g., a lower tendency to get into fights). Consequently, the rates of enrollment in 4-year college were roughly equivalent, and the female advantage in academic performance combined with other factors to produce a female advantage in college completion. Why then has this change been taking place?

We believe that the change stems from a combination of declining gender discrimination and women's growing interest in possessing autonomous resources by which they can pursue opportunities in both the labor and marriage markets while protecting themselves against adversity in both realms. In previous research, we have shown that the total value of college (including its value in the labor and marriage markets) has risen faster for females than for males (DiPrete and Buchmann 2006). Furthermore, a rising divorce rate into the early 1980s coupled with greater postdivorce child care responsibilities for women raised the importance of college education as insurance against falling below a middle-class standard of living more for women than for men.

It is unlikely that such a rationalist explanation would account for gender trends in test scores, which arise at an age when children are relatively ignorant about labor or marriage markets. However, the current study provides indirect support for the hypothesis that trends in the total value of college play a material role in the emergence of the new gender gap. Much of the female advantage in college completion comes from gender-specific behaviors of young adults older than 18 years of age. That these differences in behavior occur in late adolescence and early adulthood is at least consistent with the argument that they are being driven by calculations about the value of college for adult life. The combination of evidence that overt gender discrimination in American society has decreased, that the relative value of higher education for women has increased, and that females have a long-standing advantage over males in academic performance can explain the unexpected reversal of a gender gap in college completion that once favored males to one that now favors females.

The unexpected trend contains a certain irony. Although the value of a college education has not risen as fast for men as for women, DiPrete and Buchmann (2006) show that these returns have indeed risen for men. The returns to education in the labor market have risen for men. The earnings value of a spouse to men has risen as female earnings have risen. Finally, the financial vulnerability of men to divorce has risen (McManus and DiPrete 2001). Arguably, one puzzling aspect of the reversal of the gender gap in college completion is the slow pace of growth

in men's rates of college completion. Our research suggests a socialization-based disadvantage for males that is relatively stronger in families with low-educated or absent fathers. But whether this disadvantage plays out through a lack of knowledge about the value of post-secondary education and the way to convert it to success in the labor market, or through a lower priority placed on education relative to other perhaps short-term goals, or through some other mechanism is not yet clear.

Recent statistics from the U.S. Department of Education (2004) indicate that the female-favorable gender gap in higher education has continued to widen in the 15 years since the NELS sample was at risk for enrolling in college. Currently, women are more likely than men to enroll in 4-year college, earn a bachelor's degree, and enroll in graduate school. The fact that a similar trend exists in many industrialized countries suggests that there may be a common cause for the female-favorable trend in college completion. Declining discrimination and growing gender egalitarianism may combine with women's growing determination for educational and labor market achievement throughout the industrialized world. The increasing availability of internationally comparative data on intergenerational mobility for men and women should make it possible to establish whether the growing female advantage in other countries has been expressed via the same reversal in intergenerational association that we have found in the United States. Future research also could establish whether the female advantage emerges largely at the last educational transition, as in the United States, or whether females in other countries have growing advantages over males at earlier educational transitions as well. Finally, a comparative approach makes possible a more rigorous assessment of the effects from macrolevel factors, which may change at different rates in different countries. The growing female advantage in college completion may have profound impacts on society that are only beginning to be appreciated. Both the causes and consequences of this trend deserve greater scrutiny.

*Claudia Buchmann is Associate Professor of Sociology at the Ohio State University. Her research interests include social stratification, education, family dynamics, race and ethnicity, and comparative sociology. Her current research focuses on race, class, and gender inequalities in higher education in the United States; institutional variations of educational systems in industrialized societies and their impact on the formation of youths' educational aspirations; and cross-national variations in achievement gaps between students of immigrant origin and native born students. In previous research, she has examined processes related to educational stratification in developing societies and the consequences of globalization and worldwide educational expansion for economic and social development.*

*Thomas A. DiPrete is Professor of Sociology and the current chair of the sociology department at Columbia University. His research interests include social stratification, demography, economic sociology, and quantitative methodology. Current and recent research projects include the comparative structure of inequality and inequality trends in European and American labor markets, the sources of variation and change in family structure in the United States and Europe, social polarization in the United States and its link with segregation in social networks along several potential dimensions of social cleavage, the development of strategies for estimating causal effects in the presence of imperfectly specified models, gender inequality in higher education, and teacher effects on educational outcomes.*

## APPENDIX A. VARIABLE DEFINITIONS FOR GSS ANALYSIS

*College completion* is assigned the value of 1 if the respondent completed at least 16 years of education.

*Age* measures the respondent's age in years.

*Father's education* and *mother's education* measure the father's and mother's years of education as reported by the respondent.

*Father some college* and *mother some college* are dichotomous variables that measure whether a respondent's father or mother has 13 or more years of education.

*Father present* is assigned a value of 1 if the father was present in the household when the respondent was 16 years of age.

**APPENDIX B.**

**Table B1.** Variable Definitions for NELS Analyses

Variable	Definition
<b>Dependent Variables</b>	
Eighth grade GPA	GPA calculated from averaged-reported grade for English, Math, Science and Social Science in 8th grade.
Top quintile of high school class	Top quintile of high school class by grade point average.
Post-secondary enrollment	Enrolled in any post-secondary education by 2000.
Four-year college enrollment	Enrollment in any 4-year college as of 2000.
College academic performance	Undergraduate grade point average.
College completion	Completion of bachelor's degree or more as of 2000.
<b>Independent Variables</b>	
Female	Sex of respondent.
Race	Self-reported race of respondent: white, black or other.
High school academic performance	High school GPA by quintile 1 = low, 5 = high.
High school class rank	Standardized reading comprehension and ability test score in 12th grade.
Reading score	Standardized problem solving, simple and complex math ability test score in 12th grade.
Math score	Standardized basic, fundamental and complex science ability test score in 12th grade.
Science score	Standardized history, citizenship and geography ability test score in 12th grade.
Social studies score	Average grade in high school English courses, standardized.
Average grade in English	Average grade in high school math courses, standardized.
Average grade in math	Average grade in high school science courses, standardized.
Average grade in science	Average grade in high school social studies courses, standardized.
Average grade in social studies	
High school curriculum	
Ever in AP course	Ever enrolled in advanced placement course.
Academic intensity	A composite measure of students' highest level of math, total math credits, total AP courses, total English credits, total foreign language courses, total science credits, total core laboratory science credits, total social science credits, and total computer science credits. For more information, see Adelman, Daniel and Berkovits (2003).
Remedial English	Ever been in a remedial English class.
Remedial math	Ever been in a remedial math class.

*(continued on next page)*



**Table B1.** (Continued)

Variable	Definition
<b>Independent Variables</b>	
High school behaviors	
Homework	Hours spent on homework per week in 12th grade.
Hours of watching TV	Number of hours of TV watched on weekdays during school year in 12th grade.
Hours of working	Number of hours usually worked each week during school year in 12th grade.
No work	Did not work during school year in 12th grade.
Skip school	Frequency of skipping school in 12th grade.
Ever in fight	Ever got into fight in first semester of 12th grade.
Ever in trouble	Ever got into trouble in first semester of 12th grade.
No books	Frequency of going to class without books in 12th grade.
No pencil/paper	Frequency of going to class without pencil/paper in 12th grade.
Educational expectations	Educational Expectations in 12th grade, 1 = not finish high school, 10 = PhD or equivalent.
Family background	
Mother Some College	Mother has some college education.
Father Some College	Father has some college education.
Father Present	Father present in household in 8th grade.
College-level indicators	
College major	Major of first degree or starting major if respondent received no college degree. Categories include: arts, basic skills, business, computer-related, education, engineering/architecture, general studies, health, humanities/social sciences, protective services, science/math, trades, other.
College type	Type of post-secondary institution attended: for profit post-secondary, 2-year, 4-year private, or 4-year public.
College selectivity	Selectivity level of post-secondary institution attended: non-selective, selective, or highly-selective.

*Note:* GPA = grade point average; AP = advanced placement; NELS = National Educational Longitudinal Survey.

## REFERENCES

- Adelman, C., B. Daniel, and I. Berkovits. 2003. *Postsecondary Attainment, Attendance, Curriculum and Performance*. U.S. Department of Education, National Center for Education Statistics. Washington, DC: U.S. Government Printing Office.
- Alexander, Karl L. and Bruce E. Eckland. 1974. "Sex Differences in the Educational Attainment Process." *American Sociological Review* 39:668–82.
- Alexander, Karl L. and Edward McDill. 1976. "Selection and Allocation within Schools: Some Causes and Consequences of Curriculum Placement." *American Sociological Review* 41:963–80.
- Alwin, Duane, Michael Braun, and Jacqueline Scott. 1992. "The Separation of Work and Family: Attitudes towards Women's Labor Force Participation in Germany, Great Britain, and the United States." *European Sociological Review* 8:13–37.
- Axinn, William G. and Arland Thornton. 2000. "The Transformation in the Meaning of Marriage." Pp. 147–65 in *The Ties that Bind: Perspectives on Marriage and Cohabitation*, edited by Linda Waite, Christine Bachrach, M. Hindin, E. Thompson, and A. Thornton. New York: Aldine de Gruyter.
- Bae, Yupin, Susan Choy, Claire Geddes, Jennifer Sable, and Thomas Snyder. 2000. *Trends in Educational Equity of Girls and Women*. U.S. Department of Education, National Center for Education Statistics. Washington, DC: U.S. Government Printing Office.
- Becker, Gary S. 1964. *Human Capital: A Theoretical and Empirical Analysis, with Special Reference to Education*. New York: Columbia University Press.
- . 1991. *A Treatise on the Family*. Cambridge, MA: Harvard University Press.
- Becker, Gary S. and Nigel Tomes. 1979. "An Equilibrium Theory of the Distribution of Household Income and Intergenerational Mobility." *Journal of Political Economy* 84:S279–88.
- Behrman, Jere R., Robert A. Pollak, and Paul Taubman. 1986. "Do Parents Favor Boys?" *International Economic Review* 27:31–52.
- Bernhardt, Annette, Martina Morris, and Mark S. Handcock. 1995. "Women's Gains or Men's Losses: A Closer Look at the Shrinking Gender Gap in Earnings." *American Journal of Sociology* 101:302–28.
- Bianchi, Suzanne M. and Lynne M. Casper. 2000. "American Families." *Population Bulletin* vol. 55 no. 4. Washington, DC: Population Reference Bureau.
- Blau, Peter M. and Otis D. Duncan. 1967. *The American Occupation Structure*. New York: John Wiley.
- Brewster, Karin and Irene Padavic. 2000. "Change in Gender Ideology, 1977–1996: The Contributions of Intracohort Change and Population Turnover." *Journal of Marriage and the Family* 62:477–87.
- Cancian, Maria and Deborah Reed. 2001. "Changes in Family Structure and Implications for Poverty and Related Policy." Pp. 69–161 in *Understanding Poverty*, edited by Sheldon H. Danziger and Robert H. Haveman. Cambridge, MA: Harvard University and Russell Sage Foundation.
- Charles, Maria and Karen Bradley. 2002. "Equal but Separate? A Cross-National Study of Sex Segregation in Higher Education." *American Sociological Review* 67:573–99.
- Cherlin, Andrew and Pamela Barnhouse Walters. 1981. "Trends in United States Men's and Women's Sex-Role Attitudes: 1972–1978." *American Sociological Review* 46:453–60.
- Cross, Theodore, ed. 1999. "Special Report: College Degree Awards: The Ominous Gender Gap in African American Higher Education." *Journal of Blacks in Higher Education* 23:6–9.
- DiPrete, Thomas A. and Claudia Buchmann. 2006. "Gender-Specific Trends in the Value of Education and the Emerging Gender Gap in College Completion." *Demography* 43:1–24.
- Downey, Douglas B. and Brian Powell. 1993. "Do Children in Single-Parent Households Fare Better Living with Same-Sex Parents?" *Journal of Marriage and the Family* 55:55–71.
- Downey, Douglas B. and Anastasia S. Vogt Yuan. 2005. "Sex Differences in School Performance during High School: Puzzling Patterns and Possible Explanations." *Sociological Quarterly* 46:299–321.
- Dryler, Helen. 1998. "Parental Role Models, Gender, and Educational Choice." *The British Journal of Sociology* 49:375–98.
- Epstein, Cynthia Fuchs. 1970. *Women's Place: Options and Limits in Professional Careers*. Berkeley, CA: University of California Press.
- Eurostat. 2002. *The Life of Women and Men in Europe: A Statistical Portrait*. Luxembourg: Eurostat.
- Featherman, David L. 1971. "The Socioeconomic Achievement of White Religio-Ethnic Subgroups: Social and Psychological Explanations." *American Sociological Review* 36:207–22.
- Fox, Mary Frank. 2001. "Women, Science, and Academia: Graduate Education and Careers." *Gender and Society* 15:654–66.
- Goldin, Claudia. 1992. "The Meaning of College in the Lives of American Women: The Past 100 Years." Working Paper No. 4099, National Bureau of Economic Research, Chicago, IL.
- . 1995. "Career and Family: College Women look to the Past." Working Paper No. 5188,

- National Bureau of Economic Research, Chicago, IL.
- Gose, B. 1997. "Liberal-Arts Colleges Ask: Where Have the Men Gone?" *Chronicle of Higher Education*, June 6, pp. A35.
- Greene, Howard and Matthew Greene. 2004. "The Widening Gender Gap: Shifting Student Demographics Will Have Significant Impact on College Admissions." *University Business* 7:27-9.
- Hauser, Robert M. and Daphne H. Kuo. 1997. "How Does Size of Sibship Matter: Family Configuration and Family Effects on Educational Attainment." *Social Science Research* 26:69-94.
- Hedges, Larry V. and Amy Nowell. 1995. "Sex Differences in Mental Test Scores, Variability, and Numbers of High Scoring Individuals." *Science* 269:41-5.
- Hess, Beth B. and Myra Marx Ferree, eds. 1988. *Analyzing Gender: A Handbook of Social Science Research*. Newbury Park, CA: Sage.
- Hirschman, Charles. 1983. "America's Melting Pot Reconsidered." *Annual Review of Sociology* 9:397-423.
- Inter-university Consortium for Political and Social Research. 2003. *About GSS: Introduction to the GSS*. Retrieved January 31, 2003 (<http://www.icpsr.umich.edu:8080/GSS/about/gss/about.htm>).
- Jacob, Brian A. 2002. "Where the Boys Aren't: Noncognitive skills, Returns to School, and the Gender Gap in Higher Education." *Economics of Education Review* 21:589-98.
- Jacobs, Jerry A. 1995. "Gender and Academic Specialties: Trends among College Degree Recipients in the 1980s." *Sociology of Education* 68:81-98.
- . 1996. "Gender Inequality and Higher Education." *Annual Review of Sociology* 22:153-85.
- . 1999. "Gender and the Stratification of Colleges." *Journal of Higher Education* 70:161-87.
- Jencks, Christopher. 1972. *Inequality: A Reassessment of the Effect of Family and Schooling in America*. New York: Basic.
- Kalmijn, Matthijs. 1994. "Mother's Occupational Status and Children's Schooling." *American Sociological Review* 59:257-75.
- Kao, Grace and Jennifer S. Thompson. 2003. "Racial and Ethnic Stratification in Educational Attainment and Achievement" *Annual Review of Sociology* 29:417-42.
- Korupp, Sylvia, Harry B. G. Ganzeboom, and Tanja Van Der Lippe. 2002. "Do Mothers Matter? A Comparison of Models of the Influence of Mothers' and Fathers' Educational and Occupational Status on Children's Educational Attainment." *Quality and Quantity* 36:17-42.
- Krein, Sheila Fitzgerald and Andrea H. Beller. 1988. "Educational Attainment of Children from Single-Parent Families: Differences by Exposure, Gender, and Race." *Demography* 25:221-34.
- Lewis, Susan K. and Valerie K. Oppenheimer. 2000. "Educational Assortative Mating across Marriage Markets: Non-Hispanic Whites in the United States." *Demography* 37:29-40.
- Long, J. Scott. 2001. *From Scarcity to Visibility: Gender Differences in the Careers of Doctoral Scientists and Engineers*. Washington, DC: National Academy Press.
- Lopez, Nancy. 2003. *Hopeful Girls, Troubled Boys: Race and Gender Disparity in Urban Education*. New York: Routledge.
- McHugh, Maureen C. and Irene Hanson Frieze. 1997. "The Measurement of Gender-Role Attitudes: A Review and Commentary." *Psychology of Women Quarterly* 21:1-16.
- McManus, Patricia and Thomas A. DiPrete. 2001. "Losers and Winners: The Financial Consequences of Divorce for Men." *American Sociological Review* 66:246-68.
- Mickelson, Roslyn Arlin. 1989. "Why Does Jane Read and Write So Well? The Anomaly of Women's Achievement." *Sociology of Education* 62:47-63.
- National Opinion Research Center [NORC]. 2003. *General Social Survey: GSS Study Description*. Retrieved January 31, 2003 (<http://www.norc.uchicago.edu/projects/genSOC1.asp>).
- Organization for Economic Cooperation and Development [OECD]. 2004. *Education at a Glance 2004*. Retrieved March 30, 2006 ([http://www.oecd.org/document/7/0,2340,en\\_2649\\_201185\\_33712135\\_1\\_1\\_1\\_1,00.html](http://www.oecd.org/document/7/0,2340,en_2649_201185_33712135_1_1_1_1,00.html)).
- Papanek, Hanna. 1985. "Class and Gender in Education—Employment Linkages." *Comparative Education Review* 29:317-46.
- Powell, Brian and Douglas B. Downey. 1997. "Living in Single-Parent Households: An Investigation of the Same-Sex Hypothesis." *American Sociological Review* 62:521-39.
- Powell, Mary Ann and Toby L. Parcel. 1997. "Effects of Family Structure on the Earnings Attainment Process: Differences by Gender." *Journal of Marriage and the Family* 59:419-33.
- Rosen, Bernard C. 1959. "Race, Ethnicity, and the Achievement Syndrome." *American Sociological Review* 24: 47-60.
- Rosen, Bernard C. and Carol S. Aneshensel. 1978. "Sex Differences in the Educational—Occupational Expectation Process." *Social Forces* 57:164-86.
- Rosenzweig, Mark T and T. Paul Schultz. 1982. "Market Opportunities, Genetic Endowments, and Intrafamily Resource Distribution: Child Survival in Rural India." *American Economic Review* 72:803-15.
- Sewell, William H., A. O. Haller, and Alejandro Portes. 1969. "The Educational and Early

- Occupational Attainment Process." *American Sociological Review* 34:82-92.
- Sommers, Christina H. 2000. *The War Against Boys: How Misguided Feminism Is Harming our Young Men*. New York: Touchstone.
- Thomas, Gail E., Karl L. Alexander, and Bruce K. Eckland. 1979. "Access to Higher Education: The Importance of Race, Sex, Social Class, and Academic Credentials." *The School Review* 87:133-56.
- Thompson, S. 2003. "Male Student's College Achievement Gap Brings Concern." *The Washington Post*, August 31, p. A12.
- Thornton, Arland, Duane F. Alwin, and Donald Camburn. 1983. "Causes and Consequences of Sex-Role Attitudes and Attitude Change." *American Sociological Review* 48:211-27.
- Thornton, Arland and Deborah Freedman. 1979. "Changes in the Sex-Role Attitudes of Women, 1962-1977: Evidence from a Panel Study." *American Sociological Review* 44: 831-42.
- Turner, Sarah E. and William G. Bowen. 1999. "Choice of Major: The Changing (Unchanging) Gender Gap." *Industrial and Labor Relations Review* 52:289-313.
- Twenge, Jean M. 1997. "Attitudes toward Women, 1970-1995: A Meta-Analysis." *Psychology of Women Quarterly* 21:35-51.
- U.S. Department of Education, National Center for Education Statistics. 2004. *Digest of Education Statistics 2004*. Washington DC: U.S. Government Printing Office.
- Walby, Sylvia. 1986. *Patriarchy at Work: Patriarchal and Capitalist Relations in Employment*. Minneapolis, MN: University of Minnesota Press.
- Xie, Yu and Kimberlee A. Shauman. 2003. *Women in Science: Career Processes and Outcomes*. Cambridge, MA: Harvard University Press.