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Journal

Social Science Research, 35(3)

ISSN

0049-089X

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Publication Date

2006-09-01

DOI

10.1016/j.ssresearch.2004.12.001

Available online at www.sciencedirect.com
ScienceDirect
Social Science Research 35 (2006) 577–619
Social Science RESEARCH
www.elsevier.com/locate/ssresearch

Occupational sex segregation and the earnings of occupations: What causes the link among college-educated workers? ☆

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Available online 23 February 2005

Abstract

A significant proportion of the earnings gap between men and women is attributable to occupational sex segregation and the concentration of women in relatively low-paying occupations, but we do not yet know why women continue to be employed disproportionately in lesser-paying occupations. I attempt to explain the sex gap in the relationship between average occupational earnings and occupational attainment by modeling occupational placement among a nationally representative sample of college-educated new labor force entrants. I test empirical predictions derived from supply- and demand-side theories of occupational sex segregation using a conditional logit model, strong controls for human capital investments, and a set of occupational characteristic measures that extends beyond those used in previous research. The results of this analysis show that sex differences in college major explain 11–17% of the sex gap in the likelihood of employment in relatively high-paying occupations. However, even among recent labor force entrants who have very similar human capital investments, i.e., college graduates with the same majors, women and men enter different types of occupations. The sex differences in the distribution of workers across occupational

☆ This research was supported by a postdoctoral fellowship from the National Academy of Education and Spencer Foundation. I thank Yu Xie, Mary Jackman, Eric Grodsky, and two anonymous reviewers for helpful comments and suggestions on earlier drafts of this paper. A previous version of this paper was presented at the 2003 Annual Meeting of the International Sociological Association Research Committee on Social Stratification (RC28) in New York, NY.

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doi:10.1016/j.ssresearch.2004.12.001

characteristics, coupled with the differential remuneration of the influential characteristics explains an additional 41% of the sex gap in the attainment of relatively lucrative occupational placement.

Keywords: Occupational sex segregation; Earnings gap; Gender inequality; Occupational characteristics; College majors

1. Introduction

In 2002, the female-to-male ratio of earnings was 0.778 among all workers over 25 years old, and among college-educated workers women earned only 74.3 cents for every dollar earned by men (Statistics, 2003). We know that a significant proportion of this sex gap is attributable to occupational sex segregation and the concentration of women in relatively low-paying occupations (Treiman and Hartmann, 1981).[1] But, despite a rich body of research, we do not understand the causes of this continued sex gap in occupational attainment. The ''ghettoization'' of women in low-paying occupations persists despite the emergence of a female advantage in bachelor's degree attainment, sex equity in the attainment of master's and professional degrees (Bae et al., 2000), and growing gender equity in labor force participation and attachment (Bianchi, 1995; Reskin and Padavic, 1994). This economic dimension of occupational sex segregation is particularly puzzling given women's advantage over men in the attainment of occupational status as measured by occupational education (Hauser and Warren, 1997; Warren et al., 1998), and the growing tendency for young women to attach as much importance as do young men to the extrinsic rewards of work (Marini et al., 1996).

Why do women continue to be employed disproportionately in lesser-paying occupations? We do not yet have a satisfactory answer to this question partly because prior research has been limited in several ways. First, previous research has not distinguished the relative contributions of educational and labor market processes, as it has not adequately controlled for the influence of gender segregation that occurs prior to labor market entry. Second, within- and between-occupation influences on the sex gap in earnings are often conflated as existing analyses typically model individual-level earnings with inadequate controls for occupation-level determinants. Third, previous studies have not identified how occupational characteristics are leveraged against one another in the face of actual choices and constraints since they include only limited sets of occupations and measures of the occupational characteristics. Furthermore, most previous research has focused on explaining the association between occupational gender composition and pay (England et al., 1994, 2000; Petersen and Morgan, 1995; Tam, 1997; Tomaskovic-Devey and Skaggs,

[1] Indeed, Petersen and Morgan (1995) claim that all of the gender gap in earnings is attributable to the sex segregation of jobs when jobs are measured at detailed levels.

2002), rather than on the association between gender and occupational allocation (Reskin, 1993; Tomaskovic-Devey and Skaggs, 2002).

The research reported here addresses some of these limitations and aims to identify the link between sex-segregated occupational allocation and the earnings of occupations. I attempt to explain why the relationship between average occupational earnings and occupational attainment is less positive for women than it is for men by modeling occupational placement among a nationally representative sample of college-educated new labor force entrants drawn from the 1993 *National Survey of College Graduates* (NSCG). Using a conditional logit model and a detailed classification of occupation, I first estimate the marginal sex difference in the association between occupational attainment and average occupational earnings. I then attempt to statistically account for the relationship by introducing to the model a strong control for human capital investments and a set of measures of occupational characteristics predicted by supply- and demand-side explanations to affect both the gendered allocation of workers and the valuation of occupations. Finally, I use a decomposition analysis to estimate the relative explanatory power of each factor that is hypothesized to explain why women are segregated into relatively low-paying occupations.

2. Influences on worker allocation and occupational remuneration

Both supply- and demand-side perspectives identify many of the same individual and occupational characteristics as important factors in the processes that generate occupational sex segregation and the sex gap in the attainment of high-paying occupations (Reskin, 1993). Primary among these are human capital investments, sex-typed abilities, and preferences for occupational characteristics. Supply-side explanations attribute occupational sex segregation to individual-level sex differences in the distribution of these types of characteristics. Demand-side explanations attribute segregation to the perception, by employers and other employees, of sex differences in the distribution of these individual-level characteristics and/or of differences in job requirements and the gender-appropriateness of those requirements. For a factor to be a potential explanation of the economic dimension of occupational sex segregation, it must (1) be unequally distributed between the sexes, affect the probability of entry into different occupations and affect occupational remuneration, or (2) be differentially rewarded for men and women regardless of its distribution across men and women. With these general principles in mind, I review potential explanatory factors below. My review draws on a broad literature that most often examines gender inequality in the labor force as a whole. Although the population of interest here—young college-educated workers—is comparatively select, I note only a few areas in which the relevance of previous research findings to the present study is limited.

2.1. Human capital

In the aggregate, men and women differ in the human capital they bring to the labor market. There are two main explanations for the differences. The human

capital theory, as articulated by Becker (1985, 1991), attributes sex differences in human capital investments to biologically and socially based gender differences in responsibility for child bearing and rearing. The socialization perspective attributes sex differences in human capital investments to the process of socialization, by which young people learn sex-typed values and social roles (Eccles and Hoffman, 1984; Herzog, 1982; Marini and Greenberger, 1978) that generate different occupational aspirations (Jacobs, 1989; Marini and Brinton, 1984; Sandberg et al., 1987; Wolfe and Betz, 1981; Xie and Shauman, 1997), expectations for their adult work and family roles (Arnold, 1995; Eccles and Hoffman, 1984), and investments in secondary and postsecondary coursework (Bae et al., 2000; Jacobs, 1989, 1995, 1996; Peng and Jaffe, 1979; Polachek, 1978; Turner and Bowen, 1999; Ware and Lee, 1988; Xie and Shauman, 2003). According to both perspectives, men are more likely than women to invest in marketable human capital, i.e., the skills, education, and experience that enables high productivity, and therefore high remuneration, in the market.

2.1.1. College major

The influence of human capital investments on occupational outcomes is well known. Thus, in studies of occupational sex segregation, it is necessary to control for the effects of pre-market inequality in human capital investments (Brown and Corcoran, 1997; England et al., 1988; Kilbourne et al., 1994b; Marini and Fan, 1997; Xie and Shauman, 2003). However, since women currently earn a majority of the bachelor's and master's degrees awarded (Bae et al., 2000; Jacobs, 1996; Spain and Bianchi, 1996; Xie and Shauman, 2003), the commonly used controls for level of educational attainment are insufficient (e.g., Elliott and Parcel, 1996; England et al., 1988; Kaufman, 2002; Kilbourne et al., 1994b; Okamoto and England, 1999). Instead, more detailed measures of educational investments are necessary to capture the significant human capital differences that arise from educational sex segregation such as the segregation of college majors (Davis, 1965; Jacobs, 1989, 1995; Peng and Jaffe, 1979; Polachek, 1978). Women are less likely than men to choose fields, such as science and engineering, that are associated with higher-paying occupations (Davies and Guppy, 1997; Marini and Fan, 1997; Wilson and Boldizar, 1990; Xie and Shauman, 2003). Few studies include detailed measures of college major or other educational investments that adequately control for this influential sex difference in human capital (exceptions include Brown and Corcoran, 1997; Daymont and Andrisani, 1984; Gerhart, 1990).

The statistical association between college major and occupational attainment may reflect a causal relationship, but the relationship may be spurious if choice of major and occupational outcome are jointly determined by early occupational expectations. While there is some empirical evidence that a minority of individuals take an instrumental approach to education (Xie and Goyette, 2003) at the aggregate level it requires strong assumptions about individual-level access to information about career preparation and commitment to expectations, and market-level constancy in demand for workers with specific educational credentials. Such assumptions are not empirically supported (Freeman, 1971, 1976; Jacobs, 1989; Xie and Shauman, 2003). It is likely, therefore, that occupational decisions are conditioned on educa-

tional decisions and experiences. That is, to some extent the choice of college major structures the career opportunities that will be available to a graduate upon labor market entry. Although the strength and narrowness of the connections between college major and occupations vary across fields, it is possible to identify frequently traveled pathways from specific college majors to specific occupational categories (Kerckhoff, 1996). The sex segregation of college majors consequently may deflect men and women onto different and unequally remunerated occupational paths prior to market entry. Taken together, these explanations of the major-occupation connection among college-educated workers indicate the necessity of accounting for both pre-college occupational aspirations and a detailed classification of college major. In this study I include a strong control for college major, but lack data on occupational expectations for the cohort of college-graduates studied here. Occupational expectation is therefore an omitted variable whose influence on sex differences in occupational allocation is likely to be captured in this analysis by the control for college major. The implications of this omission for the estimated effect of college major are discussed below.

2.1.2. Specialized vocational preparation

College major is a type of specialized human capital investment that may explain sex differences in occupational placement and pay. Recently, researchers have considered the influence of another form of human capital investment, specialized on-the-job training, which is made in the context of a hiring firm, occupation, and/or industry and in collaboration with employers and other employees. According to human capital theory (Becker, 1975), because specialized human capital investments are less versatile than other forms of capital, i.e., they are valued only in specific work contexts, this type of investment is (1) relatively costly and risky for individuals given that a job shift might render the investment worthless, (2) relatively costly and risky for employers given that the investment is lost with employee turnover and must be remade with a new hire, and (3) will be well-compensated by employers who want to encourage workers to make the investment and then to continue working so that its value will be realized. Specialized human capital may help explain gender earnings inequality if women are less likely than men to gain access to work settings that require and reward specialized occupation-, industry-, or firm-specific training. There is empirical evidence that such gender differences in access to specialized training exist, but the reasons for the disparity, whether it is due to self-selection, discrimination or both, and whether it has an independent influence on earnings inequality is currently in debate (England et al., 2000; Tam, 1997; Tomaskovic-Devey and Skaggs, 2002).

2.2. Sex-typed abilities

The sex-typing of abilities may contribute in two ways to the sex gap in the attainment of lucrative jobs. First, stereotyped beliefs about sex differences in abilities inform the socialization practices that help produce and/or reinforce (Eccles, 1994; Rogers, 2001) sex differences in the cognitive, social, and physical abilities that are

valued in the market. The empirical evidence of sex differences in cognitive abilities is robust. Throughout elementary and secondary school, girls consistently outperform boys on standardized tests of verbal abilities and boys outperform girls on math and science assessments (Campbell et al., 2000) although the gap in math achievement is consistently smaller than the verbal gap and, furthermore, has declined over time (Xie and Shauman, 2003). Girls are socialized to be more empathetic, socially connected, and nurturing of others (Gilligan, 1982) than are boys. In terms of physical differences, males tend to be physically stronger and more active than are females, but females tend to excel at tasks requiring small motor coordination such as finger dexterity.

Second, socialization may produce sex-stereotyped assessments of abilities in one's self (Correll, 2001, 2004) and in others (Valian, 1999). Research shows that such biased assessments persist despite contrary evidence such as good grades and test scores. For example, parents, teachers, and students themselves tend to underestimate girls' and overestimate boys' achievement in math and science (Correll, 2001, 2004). On the supply-side, since a person must believe he/she has the skills required for a given career prior to considering it a viable option (Eccles, 1994), sex-stereotyped self-assessments will contribute to sex-typing of occupational aspirations and choice. On the demand-side, assumptions about the abilities that jobs require combined with sex-biased assessments of abilities by employers may lead to occupation placements that are sex-typed (Oppenheimer, 1968).

Furthermore, sex-typed skill demands may be associated with occupational pay levels and thus may contribute to the relatively low pay of the occupations women predominantly enter. For example, quantitative skills are positively associated with occupational wages (England, 1992; Grodsky and Pager, 2001; Kilbourne et al., 1994b; Parcel and Mueller, 1989), whereas there is a wage penalty for occupations that involve "nurturant" or "caring" skills (England, 1992; England and Folbre, 1999; England et al., 1994; Kilbourne et al., 1994b). The effect of demand for physical skills on wages is less clear, but net of controls for working conditions, the demand for physical strength seems to have a slight positive effect on earnings (England, 1992; Kilbourne et al., 1994b; Parcel and Mueller, 1989).

2.3. Preferred occupational characteristics

Supply-side explanations attribute a portion of segregation to sex differences in preferences for occupational characteristics. According to economic reasoning such occupational characteristics may also affect remuneration of occupations because occupational characteristics preferred by more workers tend to increase labor supply and thus depress wages.

2.3.1. Work–family compatibility

Both human capital and gender role socialization theories predict that women more than men prefer work that is compatible with the primary caregiver familial role. Human capital theory posits that men and women rationally prefer different occupations because they choose occupational characteristics that allow them to

maximize their lifetime earnings given the sex-specific patterns of employment dictated by the gendered division of household labor (Becker, 1985; Polachek, 1979, 1981; Zellner, 1975). The theory predicts that women will be attracted to jobs that accommodate intermittent labor force participation by, for example, having low rates of wage depreciation and skill deterioration during absences from the labor force and offering attractive starting wages and flexible work schedules.

The socialization perspective also predicts that women will prefer jobs that can be combined more easily with their family roles. Since boys and men are socialized to view work as their primary adult role and breadwinning as their primary role in the family, they do not experience conflict between their work and family roles (Arnold, 1995; Eccles and Hoffman, 1984). For girls and women, however, socialization emphasizes the priority of their familial roles so the conflict between work and familial roles is a prominent feature of adult life (Duxbury and Higgins, 1991; Williams, 2000) and one that is anticipated long before it is experienced first-hand. Research shows that a young woman's orientation to familial roles significantly influences her career aspirations (Sandberg et al., 1987; Spade and Reese, 1991; Ware and Lee, 1988; Wolfe and Betz, 1981), causing even career-oriented women to take a "contingency approach" to planning their future career by choosing a career path that is perceived to be compatible with the demands of their future family roles (Almquist et al., 1980; Angrist and Almquist, 1975, 1993). Studies show that, at all levels of educational attainment, women are more likely than men to expect intermittency, to experience more breaks in employment (Felmlee, 1993; Okamoto and England, 1999), and to change their labor force participation and career plans in response to work–family conflict (Gerson, 1985; Seymour and Hewitt, 1997).

If women choose occupations on the basis of the ease with which employment can be combined with their family roles, as both economic and sociological theories predict, then the availability of flexible or part-time work should be more strongly associated with occupational placement for women than for men. Furthermore, if the availability of flexible work schedules is an attractive non-pecuniary benefit that women are disproportionately eager to attain and willing to substitute in lieu of higher pay, as is hypothesized by the theory of compensating differentials (Glass and Camarigg, 1992), then controlling for this occupational characteristic should help explain the segregation of women in relatively low-paying occupations.

2.3.2. Types of work

Since individuals choose types of work based on their interests and work values, i.e., the rewards they expect from work (Davis, 1965), sex differences in values and interests may explain sex differences in occupational placement and pay. Sociological perspectives predict that the socialization process will generate sex-specific work values and preferences for types of work (Corcoran and Courant, 1985; Davis, 1965; Eccles and Hoffman, 1984) and empirical research documents the existence of such differences and their persistence from adolescence into adulthood (Johnson, 2002). Studies of high school and college students have found that

young women attach greater importance than males to the intrinsic, altruistic, and social rewards associated with an occupation, whereas male students placed a higher value on such extrinsic rewards as money and power (Beutel and Marini, 1995; Bridges, 1989; Herzog, 1982; Johnson, 2002; Konrad et al., 2000; Lueptow, 1980). These sex differences in job values were found to be significant and consistent across over 200 studies conducted between 1970 and 1998 (Konrad et al., 2000). The results of the extensive meta-analysis showed that young women are much more likely than young men to consider enjoyment of work and using one's skills (intrinsic rewards), working with people and making friends (social rewards), and helping others (altruistic rewards) very important to their decisions about career and work. In contrast, the vast majority of studies find that males more than females report that the most important aspects of work are opportunities for high earnings, promotions, leadership, and power (Konrad et al., 2000), although there is some evidence that young women are coming to value occupational prestige as much as men (Marini et al., 1996).

The disproportionate female preference for working with people is one side of another persistent male–female dichotomy in preferences for types of work—the People–Thing dimension (Lippa, 1998). Research on vocational interests identifies the People–Thing dimension as a fundamental characteristic of both jobs and the kinds of people who choose them (Lippa, 1998; Prediger, 1982). In contrast to "people" work that emphasizes interpersonal activities, services, and relationships, vocations that fall toward the "things" end of the continuum emphasize work with machines, materials, and tools (Prediger, 1982). Males are more likely to express preferences for occupations that involve working with things and this male preference is as strong and consistent as the female preference for work with people (Hansen et al., 1993; Lippa, 1998). Moreover, there is a strong association between occupational interests and occupational aspirations: the occupations to which individuals aspire tend to have the characteristics they value (Lent et al., 1994; Tracey and Hopkins, 2001). The influence of work values on actual occupational placement, however, has not been empirically examined, nor has the impact of these occupational characteristics on occupational remuneration.

2.3.3. Working conditions

Compared to traditionally male-dominated occupations, the working conditions of most female-dominated occupations are relatively comfortable. In female-dominated occupations workers have a relatively low likelihood of exposure to hazards, extremes of hot and cold, outdoor work, significant risk of death, and high stress situations (England, 1992; Filer, 1985, 1989; Jackman, 1999; Jacobs and Steinberg, 1990). These aggregate-level differences in occupational characteristics have been interpreted as evidence of gender differences in preferences for working conditions (Filer, 1989; Rosen, 1986). If such differences in preferences (or aversion) exist, the theory of compensating differentials predicts that they generate sex differences in occupational earnings. According to this perspective, occupations with unpleasant work conditions must be paid a premium to attract workers whereas occupations with comparatively attractive work conditions need not and will be paid relatively

less (Rosen, 1986). If men are less averse than women to bad work conditions, they will be more likely to accept the financial compensation for unpleasant working conditions and gain employment in occupations that are unpleasant but relatively high paying (Filer, 1989; Rosen, 1986).

The empirical evidence bearing on the association between worker preferences, working conditions and wages, however, is inconclusive (England et al., 1994; Filer, 1989; Jacobs and Steinberg, 1990; Kilbourne et al., 1994a,b). The association between earnings and the exposure to physical disamenities such as unpleasant physical conditions (e.g., extreme hot or cold, loud noises) or health hazards (e.g., heights, chemicals, etc.) varies across studies (England et al., 1994; Jacobs and Steinberg, 1990; Kilbourne et al., 1994a,b; Sorensen, 1989). Extremely risky working conditions such as those that pose a risk of death do seem to offer a compensating earnings differential (Brown, 1980). If sex differences in preferences for working conditions that are differentially remunerated exist, controlling for such preferences should help explain the sex gap in the association between occupational earnings and occupational placement. However, given that few professional occupations entail working under such dangerous or uncomfortable conditions, the influence of exposure to physically unpleasant working conditions is likely to be limited as an explanation of sex differences in occupational earning for the population of college-graduates that is the subject of this analysis.

3. Hypothesis

The empirical implication of the preceding discussion is that, for the college-educated work force, the occupational sex segregation and the resulting sex gap in the likelihood of placement in relatively lucrative occupations, may be explained in part by the following factors:

(1) Sex differences in human capital investments such as college major and specific vocational training.
(2) Sex-typed abilities expected for incumbents in occupations.
(3) Occupational characteristics that differentially appeal, or are assigned, to men and women workers.

Identifying the mechanisms by which occupational characteristics influence the segregation of men and women into differentially remunerated occupations is beyond the scope of the data and methods employed for this analysis. The allocation process includes the choices of workers, the choices of employers (including discrimination), and structural constraints (including institutionalized forms of discrimination) and this analysis is not able to disentangle these important influences. However, by identifying the characteristics associated with the earnings dimension of occupational sex segregation, this research provides a necessary first step in the identification of the mechanisms that generate sex inequality in the labor market (Reskin, 2003).

4. Data and methods

To test the above-stated research hypothesis, I model the individual-level occupational placement of a cohort of college-educated workers extracted from the 1993 *National Survey of College Graduates* (NSCG) as a function of occupation-level characteristics operationalized using data from multiple sources including the *1990 U.S. Census 1-Percent Public Use Microdata Sample* (PUMS) and the *O*NET Occupational Information Network* (O*NET). The analysis focuses on sex differences in the association between occupational attainment and the average earnings in occupations and attempts to assess the extent to which this disparity is statistically explained by sex differences in the attainment of other occupational characteristics.

4.1. Individual-level data sample and variables

The NSCG is a survey of a representative sample of individuals identified in the 1990 Census as having earned a bachelor's degree. The 1993 sample included 215,000 individuals under age 75 working in all occupational fields and holding bachelor's degrees in all fields of study, although those working in scientific and technical fields were oversampled (Foundation, 1997). I use the NSCG for this analysis because it provides the largest nationally representative sample available that includes detailed information about college graduates' employment characteristics, degree attainment, and field of postsecondary study. The sample extracted for this analysis includes individuals aged 23–35 who had attained a bachelor's degree between 1985 and 1993 and who were working full time in the civilian labor force at the time of the survey in 1993.[2] The exclusion of part-time workers is necessary since occupational placement may be endogenous to this dimension of labor force attachment since the possibility of working part time is not evenly distributed across all occupations. Furthermore, since part-time work is associated with sex, this selection criterion removes an influence that may confound the measurement of sex differences in occupational placement. In addition, I further controlled for educational attainment by restricting the sample to those with no post-baccalaureate or professional degrees. This selection criterion truncates the sample by excluding individuals who have attained, or

[2] Selection of full-time workers introduces a slight downward bias on the estimated sex differences in the association between occupational pay and placement. To test the direction and extent of the bias introduced by these selection criteria, I estimated models with a sample that includes all NSCG respondents who reported working part time or being out of the labor force at the time of the 1993 survey (results available upon request from the author). For these models I imputed missing occupation information using the most commonly entered occupation by major among NSCG baccalaureates who attained their degree between 1975 and 1993. The modal occupation by major is assigned to each respondent with missing occupation data according to his/her reported undergraduate major. Since many respondents who reported being out of the labor force nevertheless reported occupational information, occupation was imputed for only 136 respondents. In the presence of the full set of covariates, the estimate b_{EARNINGS} for this less selective sample is -0.018 compared to -0.016 for the (more selective) analytic sample. The analytical sample used here, therefore, provides conservative estimates of the sex differences in the association between occupational earnings and occupational attainment.

are currently working toward, a post-baccalaureate degree. The truncation limits the generalizability of the results to those college graduates who do not pursue graduate education. It also may disproportionately weight the experience of those with majors that are not strongly associated with postgraduate education or who aspire to occupations that do not require postgraduate degrees. This selection criterion is essential, however, to ensuring that this analysis does not confound the separate influences exerted on occupational attainment by the quantity and quality of educational attainment. Together these two selection criteria improve the reliability of the results presented below by producing a sample that is homogeneous with respect to level of labor force attachment and educational attainment that therefore provides conservative estimates of sex differences in occupational attainment. After the exclusion of respondents with incomplete information on occupation (coded to Census 3-digit occupation codes), sex (FEMALE = 1), and bachelor's degree major, the analytic sample included 12,925 individuals, of which 5265 (40.73%) were female.

Focusing the analysis on a cohort of college-educated workers who only recently entered the labor market limits the generalizability of the results, as only about 27% of people aged 25–34 attain a bachelor's degree (Bauman and Graf, 2003), but the focus is theoretically and empirically justified. As college completion rates increase, skill requirements of jobs are upgraded, and the distribution of jobs in the U.S. shifts away from the manufacturing sector, college-educated workers are increasingly a prevalent and important part of the U.S. labor market. Further, since educational requirements distinguish discrete segments of the occupational distribution, it is very likely that the process of occupational attainment is qualitatively different, and should be studied separately, for workers with different levels of education. Empirically, the focus on college-educated workers is necessitated by the lack of data that would allow detailed measurement of both human capital investments and occupational attainment for the entire distribution of workers.

The focus on college-educated workers also has some appealing empirical advantages. By using a sample of new entrants to the labor force, i.e., young people who had recently (within 9 years of the survey year) earned a bachelor's degree, this analysis restricts the influence of two factors that confound the measurement of sex differences in occupational attainment: cohort differences in characteristics and the sorting influences of the labor market. Analyzing the occupational placement of the most recent entrants to the labor force controls the influence of cohort differences in human capital investments, labor market experiences and orientations toward work. The educational investments and work orientations of men and women have become more similar over time, and they currently enter a labor market that is very different in terms of attitudes about and regulation of sex discrimination than those entered by members of older cohorts. Excluding older cohorts of degree recipients therefore limits the potential for upwardly biased estimates of sex differences in occupational attainment. In addition, assessing sex differences among young workers limits the impact of labor market sorting to that occurring at entry into the labor market. Research showing that sex differences in occupational outcomes are not fully explained by cohort differences indicates that labor market mechanisms may operate over time to sort men and women into separate sets of occupations, i.e., that sex

segregation intensifies over the life course of a cohort (Jacobs, 1989). Looking only at recent degree recipients parses the influence of such sorting mechanisms and allows a focused investigation of the sex differences that occur as young people make the transition from postsecondary education to the labor force.

4.1.1. Individual occupational attainment

Occupational attainment by each NSCG sample respondent is measured using 1990 Census 3-digit occupation codes (OCC) that have been aggregated to 386 distinct occupations. This aggregation was necessary to attain compatibility with the data sources for the occupational characteristic measures. Of the full set of occupational options, 94 occupations were not entered by any NSCG respondents and are therefore excluded from the choice set. For this analysis, each individual is assumed to have the opportunity to enter any of the 292 occupations for which the placement of at least one NSCG respondent provides empirical evidence that each should be considered part of the choice set. Employment in a given occupation is conceptualized as the outcome of a process by which individuals are sorted into occupations that have specific characteristics by both supply- and demand-side forces.

4.2. Occupational characteristics

Measures of occupational characteristics are from four sources: the NSCG (described above), the 1-percent 1990 Census IPUMS, the O*NET Database Release 6.0, and England et al. (1994). All occupational characteristics are measured at the level of the slightly aggregated (386-category) 3-digit Census occupation codes. The O*NET Database Release 6.0 is the most current version of the online successor to the *Dictionary of Occupational Titles*. It is a source of updated and detailed information about the characteristics, requirements, and activities of a broad range of jobs (Boese et al., 2001). The O*NET Database provides analyst ratings of occupational and worker attributes for jobs classified according to the 2000 Standard Occupational Classification (SOC) system. I recoded the SOC codes to be compatible with the 1990 3-digit Census occupational codes.[3] Measures of cognitive and physical ability demands, work types and work conditions are derived from the O*NET using the results of an exploratory factor analysis. The factor analysis indicated the existence of underlying constructs that are both theoretically relevant as predicted correlates of occupational segregation and reassuringly familiar since they are consistent with the results of previous analyses of DOT data (Hadden et al., 2003). The procedure used to generate the factor-guided scales is described in Appendix A.

[3] I reconciled the SOC and 3-digit Census occupation codes by first recoding each to the equivalent DOT occupational codes using crosswalks distributed by the National Crosswalk Service Center (www.xwalkcenter.org). I assigned the mean of the O*NET variables to the census categories that incorporated two or more SOC categories before linking the O*NET measures to the individual-level NSCG data.

Table 1 presents descriptive statistics and a selection of the occupational categories with either very high or very low scores for each of the occupational characteristic variables. This table also presents the bivariate correlation between

Table 1
Descriptive statistics for variables measuring occupational characteristics across 292 potential occupational outcomes

Covariates	Mean (SD)	Max. Min.	Correlation w/EARNINGS ($p>\|t\|$)[a]	Occupations with high values	Occupations with low values
Occupational earnings					
EARNINGS (in $1000)	23.785 (8.511)	59.174 2.393	1.000	Actuaries; Securities and financial services sales; Petroleum engineers; Managers, marketing, advertising, and public relations; Sales engineers.	Hairdressers and cosmetologists; Waiters' and waitresses' assistants; Animal caretakers, except farm; Child care workers, n.e.c.
Occupational characteristics					
Demand for sex-typed abilities					
VERBAL	0.226 (0.893)	2.099 −1.777	0.547 (0.000)	Administrators and officials, public admin.; Administrators, education and related fields; Teachers, elementary; Teachers, secondary.	Groundskeepers and gardeners, exc. farm; Brickmasons and stonemasons; Drywall installers; Furniture and wood finishers.
QUANTITATIVE	0.125 (1.012)	3.271 −1.786	0.510 (0.000)	Mathematical scientists, n.e.c.; Financial managers; Nuclear engineers; Statisticians; Surveyors and mapping scientists.	Private household cleaners and servants; Dental hygienists; Forestry workers, exc. logging; Painters, construction and maintenance.
PHYSICAL	−0.151 (0.835)	2.559 −1.420	−0.217 (0.000)	Firefighting occupations; Industrial truck and tractor equipment operators; Dancers; Truck drivers; Electricians; Bus drivers.	Typists; Hotel clerks; Religious workers, n.e.c.; Purchasing agents and buyers, n.e.c.; Computer programmers; Mathematical scientists, n.e.c.

(*continued on next page*)

Table 1 (*continued*)

Covariates	Mean (SD)	Max. Min.	Correlation W/EARNINGS ($p>\|t\|$)[a]	Occupations with high values	Occupations with low values
Specific vocational preparation					
JOB ZONE	5. 963 (1.976)	8.500 2.000	0.607 (0.000)	Managers, medicine and health; Marine and naval architects; Metallurgical and materials engineers; Aerospace engineers; Financial managers.	Taxicab drivers and chauffeurs; Parking lot attendants; Freight, stock, and material handlers, n.e.c.; Laborers, except construction.
Work–family compatibility					
PARTTIME	0.165 (0.122)	0.741 0.000	−0.560 (0.000)	Dental hygienists; Private household cleaners and servants; Musicians and composers; Child care workers, n.e.c.; Waiters and waitresses.	Industrial engineers; Mechanical engineering technicians; Mechanical engineers; Aerospace engineers; Chemical engineers; Mining engineers.
FAMFRIEND	−0.089 (0.064)	0.060 −0.333	0.273 (0.000)	Health record technologists and technicians; Managers, horticultural specialty farms; Occupational therapists; Dental hygienists.	Miscellaneous hand working occupations; Sales engineers; Farm workers; Aircraft mechanics, exc. engine; Surveying and mapping technicians.
Types of work: Intrinsic and extrinsic rewards					
INTRINSIC	0.180 (0.957)	2.034 −1.937	0.593 (0.000)	Painters, sculptors, craft-artists, and artist printmakers; Medical scientists; Aerospace engineers; Designers; Actors and directors.	Hand packers and packagers; Janitors and cleaners; Telephone operators; Meter readers; Mail carriers, postal service.
AUTHORITY (1 = supervisory)	0.092 (0.290)	1.000 0.000	0.172 (0.003)	See Appendix C.	See Appendix C.
EXTRINSIC	0.175 (0.949)	2.351 −1.962	0.664 (0.000)	Actors and directors; Aerospace engineers; Mechanical engineers; Supervisors, police and detectives; Securities and financial services sales.	Ushers; Groundskeepers and gardeners, except farm; Kitchen workers, food preparation; Laborers, except construction.

Table 1 (*continued*)

Covariates	Mean (SD)	Max. Min.	Correlation w/EARNINGS ($p>\|t\|$)[a]	Occupations with high values	Occupations with low values
Types of work: Work with people vs. work with things					
PEOPLE	0.208 (0.943)	2.696 −1.142	0.025 (0.677)	Registered nurses; Clergy; Child care workers, n.e.c.; Social workers; Physicians' assistants; Teachers, pre-kindergarten and kindergarten.	Miscellaneous plant and system operators; Hand molding, casting, and forming occupations; Tool and die makers.
THINGS	−0.207 (0.819)	1.887 −1.723	−0.059 (0.318)	Industrial machinery repairers; Machinery maintenance occupations; Aircraft mechanics, exc. Engine; Automobile mechanics.	Counselors, educational and vocational; Authors; Legal assistants; Clergy; Financial managers; Administrators and officials, public.
Working conditions					
BAD CONDITIONS	−0.150 (0.803)	2.281 −1.542	−0.206 (0.000)	Roofers; Structural metal workers; Heavy equipment mechanics; Plumbers, pipefitters, and steamfitters; Firefighting occupations.	Operations and systems researchers and analysts; Data-entry keyers; Counselors, educational and vocational; Authors.

[a] Values in parentheses are p values for the significance of the bivariate correlation coefficient (two-tailed tests).

occupational earnings and each of the other occupational characteristics.[4] Appendix Table 1 presents bivariate correlations for all variables as well as the partial correlation between EARNINGS and each covariate. The statistics presented in these tables are based on the 292 occupational categories in the choice set used for this analysis and are independent of the occupational distribution of NSCG respondents.

4.2.1. Occupational earnings

The 1990 1-percent Census PUMS data are the source for the focal occupational characteristic of this analysis: occupational earnings (EARNINGS). EARNINGS is

[4] The bivariate correlation between earnings and major is not presented since the correlation is not interpretable.

operationalized as the mean yearly income (in thousands of dollars) from wages or salary of employed full-time workers aged 25–35 in each occupational category.[5]

4.2.2. Human capital: Major-occupation connections

I test the influence of sex segregation in postsecondary education on the sex gap in occupational placement using a powerful and parsimonious control for the college major in which each of the NSCG respondents earned their baccalaureate. College major is coded using 28 discrete categories. The classification scheme and the sex-specific distribution of NSCG respondents across college majors are presented in Appendix Table 2. The index of dissimilarity for college majors is 33.61, indicating significant sex differences in the human capital investments made by the NSCG respondents during college.

Because some occupations require, either formally or informally, specialized educational attainment, the probability of employment in a given occupation may vary significantly across the subsets of the population that are defined by college majors. This is essentially a demand-side influence that, given the sex segregation of college majors, is expected to help explain sex differences in occupational attainment. Of course, many occupations have no such demands for specialized education, and therefore draw workers from many different educational backgrounds. To control for the effect of differential occupational demand for college majors, I created an indicator of the connections, or "frequently traveled pathways" (Kerckhoff, 1996), between college majors and occupations. Major-occupation connections are identified by the representation of the 28 specific baccalaureate college majors among the 1993 incumbents of occupations who had attained their bachelor's degree no earlier than 1975.[6] For occupations with 200 or more NSCG respondents, a significant connection with a major field is indicated if 15% or more of the workers in an occupation had earned their bachelor's degree in that major. For occupations with between 20 and 200 NSCG respondents, I conservatively identify the modal college major among the incumbents as the only major-occupation connection for that occupation. I consider a sample of 20 or fewer respondents too small to yield reliable information about major-occupation connections; all such occupations are coded as having no connection with any college major. Appendix B lists the major-occupation connections for each college major. I link the information on major-occupation connections to the individual-level records in the analytical sample by college major. Thus, for each individual in the NSCG sample of recent graduates and each occupational option he or she theoretically considers for employment, this indicator (MAJOR)

[5] Analyses based on alternative operationalizations of earnings produced comparable results and did not affect the substantive findings. I tried using median rather than mean earnings and the proportion of workers in each occupation earning more than 25,000 dollars per year, the operationalization used by Hauser and Warren (1997). Comparable results were also attained from models specified with sex-specific mean earnings, i.e., the occupational attainment of men (or women) was modeled on the mean earnings for men (or women) in each occupation.

[6] A slightly larger NSCG sample than the primary analytical sample of NSCG respondents was required to ensure the exogeneity and statistical reliability of this measure.

is coded one if there is a significant connection between the occupation and the individual's college major.

In addition to providing a parsimonious test of the hypothesis that sex differences in human capital investments influence sex differences in occupational attainment, the inclusion of MAJOR in the multivariate model provides a more nuanced articulation of the process of occupational attainment. In conjunction with the controls for sex differences in human capital investment imposed by the sample selection criteria, controlling for MAJOR parses the effects of pre-labor market human capital investments and allows for less biased estimates of the effects of other occupational characteristics on the sex gap in occupational earnings than those attained in extant studies of sex segregation and pay inequity.

4.2.3. Human capital: Specialized vocational preparation

Occupational demand for specialized training is measured with the O*NET variable JOB ZONE. The JOB ZONE data were developed as an interim step in the transition from the DOT measure of Specific Vocational Preparation (SVP) to the more detailed measures of experience, education, and job training requirements that will be provided for all occupations in future versions of the O*NET database but are incomplete in the most current release. JOB ZONE is coded on a 5-level scale that maps onto the 9-level scale on which SVP was originally coded in the DOT. The five levels rank increasing requirements for time spent in on-the-job vocational training, general education, and certification. To facilitate the comparability of this analysis with extant studies, I recode the JOB ZONE variable to the SVP scale using the midpoint of the equivalent range of the original 9-level measurement scheme.

4.2.4. Sex-typed abilities

To test if occupational demand for and remuneration of sex-typed abilities helps explain sex differences in occupational placement and pay, I include scale measures of occupational demand for three sex-typed abilities: VERBAL and QUANTITATIVE abilities, and PHYSICAL demands. Each of the scales is an unweighted average of the normalized scores (Z scores) of multiple elements extracted from the O*NET (see Appendix A). For all scales, higher values indicate that greater amounts of the ability are required for successful occupational performance. The bivariate correlation coefficients show demand for cognitive skills is positively associated with occupational pay. Demand for physical activity has a negative association with earnings, as is expected given that blue-collar jobs both demand more physical activity and are relatively low paying.

4.2.5. Work–family compatibility

The representation of part-time workers (PARTTIME) and a measure of sex differences in labor force participation (FAMFRIEND) in an occupational category are used here as crude indicators of work–family compatibility. Both of these measures are operationalized using the 1990 PUMS. PARTTIME is the occupation-specific proportion of all workers aged 25–60 who work less than 35 hours per week.

Greater representation of part-time workers may indicate a greater availability of flexible work schedules that may facilitate combining active employment with family responsibilities. FAMFRIEND is operationalized as the male–female difference in the proportions of people aged 25–40 in each occupational category who reported being out of the labor force at the time of the 1990 Census. Of the many reasons for leaving the labor force, only those having to do with family roles and responsibilities should vary by sex. I therefore use the sex disparity in labor force participation as an indicator of the degree to which work in each occupation can be combined with family responsibilities. Negative values of this measure indicate a female deficit in labor force participation and, therefore, lesser work–family compatibility. The positive correlation between FAMFRIEND and EARNINGS indicates that occupations with lesser gender disparities in labor force participation tend to have relatively high average earnings. In contrast, PARTTIME has a significantly negative marginal association with EARNINGS. Note that since part-time workers are excluded from the operationalization of EARNINGS, the negative correlation between PARTTIME and EARNINGS indicates that the prevalence of part-time work appears to depress the average earnings for all full-time, year-round workers in the occupational category.

4.3. Types of work: Intrinsic rewards, extrinsic rewards, and working with people vs. things

I include two measures of the extrinsic rewards of work and one measure of the intrinsic rewards in this analysis. Since authority over other workers conveys power, the indicator AUTHORITY is included as a measure of extrinsic job rewards. Following England et al. (1994), AUTHORITY is coded 1 for each 1990 occupation with the word manager, supervisor, or administration. Appendix C lists the occupations coded as involving authority over others. In addition, a scale measure of EXTRINSIC rewards is derived from the O*NET data. This variable combines O*NET measures of the degree to which an occupation provides opportunities for social status, recognition, and autonomy. The relative level of INTRINSIC rewards offered by each occupation is measured with a scale variable that averages O*NET variables measuring such things as the degree to which an occupation provides opportunities for workers to utilize their abilities, to gain a feeling of accomplishment, and to be creative. The validity of AUTHORITY and EXTRINSIC as measures of extrinsic rewards is reinforced by the significant and moderately strong positive correlations each has with EARNINGS. The strongly positive correlation between INTRINSIC and EARNINGS indicates that intrinsically rewarding work is also relatively well-paid.

Occupational emphasis on working with people and things is measured with two scale variables, PEOPLE and THINGS. PEOPLE measures the extent to which the jobs in an occupational category involve working with, teaching, caring for or providing services to other people. The strong association (correlation = .697, $p < .001$) between this variable and the dummy variable indicator of the demand for nurturance skills and caring labor used in the work of England and colleagues

(1994, 1999) shows that the two variables represent similar constructs.[7] THINGS is a scale measure of the degree to which the work done by those employed in an occupational category involves practical, hands-on problem solving and working with tangible materials, machines or structures. Neither of these work types is associated with occupational earnings in the bivariate context, but may help explain gender differences in the attainment of well-paid occupations in the presence of other occupational characteristics.

4.3.1. Working conditions

I use the variable BAD CONDITIONS to measure the working conditions of each occupation. This variable is a composite of six O*NET variables that measure daily exposure to various inhospitable work conditions and health hazards. As other researchers have found, occupations with bad working conditions tend to have relatively low EARNINGS.

4.4. Multivariate method for estimating occupational attainment

The conditional logit model is an ideal method for this analysis, as it models the association between occupational characteristics and an individual's log-odds of occupational placement (Hoffman and Duncan, 1988; Long, 1997; McFadden, 1974; Powers and Xie, 2000). Let P_{ik} denote the probability that the ith individual enters the kth occupation, with $i = 1, 2, \ldots, N$, and $k = 1, 2, \ldots, J$, where N is the sample size and J is the set of 292 available occupations. Let x_{ij} denote a vector of explanatory variables that are specific to each individual and each occupational outcome. The choice probability is specified as:

$$P_{ik} = \frac{\exp(x'_{ik}\beta)}{\sum_{j=1}^{j} \exp(x'_{ij}\beta)}. \quad (1)$$

For this analysis, MAJOR is the only x variable that varies by both i and k. All other x variables measure occupational characteristics that do not vary across individuals. Since my research interest lies in their sex-specific effects, I generate their variation across individuals by interacting each with the effects-coded dichotomous variable SEX (i.e., sex $= -1$ if male and sex $= 1$ if female). Hence, all the covariates vary by both occupation and individual.

As shown in Eq. (1), the conditional logit model is unusual in that it requires covariates that differ by both outcome category and individual, but yields coefficients that are invariant across all choice outcomes. As a result, the number of coefficients in the conditional logit model is determined by the number of independent variables

[7] I used a dummy variable indicator of nurturance skills that replicated the "Nurture Dummy" of England et al. (1994) for the 1990 occupational coding scheme in alternative specifications of the model. This variable had limited power to explain sex differences in the attainment of relatively well-paying occupations. I prefer the variable PEOPLE for three reasons: (1) is empirically grounded, i.e., it is informed by the factor analysis results, (2) it accounts for more variance in the models (as measured by BIC), and (3) it has greater power to explain sex differences in the estimated coefficient of EARNINGS.

included and does not increase with the number of alternatives (J), which is very large in this analysis. The conditional logit model is therefore a parsimonious model that allows the joint estimation of the influence of many characteristics on the choice among many alternative outcomes. This property makes the model attractive for the study of sex differences in occupational choice (Boskin, 1974; Hoffman and Duncan, 1988) where much information about the separation of men and women is lost with the aggregation of outcomes (Bielby and Baron, 1986; Petersen and Morgan, 1995; Tomaskovic-Devey, 1993; Tomaskovic-Devey and Skaggs, 2002). This method could be fruitfully applied to job-level data if both individual attainment and structural characteristics were measured at that level of detail. For this analysis I am constrained to model sex segregation at the occupation level since this is the greatest level of detail available in the NSCG data.

To test the hypotheses that occupational characteristics appeal, or are assigned, to workers differentially by sex, I model only the interaction between SEX and each occupational characteristics in a model that controls for the marginal distribution of recent college graduates across occupational categories. The marginal distribution of the cohort of new labor force entrants is modeled using a set of 135 occupation dummy variables, of which 134 identify the most popular detailed occupational categories among 95% of the NSCG respondents and a single residual occupational indicator captures the occupational distribution of the remaining 5% of the sample.[8] Without such controls for the marginal occupational distribution, disproportionate representation of male and female workers in a few very large occupational categories would bias the estimated sex gap in the association between occupational characteristics and occupational attainment. In the absence of controls, the estimated sex-specific coefficients would be weighted heavily by the occupational characteristics associated with the large categories regardless of whether the predominance of employment in those categories was due to the popularity of the characteristics of the aggregated jobs or was an artifact of the occupational classification scheme.[9]

In the estimated models, a significant SEX-interaction coefficient represents a significant sex disparity in the association between a covariate and the odds of employment net of the marginal occupational distribution. Further, given the effects-coding for SEX, the estimated coefficient indicates the female-specific effect of the occupational characteristics on the odds of occupational placement, the male-specific effect is equal to -1 times the estimated effect for females (Powers and Xie, 2000), and the estimated gender gap is equal to two times the absolute value of the female-specific

[8] Ideally, the model would include an estimated effect for each of the 292 occupational categories in the choice set. Insufficient frequencies in many of the occupational categories, however, prohibit modeling the full marginal distribution.

[9] The model specification I use is also preferable to the alternative of modeling the main effects of the occupational characteristics and allowing the interaction with sex to represent the deviation of the female effect from the male effect. In that approach, the estimated main effects of each occupational characteristic would be driven by the influence of the occupational coding scheme and the clumping of individuals into very large occupational categories.

coefficient. The results of the estimated models, therefore, bear directly on the hypotheses about sex differences without requiring any postestimation calculations.

This analysis focuses on the changes in the magnitude of the estimated coefficient for the SEX*EARNINGS interaction in the context of controls for the (sex-specific) effects of other occupational characteristics in the model of occupational attainment. The estimated coefficient for the SEX*EARNINGS interaction represents the sex gap in the association between occupational placement and average occupational earnings, i.e., the sex-segregation of occupations that result in women's greater likelihood of employment in occupations with relatively low average earnings. I test the research hypothesis by observing if the inclusion of other occupational characteristics in models of occupational attainment reduces the magnitude and significance of the estimated coefficient of the SEX*EARNINGS interaction. For simplicity, I refer to the interaction between SEX and a covariate by the name of the covariate only.

5. Results

5.1. Occupational characteristics and sex differences in occupational placement

Table 2 presents model goodness-of-fit statistics and estimated coefficients from simple descriptive models that include each sex-by-occupational characteristic interaction separately and from the full model that includes all sex-by-occupational characteristic interactions. All models control for the full set (excluding one) of occupational category indicators. The estimated coefficient of EARNINGS (i.e., $b_{\text{SEX*EARNINGS}}$) in the descriptive EARNINGS model represents the marginal sex difference in the association between occupational earnings and occupational attainment. Consistent with past research, the b_{EARNINGS} of -0.034 indicates that women are less likely on average to be employed in relatively high-paying occupations. More concretely, the model estimates a 6.6% ($1 - \exp(2 \times -0.034) = 0.066$) female deficit in the odds of employment for a \$1000 increment in the earnings differential between occupations. The practical significance of the marginal sex gap is evident at more consequential levels of earning disparities. For example, given two occupations for which the average annual earnings differ by \$10,000, the odds of employment in the higher-paying occupation are 49% less for women than for men ($1 - \exp(2 \times -0.034 \times 10) = 0.493$). This is the baseline estimate of the sex disparity in occupational attainment that I hypothesize is explained by its collinearity with sex differences in the other correlates of occupational placement. Estimated sex differences in the attainment of other occupational characteristics are represented by the sex-interaction coefficients from the remaining descriptive models presented in Table 2.

The coefficient of MAJOR reflects interesting sex differences in the accumulation and/or utilization of human capital. The negative value of b_{MAJOR} indicates that women are less likely than men to follow the normative major-occupation paths. The sex difference in MAJOR reflects two mutually exclusive segregation processes: one occurring during college and one occurring at the transition to the labor force.

Table 2
Model goodness-of-fit statistics and estimated coefficients from descriptive and full conditional logit model of occupational attainment

Covariate	SEX*x_k Descriptive models					Full model	
	Model χ^2	(df)	Pseudo R^2	$b_{k*\text{SEX}}$	SE ($b_{k*\text{SEX}}$)	$b_{k*\text{SEX}}$	SE ($b_{k*\text{SEX}}$)
Occupational earnings							
EARNINGS	26506.61	(134)	0.185	−0.034	(0.001)***	−0.016	(0.002)*
Major-occupation connections							
MAJOR	26596.51	(134)	0.186	−0.831	(0.027)***	−0.692	(0.028)***
Occupational characteristics							
Demand for sex-typed abilities							
VERBAL	25661.13	(134)	0.179	−0.066	(0.013)***	0.163	(0.031)***
QUANTITATIVE	25816.96	(134)	0.180	−0.111	(0.008)***	−0.058	(0.014)***
PHYSICAL	25641.47	(134)	0.179	−0.034	(0.014)*	0.077	(0.030)***
Specific vocational preparation							
JOB ZONE	25729.49	(134)	0.180	−0.061	(0.006)***	0.074	(0.012)***
Work–family compatibility							
PARTTIME	26520.40	(134)	0.185	2.692	(0.093)***	1.032	(0.151)***
FAMFRIEND	25695.72	(134)	0.180	1.533	(0.200)***	2.622	(0.247)***
Types of work: Intrinsic and extrinsic rewards							
INTRINSIC	25910.38	(134)	0.181	−0.188	(0.011)***	−0.075	(0.042)
AUTHORITY	25652.46	(134)	0.179	0.101	(0.025)***	0.208	(0.030)***
EXTRINSIC	26049.17	(134)	0.182	0.238	(0.012)***	−0.285	(0.044)***
Types of work: Work with people vs. work with things							
PEOPLE	26573.29	(134)	0.186	0.321	(0.011)***	0.141	(0.018)***
THINGS	26354.13	(134)	0.184	−0.361	(0.014)***	−0.044	(0.025)
Working conditions							
BAD CONDITIONS	25719.42	(134)	0.180	−0.140	(0.015)***	−0.340	(0.035)***
						Model χ^2	28462.79
						(df)	(147)
						Pseudo R^2	0.199

Note. All models include 134 dummy variables that control for the marginal distribution of NSCG respondents across the 292 occupational categories in the choice set. Pseudo R^2 is defined as $1 - L_1/L_0$, where L_1 is the log likelihood of the specified model and L_0 is the log likelihood of the model specified without any explanatory variables (Stata Corporation, 2003).

* $p < .05$.

*** $p < .001$.

The sex difference in the estimated effect of MAJOR could be due to sex segregation of college majors, i.e., that men are more likely than women to have majored in fields that have strong links with occupations in the labor market (e.g., engineering). The sex difference in major also could be due to within-major sex differences in employment patterns, i.e., that among graduates from a given major, women are less likely

to gain employment in a "linked" occupation. Both of these processes are controlled by the inclusion of MAJOR in the multivariate models.

Sex differences in the marginal effects of sex-typed abilities on occupational placement are as hypothesized with the exception of VERBAL. Despite the consistent female advantage in tests of verbal abilities, women are less likely than men to gain employment in occupations with high demands for verbal abilities. As hypothesized, however, occupational demands for QUANTITATIVE cognitive skills and for PHYSICAL exertion are associated with a female deficit in occupational attainment.

Without controls for other occupational characteristics, the sex-interaction coefficients for the other occupational characteristics are consistent with most of the hypothesized sex differences in preferences. Women are employed in occupations with lesser requirements for specialized training (JOB ZONE) relative to the occupations attained by men. The significantly positive coefficients for both measures of work–family compatibility are consistent with women's hypothesized preference for work that is compatible with the demands of their familial roles. Women's employment odds are also higher than those of men for occupations that require working with people (PEOPLE), but the negative coefficients for THINGS and BAD CONDITIONS are consistent with the hypothesized dearth of females in occupations that involve working with things and in unpleasant conditions. As predicted by the work values literature, men are more likely to be allocated to occupations that provide extrinsic rewards. But other descriptive results are inconsistent with the literature: in the bivariate context, women are significantly less likely than men to gain employment in occupations that provide intrinsic rewards and they are more likely to be employed in occupations that provide access to positions of AUTHORITY.

The character of the relationships between occupational placement, sex and most of the occupational characteristics is unchanged by the inclusion of the complete set of covariates in the full model. The magnitude of the estimated coefficients is affected, but for most of the covariates the direction and significance of the associations are robust to the change in model specification. The exceptions to this pattern include the estimated effects of INTRINSIC and THINGS, which become insignificant, and VERBAL, PHYSICAL DEMANDS, and JOB ZONE which become significantly positive in the context of the full set of occupational characteristics. For VERBAL, this change brings the estimated coefficient in line with expectations informed by the literature on ability sex-typing: demands for verbal abilities are associated with a greater likelihood of employment among women than men. The positive female-specific coefficients for PHYSICAL and JOB ZONE, however, are inconsistent with supply- and demand-side explanations and with the results of previous studies that have focused on SVP (Tam, 1997; Tomaskovic-Devey and Skaggs, 2002). The incongruity is likely attributable to the differences in model specification, i.e., that the full set of variables used in this analysis extends beyond that used in other studies, and in the populations studied, i.e., that this study focuses on college-educated individuals. The positive female-specific coefficients for these covariates indicate that net of the joint influence of human capital investments and the other occupational characteristics, women are more likely than men to gain employment in occupations that demand physical abilities and specific vocational training.

5.2. Explaining sex differences in the attainment of high-paying occupations

The inclusion of all of the covariates in the full model causes the estimated magnitude of b_{EARNINGS} to decline from −0.034 to −0.016, but to remain significant at the $\alpha = 0.001$ level. The difference between the descriptive and multivariate coefficient of EARNINGS provides an estimate of the total proportion of the sex gap in the attainment of well-paying occupations that is accounted for by the joint influence of all the covariates included in this analysis. By this measure 52.08% of the sex gap in the association between occupational earnings and occupational attainment is explained by sex differences in the utilization of college majors and in the allocation of workers to occupations that differ in their demand for sex-typed abilities and the other occupational characteristics included in this analysis. The collective explanatory power of these variables is thus substantial.

To measure the relative contribution of each covariate and to identify the most important factors in the generation of sex differences in occupational allocation I use the decomposition method introduced by Xie and Shauman (1998). This method uses variation in a focal estimated association, in this case b_{EARNINGS} (i.e., the estimated coefficient for the SEX*EARNINGS), under specific conditions to estimate the upper and lower bounds of the potential explanatory power of specific covariates included in the model. The first measure is a relatively conservative estimate based on the change in b_{EARNINGS} after an explanatory factor, x_k, is dropped from the full model. This "low" estimate, D_1, is defined as:

$$D_1 = b^{\text{F}-k}_{\text{EARNINGS}} - b^{\text{F}}_{\text{EARNINGS}}, \tag{2}$$

where $b^{\text{F}}_{\text{EARNINGS}}$ denotes the SEX*EARNINGS coefficient for the full model, and $b^{\text{F}-k}_{\text{EARNINGS}}$ denotes the SEX*EARNINGS coefficient for the model in which x_k is excluded from the full model. The second measure, D_2, is based on the change in b_{EARNINGS} after the addition of x_k to the baseline model that includes only SEX*EARNINGS, i.e., the descriptive model for earnings. This relatively liberal or "high" estimate of explanatory power is defined as:

$$D_2 = b^{0}_{\text{EARNINGS}} - b^{0+k}_{\text{EARNINGS}}, \tag{3}$$

where b^{0}_{EARNINGS} denotes the SEX*EARNINGS coefficient in the baseline model and $b^{0+k}_{\text{EARNINGS}}$ denotes the SEX*EARNINGS coefficient for the model with x_k added to the baseline model. The magnitude of the gap between the "low" and "high" estimates for any x_k will depend on both the explanatory power of x_k and the degree of collinearity between x_k and the other covariates included in the model. Note that a "low" estimate can be higher than a corresponding "high" estimate, and both can take negative values, in which case controlling a factor increases the estimated sex gap in the odds of employment in well-paying occupations (for a complete explanation of the method, see Xie and Shauman, 1998, 2003: Appendix B).

Table 3 presents the results of the decomposition analysis in terms of the absolute and percent change in the estimated female-specific coefficient of EARNINGS. This exercise clearly distinguishes the influential explanatory variables from those that have little or no explanatory power. The factors that have the greatest potential

Table 3
Attribution of explanatory power to individual explanatory factors, expressed as the magnitude and percent change in $b_{\text{SEX*EARNINGS}}$

	Absolute change in $b_{\text{SEX*EARNINGS}}$		Percent change in $b_{\text{SEX*EARNINGS}}$	
	Low (D_1)	High (D_2)	Low (D_1)	High (D_2)
All factors	−0.018		52.08	
Major-occupation connections				
MAJOR	−0.004	−0.006	11.65	17.70
Occupational characteristics				
Demand for sex-typed abilities				
VERBAL	0.004	0.018	−11.25	−52.50
QUANTITATIVE	0.000	0.000	−0.53	−0.58
PHYSICAL	0.000	0.005	0.19	−15.17
Specific vocational preparation				
JOB ZONE	0.002	0.012	−4.60	−35.18
Work–family compatibility				
PARTTIME	−0.004	−0.014	13.04	40.54
FAMFRIEND	0.001	0.008	−2.17	−23.45
Types of work: Extrinsic rewards				
INTRINSIC	0.000	0.003	−0.36	−8.44
AUTHORITY	−0.001	0.001	2.24	−1.78
EXTRINSIC	−0.002	0.001	7.09	−3.14
Types of work: Social rewards/work with people vs. work with things				
PEOPLE	−0.004	−0.007	12.41	21.49
THINGS	0.000	−0.002	0.59	5.59
Working conditions				
BAD CONDITIONS	−0.002	0.006	4.88	−18.02

Note. The entries represent the portion of the sex gap in occupational earnings that is explained by each occupational characteristic. The first estimate, labeled "low" (D_1), is based on the change in the coefficient of SEX*EARNINGS after an occupational characteristic is dropped from the full model. The second estimate, labeled "high" (D_2), is based on the change in the coefficient of SEX*EARNINGS when an occupational characteristic is added to the model that includes only SEX*EARNINGS.

influence on the sex gap in the association between occupational attainment and earnings are the measures of human capital investment and utilization (MAJOR), and the measures of occupational availability of part-time work (PARTTIME), potential for extrinsic rewards (EXTRINSIC) and demand for working with and caring for people (PEOPLE).

The sex gap in the attainment of well-paying jobs estimated by the baseline model (the bivariate model that includes only the SEX*EARNINGS interaction) is among men and women with the same level of educational attainment and average number of years since degree completion. These controls for human capital investments are clearly inadequate for studies of sex differences since controlling for MAJOR explains between 11.65 and 17.70% of the remaining marginal sex difference in the association

between occupational earnings and attainment. The "low" estimate indicates that even after accounting for the level of educational attainment, years of labor force experience, and the influence of all of occupational characteristic measures, sex differences in college major account for almost 12% of the sex gap in EARNINGS. The sex segregation of college majors thus has a significant influence on the occupational allocation of men and women, but this analysis cannot distinguish the extent to which this influence is exogenous and/or endogenous to pre-college supply- and demand-side influences on the choice of major.

A significant portion of the sex gap in the association between occupational earnings and occupational placement is attributable to the disproportionate allocation of women to occupations in which flexible work schedules in the form of part-time employment are relatively available. Since the prevalence of part-time workers, PARTTIME, is negatively associated with the average earnings of full-time workers (see Table 1), the disproportionately high female placement in occupations associated with such flexible work scheduling is estimated to explain up to 40.5% of the sex gap in occupational earnings. The female advantage in employment in occupations that are relatively family friendly, as indicated by FAMFRIEND, does not help explain the sex gap in the attainment of employment in lucrative occupations.

The unequal distribution of men and women by types of work also helps explain a significant proportion of the association between sex, occupational earnings, and occupational attainment. In particular, women's relative absence from well-remunerated occupations is estimated to be highly collinear with their overrepresentation in occupations that emphasize working with people and their relative scarcity in occupations that emphasize extrinsic rewards. According to the conservative low estimate presented in Table 3, as much as 7% of the marginal magnitude of the estimate coefficient for the SEX*EARNINGS is attributable to women's lesser preference for, or allocation to, occupations that emphasize social status, recognition, and autonomy. The second measure of the extrinsic rewards, AUTHORITY, is estimated to have very limited power (at most 2.24%) to explain sex differences in the effect of EARNINGS.

Women's greater likelihood of employment in occupations that require working with people (PEOPLE) is estimated to account for between 12.4 and 21.5% of the female deficit in the association between occupational placement and pay. The segregation of men and women into differentially remunerated occupations is thus strongly associated with sex differences in the attainment of occupations that involve working with and caring for people. Two aspects of the decomposition estimates for PEOPLE are notable. First, the comparability of the low estimates for PEOPLE, MAJOR, and PARTTIME indicate that the people- and caring-skills dimension of occupational sex segregation has about as much influence as do MAJOR and PARTTIME on the sex gap in the association between occupational earnings and placement. Second, the robustness of the estimated influence of PEOPLE on b_{EARNINGS} in the full model, i.e., that D_1 and D_2 are both large and positive, shows that the concentration of women in low-paying occupations is directly related to their greater likelihood of entering occupations that require social and nurturance skills. The results of the decomposition analysis therefore echo the findings of previous research on nurturant skill demands and the sex gap in individual-level earnings (England, 1992; England and

Folbre, 1999; England et al., 1994; Kilbourne et al., 1994b) and provide further empirical evidence that is consistent with the cultural devaluation explanation of the association between occupational gender composition and pay.

The results of the decomposition analysis also highlight those occupational characteristics that, contrary to expectations, have no potential to explain women's relatively low probability of attaining lucrative occupations. In particular, sex disparities in the influence of neither occupational demand for cognitive abilities (especially VERBAL) nor for specific vocational training (JOB ZONE) help explain the disproportionate concentration of women in relatively low-paying occupations. As expected, the estimated coefficients in the full model show that demand for verbal abilities, a female-typed trait, is more positively associated with the occupational placement of women than men. Demand for verbal abilities is positively associated with average occupational earnings, however, so equalizing the distribution of men and women by this occupational characteristic would lead to significantly greater disparities in the attainment of employment in well-paying occupations. Similarly, since JOB ZONE is positively associated with both female employment (in the multivariate context) and occupational EARNINGS, equalizing the distribution of men and women by the occupational demand for specialized training is estimated to increase the observed sex gap in the association between earnings and occupational placement by at least 4.6%.

Finally, consistent with past research (Jacobs and Steinberg, 1990; Kilbourne et al., 1994b) for the full labor market, the decomposition results show that sex differences in the attainment of occupations that require PHYSICAL abilities or that must be performed under BAD CONDITIONS have little potential to help explain the sex gap in occupational earnings for college graduates. For example, women are less likely than men to gain employment in physically demanding occupations, but since this occupational characteristic is negatively associated with EARNINGS equalizing the allocation of workers on this dimension would only exacerbate the economic dimension of occupational sex segregation.

5.2.1. Summary

The results of this analysis provide empirical evidence of three processes that contribute to sex inequality at labor market entry. First, men and women invest in different types of education prior to entry into the labor market and this disparity in human capital investments accounts for a significant proportion of the sex gap in the odds of employment in lucrative occupations among this cohort of recent college graduates. Second, among recent labor force entrants who have very similar human capital investments, i.e., baccalaureates with the same majors, women and men enter different types of occupations. Third, these sex differences in the distribution of workers across occupational characteristics coupled with the differential remuneration of these characteristics explain as much as 41% of the sex gap in the association between occupational earnings and attainment, i.e., that women are over-represented in low-paying occupations and under-represented in high-paying occupations. The occupational characteristics that have the strongest influence on sex differences in the attainment of high-paying occupational placement are the indicators of work

schedule flexibility, occupational opportunities for extrinsic rewards, and demand for social and caring skills.

Although my empirical results strongly suggest that mechanisms related to premarket human capital investments and a limited set of occupational characteristics are responsible for the occupational segregation which is so consequential for the sex gap in earnings, this analysis cannot distinguish the causal mechanisms that underlie the estimated coefficients. For example, the considerable explanatory power of MAJOR implies that a significant amount of occupational segregation is generated by educational segregation. But the estimated relationship also reflects, at least in part, the influence of early life course sex differences in occupational preferences that may guide choice of major. Specifying this type of life course career planning and formation is beyond the scope of the data and methods used here. Similarly, this analysis cannot decompose the estimated explanatory power of PARTTIME, EXTRINSIC, and PEOPLE into the portions attributable to (1) supply-side sex differences in preferences for work schedule flexibility and types of work and (2) demand-side market forces and actions by employers that produce the sex-typed allocation of male and female workers. Identifying the mechanisms that produce the observed associations will require better and different types of data (Reskin, 2003).

6. Conclusion

The relationship between occupational segregation and the earnings gap has long been common knowledge among students of gender inequality. We know that women and men enter different occupations that are differentially remunerated. What has not been established, however, is which occupational characteristics are key to the generation of this between-occupation component of the earnings gap. The primary contribution of this study is that it begins to fill this knowledge gap by identifying the occupational characteristics that are associated with both the remuneration of work and the gendered sorting of college-educated workers at the early stages of their careers. Furthermore, by quantifying the explanatory power of each covariate considered, this analysis distinguishes the most influential characteristics at the intersection of the allocation and compensation processes.

The results of the conditional logit model attest to the extent of occupational segregation among men and women who have the same level of educational attainment: Eleven of the 13 non-pecuniary occupational characteristics included in this analysis have significant sex interaction effects in the full conditional logit model of occupational placement. Together these differences account for as much as 52% of the sex gap in the odds of employment in high-paying occupations. Yet, just four covariates—MAJOR, PARTTIME, EXTRINSIC, and PEOPLE—account for the majority of this explanatory power. Many of the occupational characteristics that are attained at unequal rates by male and female workers do not help explain the sex gap in the attainment of highly paid occupations either because they have no partial association with occupational earnings, or the current combination of the sex-typing and compensation favors women. The results presented here therefore direct research on the

between-occupation earnings gap to the investigation of allocation and remuneration mechanisms associated with a narrow set of influential factors: major field of study during college and the occupational availability of part-time employment, potential for extrinsic rewards, and requirements for people-oriented work.

This study makes a second contribution to the gender inequality literature by providing empirical evidence of the countervailing effects of sex-typing. Contrary to the cultural devaluation perspective, the results of this study show that "female" sex-typed occupational characteristics are not consistently devalued in the market. Some occupational characteristics that are disproportionately associated with the occupational attainment of women—such as the occupational demand for verbal skills—also are positively associated with average occupational earnings. Similarly, some characteristics that are stereotypically "male," and which prove to be more strongly associated with the occupational attainment of men than women—such as the demand for physical abilities or for quantitative skills—nevertheless are not positively associated with occupational pay rates. The positive explanatory power of the complete set of covariates considered here shows, however, that on balance the countervailing influences of sex-typing are detrimental to the market position of women. In other words, average pay in many of the occupations women tend to enter is higher than it might be because these occupations tend to require a valued skill: verbal abilities. But, this compensation gain is offset and surpassed by the tendency for these occupations to have characteristics that depress occupational pay rates such as the demand for people-oriented skills or the availability of part-time employment.

The results of this analysis have a number of implications for further research. First, they highlight the need for further investigation of the characteristics of occupations that influence worker allocation and compensation. The set of covariates examined here explain about half of the sex gap in the association between occupational attainment and earnings. The unexplained variance highlights the need for more precise measurement of both job placement and of the many aspects of jobs that may differentially affect the attainment of men and women. Second, there are systematic differences in the characteristics of the occupations entered by men and women. Whether these differences are generated by choice or allocation should be the focus of further analyses. Third, the significant impact of the sex segregation of college majors underscores the importance of controlling for human capital investments using detailed measures and furthermore highlights the fact that sex segregation and stratification in the labor force is the outcome of a life course process that begins in school (Davis, 1965; Jacobs, 1989, 1995; Peng and Jaffe, 1979; Polachek, 1978). Finally, the significance of the sex differences among individuals with similar educational credentials and employment experience highlights the continued existence of barriers to labor force equity. The magnitude of the differences is especially striking given that the selectivity of the sample used here generated conservative estimates of occupational segregation. To improve the generalizability of the results and to more accurately model the process of sex stratification, further research will need to expand upon this study both horizontally—by using data for the full range of labor force participants—and longitudinally—by examining the

cumulative impact of market and life course experiences that contribute to occupational segregation and the gender gap in pay.

Appendix A. Creation of scale measures of occupational characteristics with O*NET data

I used the results of a principal components factor analysis of O*NET data to guide the creation of measures of eight occupational characteristics that are hypothetically related to occupational sex segregation. The O*NET database includes over 220 variables that measure the characteristics of workers and occupations in six "content areas" (Boese et al., 2001): worker characteristics, worker requirements, experience requirements, occupational characteristics, occupational requirements, and occupation-specific information. Others have discussed the evolution of the O*NET from the DOT and the similarities between the two as data sources for measures of occupational characteristics (Hadden et al., 2003). The validity of the O*NET as a source of data measuring occupational characteristics is affirmed by a factor analysis of the full complement of O*NET variables (Hadden et al., 2003) that identifies the same general constructs as have been identified in prior analyses of various versions of DOT data (Cain and Treiman, 1981; Kilbourne et al., 1994b; Parcel and Mueller, 1983; Shu et al., 1996). Furthermore, less aggregated exploratory factor analyses (Hadden et al., 2003) identify some occupational characteristics that are particularly relevant to an analysis of occupational sex segregation.

To identify measures of hypothetically relevant occupational characteristics I replicated, with some modifications, the Hadden et al. (2003) factor analysis of O*NET variables within the conceptual sub-domains of worker abilities, worker values and interests, occupational work activities, and occupational work context. There are two modifications that differentiate my analysis from the analysis of Hadden et al. (2003). First, because the results of the prior analysis reveal considerable redundancy between the measures of worker values and interests and occupational work activities (e.g., both reveal underlying constructs that contrast people-oriented and thing-oriented work), I conduct one factor analysis for the combined set of variables in these sub-domains. I, therefore, conducted three separate principal components analyses of the variables measuring (1) worker abilities, (2) worker interests, values, and work activities, and (3) occupational work context. Second, I conducted the factor analysis after first collapsing the SOC occupation codes to equivalent 386 Census 3-digit occupation codes (Hadden et al. analyze the data for the full set of 900 SOC occupation categories provided in the O*NET).

The O*NET element variables measuring worker abilities and occupational work activities are measured on multiple dimensions. Both sets of variables are assessed in terms of the level required (a 7-point scale) and the importance of the ability or activity to overall job performance (a 4-point scale). The two dimensions are highly correlated for all variables with multiple scales. For each variable, I combined the measurement scales by first rescaling each to a 0 to 1 metric and then averaging the two scales. For the elements in each of the three sub-domains analyzed for this study, I identified latent constructs using a principal factor analysis with a promax rotation (using Stata's "factor" command). Factors identified by the analysis are retained and used to guide the creation of scale variables if conventional criteria for share-of-variance (eigenvalue >1) and substantive interpretability are satisfied. In general, I created scale variables by averaging (without weights) the normalized values (Z scores) of the elements that have factor loadings of magnitude 0.7 or greater. Deviations from this general procedure are described below. Appendix Table 3 reports the O*NET element variables included in each scale measure created as well as the O*NET identifying information and factor loadings for each.

The factor analysis of the 52 variables measuring worker abilities clearly identifies two separate underlying constructs: cognitive abilities and physical abilities. These two factors have very high eigenvalues (18.434 and 13.762, respectively) and cumulatively explain 62% of the variance among the 52 elements. Only elements measuring verbal cognitive abilities had factor loadings of 0.7 or greater for the cognitive abilities construct. Because of the hypothesized importance (for occupational sex segregation) of occupational requirements for both verbal and quantitative abilities, I chose to retain the elements measuring quantitative ability and to create two separate measures of cognitive ability. VERBAL is the composite of

Appendix Table 1
Partial correlation for EARNINGS and each covariate and bivariate correlations for all variables measuring occupational characteristics

	Partial correlation with EARNINGS	Bivariate correlation												
		EARNINGS	VERBAL	QUANTITATIVE	PHYSICAL	JOB ZONE	PARTTIME	FAMFRIEND	INTRINSIC	AUTHORITY	EXTRINSIC	PEOPLE	THINGS	BAD CONDITIONS
EARNINGS		1.000												
VERBAL	0.141*	0.547***	1.000											
QUANTITATIVE	0.112	0.510***	0.576***	1.000										
PHYSICAL	0.018	−0.217***	−0.430***	−0.314***	1.000									
JOB ZONE	0.120*	0.607***	0.557***	0.383***	−0.316***	1.000								
PARTTIME	−0.357***	−0.560***	−0.202**	−0.406***	0.052	−0.343***	1.000							
FAMFRIEND	0.061	0.273***	0.312***	0.109	−0.181**	0.308***	−0.187**	1.000						
INTRINSIC	−0.161**	0.593***	0.679***	0.385***	−0.286***	0.798***	−0.238***	0.289***	1.000					
AUTHORITY	−0.120*	0.172**	0.248***	0.258***	−0.106	0.189**	−0.200**	0.137*	0.204**	1.000				
EXTRINSIC	0.301***	0.664***	0.693***	0.447***	−0.345***	0.798***	−0.292***	0.288***	0.944***	0.252***	1.000			
PEOPLE	−0.012	0.025	0.503***	−0.096	−0.168**	0.168**	0.364***	0.126*	0.320***	0.104	0.291***	1.000		
THINGS	0.031	−0.059	−0.475***	−0.163**	0.626***	−0.158**	−0.269***	−0.089	−0.232***	−0.148*	−0.289***	−0.500***	1.000	
BAD CONDITIONS	0.044	−0.206***	−0.465***	−0.321***	0.805***	−0.299***	−0.031	−0.195**	−0.290***	−0.058	−0.369***	−0.254***	0.661***	1.000

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

Appendix Table 2
Distribution of NSCG respondents by college major and sex

Major field	Full sample	Males	Females	Female among degree recipients
All fields	12,606	7453	5153	40.88
Agriculture, Natural Resources and Forestry	1.48	2.04	1.24	34.41
Architecture and Environmental design	1.10	1.41	0.60	22.30
Business	22.74	21.09	24.20	43.49
Marketing/distribution	0.51	0.55	0.45	35.94
Journalism, Communications	4.32	3.30	5.80	54.96
Computer and information sciences	10.11	10.63	7.65	30.93
Education	5.70	2.70	9.30	66.62
Engineering	23.77	33.48	7.63	13.12
Foreign languages	0.53	0.30	0.91	70.15
Health and medical	4.77	1.49	8.46	72.55
Home economics	0.52	0.08	1.13	89.23
Law	0.21	0.13	0.25	50.00
English	1.47	0.78	2.45	68.11
Liberal studies	0.81	0.56	1.34	67.65
Biology	3.10	2.59	4.83	63.68
Math	1.97	1.87	2.29	47.58
Philosophy and Religious studies	0.59	0.89	0.25	17.57
Physical sciences	3.29	3.37	2.00	24.82
Psychology	2.84	1.66	4.70	67.60
Protective services	1.27	1.19	1.30	41.88
Social work, Public administration	0.98	0.43	1.73	72.36
Economics	1.34	1.42	1.18	36.09
History	1.03	1.29	0.78	30.77
Sociology	1.19	0.74	1.82	62.67
Political science, International relations	2.17	2.17	2.10	39.56
Other social sciences	0.74	0.64	0.78	43.01
Commercial art, Visual and performing arts	2.90	2.01	3.90	55.07
Other fields	1.12	1.19	0.95	34.75

four elements measuring occupational requirements for workers' oral comprehension, written comprehension, oral expression, and written expression. QUANTITATIVE averages the scales measuring occupational demand for mathematical reasoning and facility with numbers. PHYSICAL combines 13 measures of occupational demand for physical strength (multilimb coordination, response orientation, rate control, reaction time, speed of limb movement, static strength, dynamic strength, and stamina), flexibility (extent flexibility), balance and coordination (gross body coordination, gross body equilibrium), and sensory abilities (peripheral vision and depth perception).

The factor analysis of the combined worker values, worker interests, and occupational work activities yielded six factors. Three of these factors have theoretical relevance for the analysis of occupational sex segregation. The variable PEOPLE averages the normalized scores for O*NET variables measuring the degree to which the jobs in an occupational category involve working with, communicating with, teaching, providing services and/or caring for coworkers, customers or patients. THINGS combines measures of the degree to which jobs in an occupational category involve practical, hands-on problem solving and/or the inspection, control, repair and maintenance of tangible materials, equipment or structures.

The third factor identified in the combined analysis of the worker interests and values and occupational work activities resembles a factor Hadden et al. (2003) label "self-realization." This factor has large factor loadings for measures of worker values for ability utilization, achievement, recognition, social status, work

Appendix Table 3
O*NET element names, numbers, and factor loadings for scale variables measuring occupational ability demands, types of work and working conditions

Factor scale and O*NET element name	O*NET element	Factor loading
Abilities		
VERBAL		
Oral comprehension	1.A.1.a.1	−0.84
Written comprehension	1.A.1.a.2	−0.76
Oral expression	1.A.1.a.3	−0.84
Written expression	1.A.1.a.4	−0.80
QUANTITATIVE		
Mathematical reasoning	1.A.1.c.1	−0.64
Number facility	1.A.1.c.2	−0.48
PHYSICAL		
Multilimb coordination	1.A.2.b.2	0.87
Response orientation	1.A.2.b.3	0.82
Rate control	1.A.2.b.4	0.80
Reaction time	1.A.2.c.1	0.84
Speed of limb movement	1.A.2.c.3	0.87
Static strength	1.A.3.a.1	0.80
Dynamic strength	1.A.3.a.3	0.81
Stamina	1.A.3.b.1	0.77
Extent flexibility	1.A.3.c.1	0.83
Gross body coordination	1.A.3.c.3	0.80
Gross body equilibrium	1.A.3.c.4	0.81
Peripheral vision	1.A.4.a.5	0.79
Depth perception	1.A.4.a.6	0.82
Work types and working conditions		
PEOPLE		
Social	1.B.1.d	−0.70
Social service	1.B.2.d.2	−0.78
Assisting and caring for others	4.A.4.a.5	−0.85
THINGS		
Realistic	1.B.1.a	0.75
Inspecting equipment, structures, or material	4.A.1.b.2	0.83
Controlling machines and processes	4.A.3.a.3	0.72
Repairing and maintaining mechanical equipment	4.A.3.b.4	0.70
INTRINSIC		
Ability utilization	1.B.2.a.1	0.89
Achievement	1.B.2.a.2	0.90
Variety	1.B.2.b.3	0.79
Creativity	1.B.2.f.1	0.85
EXTRINSIC		
Recognition	1.B.2.c.2	0.91
Social status	1.B.2.c.4	0.82
Responsibility	1.B.2.f.2	0.88
Autonomy	1.B.2.f.3	0.84

(*continued on next page*)

Appendix Table 3 (*continued*)

Factor scale and O*NET element name	O*NET element	Factor loading
Abilities		
BAD CONDITIONS		
Very hot or cold temperatures	4.C.2.b.1.b	0.84
Extremely bright or inadequate lighting	4.C.2.b.1.c	0.85
Exposed to contaminants	4.C.2.b.1.d	0.82
Cramped work space, awkward positions	4.C.2.b.1.e	0.85
Spend time keeping or regaining balance	4.C.2.d.1.f	0.81
Spend time bending or twisting the body	4.C.2.d.1.h	0.82

variety, creativity, responsibility, and autonomy. In relation to the literature on gender differences in work values (Beutel and Marini, 1995; Bridges, 1989; Herzog, 1982; Johnson, 2002; Konrad et al., 2000; Lueptow, 1980), this factor lacks face validity because it combines elements that are considered measures of intrinsic rewards of work with elements that appear to measure extrinsic rewards. I therefore created two measures from the elements that load on this factor. EXTRINSIC averages the normalized scores measuring the degree to which an occupation provides workers with social status, opportunities to receive recognition for the work they do, responsibility to make work-related decisions, and to work autonomously (Boese et al., 2001). Similarly, the relative level of intrinsic rewards offered by each occupation is measured with the scale INTRINSIC which averages the normalized scores of O*NET elements measuring the degree to which an occupation provides workers with opportunities to make use of their individual abilities, to get a feeling of accomplishment, to do a variety of tasks, and to be creative in their approach to work. Although EXTRINSIC and INTRINSIC are highly correlated with each other, I find that the differences in the association of each with gender are sufficient to justify their inclusion as separate variables in this analysis.

Finally, parallel to the results of Hadden et al. (2003), the factor analysis of the 31 elements in the work context sub-domain of the O*NET database identifies two principal factors. The first identifies elements that coalesce as indicators of "socially challenging" work conditions (Hadden et al., 2003). As a separate scale variable, this factor is found to be highly collinear with the variable PEOPLE, but the elements that load on this factor do not have factor loadings greater than 0.7 in an analysis of the combined work context and work values and interests elements. Furthermore, preliminary multivariate analyses that included both variables showed that the variable PEOPLE has more power as an explanation of occupational sex segregation. This factor is therefore not retained in the final analyses. The second factor underlying the work context variables identifies physically challenging work conditions. This factor is retained as the variable BAD CONDITION. BAD CONDITION averages the frequency of exposure to very hot or very cold temperatures; conditions that are either extremely bright or provide inadequate light; contaminants such as pollutants, gases, dust or odors; cramped workspaces; and time spent keeping or regaining balance or bending and twisting.

Appendix B. Major-occupation connections for NSCG respondents earning bachelors degrees in 1975–1993 by college major

1 Agriculture, Natural Resources and Forestry
077 Agricultural and food scientists
079 Forestry and conservation scientists
473 Farmers, except horticultural

2 Architecture and Environmental design
043 Architects
217 Drafting occupations

Appendix B (*continued*)

3 Business
005 Administrators and officials, public ad
007 Financial managers
008 Personnel and labor relations managers
009 Purchasing managers
013 Managers, marketing, advertising, and public relations
014 Administrators, education and related fields
017 Managers, food serving and lodging establishments
018 Managers, properties and real estate
021 Managers, service organizations, n.e.c.
022 Managers and administrators, n.e.c.
023 Accountants and auditors
024 Underwriters
025 Other financial officers
026 Management analysts
027 Personnel, training, and labor relation
029 Buyers, wholesale and retail trade except farm products
033 Purchasing agents and buyers, n.e.c.
036 Inspectors and compliance officers, except construction
037 Management-related occupations, n.e.c.
064 Computer systems analysts and scientist
065 Operations and systems researchers and analysts
067 Statisticians
166 Economists
213 Electrical and electronic technicians
229 Computer programmers
243 Supervisors and proprietors, sales occupations
253 Insurance sales occupations
254 Real estate sales occupations
255 Securities and financial services sales
256 Advertising and related sales occupations
259 Sales representatives, mining, manufacturing
274 Sales workers, other commodities
276 Cashiers
303 Supervisors, general office
307 Supervisors, distribution, scheduling,
313 Secretaries
316 Interviewers
336 Records clerks
337 Bookkeepers, accounting, and auditing clerks
354 Postal clerks, exc. mail carriers
355 Mail carriers, postal service
363 Production coordinators
364 Traffic, shipping, and receiving clerks
375 Insurance adjusters, examiners, and inv
376 Investigators and adjusters, except insurance
385 Data-entry keyers
503 Supervisors, mechanics, and repairers
567 Carpenters
628 Supervisors, production occupations
804 Truck drivers

(*continued on next page*)

Appendix B (*continued*)

4 Marketing/distribution
No major-occupation connections

5 Journalism, Communications
184 Technical writers
187 Actors and directors
195 Editors and reporters
197 Public relations specialists

6 Computer and information sciences
064 Computer systems analysts and scientist
065 Operations and systems researchers and
229 Computer programmers
309 Peripheral equipment operators

7 Education
154 Postsecondary teachers, subject not specified
155 Teachers, pre-kindergarten and kindergarten
156 Teachers, elementary school
157 Teachers, secondary school
158 Teachers, special education
159 Teachers, n.e.c.
468 Child care workers, n.e.c.

8 Engineering
043 Architects
044 Aerospace
045 Metallurgical and materials
046 Mining
047 Petroleum
048 Chemical
049 Nuclear
053 Civil
055 Electrical and electronic
056 Industrial
057 Mechanical
058 Marine and naval architects
064 Computer systems analysts and scientist
213 Electrical and electronic technicians
215 Mechanical engineering technicians
216 Engineering technicians, n.e.c.
217 Drafting occupations
226 Airplane pilots and navigators
258 Sales engineers
628 Supervisors, production occupations
696 Stationary engineers

9 Foreign languages
No major-occupation connections

10 Health and medical
015 Managers, medicine and health
095 Registered nurses
096 Pharmacists
099 Occupational therapists

Appendix B (*continued*)

103 Physical therapists
203 Clinical laboratory technologists and technicians
206 Radiologic technicians
447 Nursing aides, orderlies, and attendant

11 Home economics
No major-occupation connections

12 Law
No major-occupation connections

13 English
No major-occupation connections

14 Liberal studies
No major-occupation connections

15 Biology
073 Chemists, except biochemists
076 Physical scientists, n.e.c.
078 Biological and life scientists
083 Medical scientists
097 Dietitians
203 Clinical laboratory technologists and technicians
216 Engineering technicians, n.e.c.
Chemical technicians

16 Math
No major-occupation connections

17 Philosophy and Religious studies
176 Clergy

18 Physical sciences
073 Chemists, except biochemists
075 Geologists and geodesists

19 Psychology
163 Counselors, educational and vocational
167 Psychologists
174 Social workers

20 Protective services
418 Police and detectives, public service

21 Social work, Public administration
174 Social workers

22 Economics
No major-occupation connections

23 History
No major-occupation connections

24 Sociology
No major-occupation connections

25 Political science, International relations
No major-occupation connections

(*continued on next page*)

Appendix B (*continued*)

26 Other social sciences
No major-occupation connections

27 Commercial art, Visual and performing arts
185 Designers
186 Musicians and composers
188 Painters, sculptors, craft-artists, and artist printmakers

28 Other fields
No major-occupation connections

Appendix C. Occupations coded as requiring authoritative social skills

003 Legislators
004 Chief executives and general administrators, public admin.
005 Administrators and officials, public administration
006 Administrators, protective services
007 Financial managers
008 Personnel and labor relations managers
009 Purchase managers
013 Managers, marketing, advertising, and public relations
014 Administrators, education and related fields
015 Managers, medicine and health
016 Postmasters and mail superintendents
017 Managers, food serving and lodging establishments
018 Managers, properties and real estate
019 Funeral directors
021 Managers, service organizations, n.e.c.
022 Managers and administrators, n.e.c.
023 Accountants and auditors
243 Supervisors and proprietors, sales occupations
303 Supervisors, general office
304 Supervisors, computer equipment operators
305 Supervisors, financial records processing
306 Chief communications operators
307 Supervisors; distribution, scheduling, and adjusting clerks
413 Supervisors, firefighting and fire prevention occupations
414 Supervisors, police and detectives
415 Supervisors, guards
433 Supervisors, food preparation and service occupations
448 Supervisors, cleaning and building service workers
456 Supervisors, personal service occupations
475 Managers, farms, except horticultural
476 Managers, horticultural specialty farms
477 Supervisors, farm workers
485 Supervisors, related agricultural occupations
494 Supervisors, forestry, and logging workers
497 Captains and other officers, fishing vessels
503 Supervisors, mechanics and repairers
553 Supervisors; brickmasons, stonemasons, and tile setters

Appendix C (*continued*)

554 Supervisors, carpenters and related workers
555 Supervisors, electricians and power transmission installers
556 Supervisors; painters, paperhangers, and plasterers
557 Supervisors; plumbers, pipefitters and steamfitters
558 Supervisors, construction n.e.c.
613 supervisors, extraction occupations
628 Supervisors, production occupations
803 Supervisors, motor vehicle operators
828 Ship captains and mates, except fishing boats
843 Supervisors, material moving equipment operators

References

Almquist, E.M., Angrist, S.S., Mickelsen, R., 1980. Women's career aspirations and achievements: College and seven years after. Sociology of Work and Occupations 7, 367–384.

Angrist, S.S., Almquist, E.M., 1975. Careers and Contingencies. Dunellen, New York.

Angrist, S.S., Almquist, E.M., 1993. The Carnegie Mellon Class of 1968: Families, careers, and contingencies. In: Hulbert, K.D., Schuster, D.T. (Eds.), Women's Lives through Time: Educated American Women of the Twentieth Century. Jossey-Bass, San Francisco, CA.

Arnold, K.D., 1995. Lives of Promise: What Becomes of High School Valedictorians. Jossey-Bass, San Francisco, CA.

Bae, Y., Choy, S., Geddes, C., Sable, J., Snyder, T., 2000. Trends in Educational Equity for Girls and Women. NCES 2000-030. U.S. Department of Education, National Center for Education Statistics, Washington, DC.

Bauman, K.J., Graf, N.L., 2003. Educational Attainment: 2000. Census 2000 Brief C2KBR-24. U.S. Census Bureau, Washington, DC.

Becker, G.S., 1975. Human Capital: A Theoretical and Empirical Analysis with Special Reference to Education. University of Chicago Press, Chicago.

Becker, G.S., 1985. Human capital, effort, and the sexual division of labor. Journal of Labor Economics 3, S33–S58.

Becker, G.S., 1991. A Treatise on the Family. Harvard University Press, Cambridge, MA.

Beutel, A.M., Marini, M.M., 1995. Gender and values. American Sociological Review 60, 436–448.

Bianchi, S.M., 1995. Changing economic roles of women and men. In: Farley, R. (Ed.), State of the Union: America in the 1990s, Volume One: Economic Trends. Russell Sage Foundation, New York.

Bielby, W.T., Baron, J.N., 1986. Men and women at work: Sex segregation and statistical discrimination. American Journal of Sociology 91, 759–799.

Boese, R., Lewis, P., Frugoli, P., Litwin, K., 2001. Summary of O*NET 4.0 Content Model and Database. National Center for O*NET Development, Raleigh, NC.

Boskin, M.J., 1974. A conditional logit model of occupational choice. Journal of Political Economy 82, 389–398.

Bridges, J.S., 1989. Sex differences in occupational values. Sex Roles 20, 205–211.

Brown, C., 1980. Equalizing differences in the labor market. Quarterly Journal of Economics, 94.

Brown, C., Corcoran, M., 1997. Sex-based differences in school content and the male–female wage gap. Journal of Labor Economics 15, 431–465.

Bureau of Labor Statistics, 2003. Highlights of Women's Earnings in 2002. 972. Bureau of Labor Statistics, Washington, DC.

Cain, P.S., Treiman, D.J., 1981. The dictionary of occupational titles as a source of occupational data. American Sociological Review 46, 253–278.

Campbell, J.R., Hombo, C.M., Mazzeo, J., 2000. NAEP 1999 Trends in Academic Progress: Three Decades of Student Performance. National Center for Education Statistics, Washington, DC. NCES 2000-469.

Corcoran, M.E., Courant, P.N., 1985. Sex role socialization and labor market outcomes. American Economic Review 75, 275–278.
Correll, S.J., 2001. Gender and the career choice process: The role of biased self-assessments. American Journal of Sociology 106, 1691–1730.
Correll, S.J., 2004. Constraints into preferences: Gender, status, and emerging career aspirations. American Sociological Review 69, 93–113.
Davies, S., Guppy, N., 1997. Fields of study, college selectivity, and student inequalities in higher education. Social Forces 75, 1417–1438.
Davis, J.A., 1965. Undergraduate Career Decisions. Aldine, New York.
Daymont, T.N., Andrisani, P.J., 1984. Job preferences, college major, and the gender gap in earnings. The Journal of Human Resources 19, 408–428.
Duxbury, L.E., Higgins, C.A., 1991. Gender differences in work family conflict. Journal of Applied Psychology 76, 60–74.
Eccles, J.S., 1994. Understanding women's educational and occupational choices. Psychology of Women Quarterly 18, 585–609.
Eccles, J.S., Hoffman, L.W., 1984. Sex roles, socialization, and occupational behavior. Research in Child Development and Social Policy 1, 367–420.
Elliott, M., Parcel, T.L., 1996. The determinants of young women's wages: Comparing the effects of individual and occupational labor market characteristics. Social Science Research 25, 240–259.
England, P., 1992. Comparable Worth: Theories and Evidence. Aldine de Gruyter, New York.
England, P., Farkas, G., Kilbourne, B.S., Dou, T., 1988. Explaining occupational sex segregation and wages: Findings from a model with fixed effects. American Sociological Review 53, 544–558.
England, P., Folbre, N., 1999. The cost of caring. The Annals of the American Academy of Political and Social Science 561, 39–51.
England, P., Herbert, M.S., Kilbourne, B.S., Reid, L.L., Megdal, L.M., 1994. The gendered valuation of occupations and skills: Earnings in 1980 census occupations. Social Forces 73, 65–99.
England, P., Hermsen, J.M., Cotter, D.A., 2000. The devaluation of women's work: A comment on Tam. American Journal of Sociology 105, 1741–1760.
Felmlee, D.H., 1993. The dynamic interdependence of women's employment and fertility. Social Science Research 22, 333–360.
Filer, R.K., 1985. Male–female wage differences: The importance of compensating differentials. Industrial and Labor Relations Review 38, 426–437.
Filer, R.K., 1989. Occupational segregation, compensating differentials and comparable worth. In: Michael, R.T., Hartmann, H., O'Farrell, B. (Eds.), Pay Equity: Empirical Inquiries. National Academy Press, Washington, DC.
National Science Foundation, 1997. National Survey of College Graduates, 1993 [Computer file]. U.S. Department of Commerce, Bureau of the Census [Producer], Washington, DC.
Freeman, R.B., 1971. The Market for College-trained Manpower: A Study in the Economics of Career Choice. Harvard University Press, Cambridge, MA.
Freeman, R.B., 1976. The Overeducated American. Academic Press, New York.
Gerhart, B., 1990. Gender differences in current and starting salaries: The role of performance, college major, and job title. Industrial and Labor Relations Review 43, 418–433.
Gerson, K., 1985. Hard Choices: How Women Decide About Work, Career, and Motherhood. University of California Press, Berkeley, CA.
Gilligan, C., 1982. In a Different Voice. Harvard University Press, Cambridge, MA.
Glass, J., Camarigg, V., 1992. Gender, parenthood, and job–family compatibility. American Journal of Sociology 98, 131–151.
Grodsky, E., Pager, D., 2001. The structure of disadvantage: Individual and occupational determinants of the black–white wage gap. American Sociological Review 66, 542–567.
Hadden, W.C., Kravets, N., Muntaner, C., 2003. Descriptive dimensions of US occupations with data from the O*NET. Social Science Research 33, 64–78.
Hansen, J.-I.C., Collins, R.C., Swanson, J.L., Fouad, N.A., 1993. Gender differences in structure of interests. Journal of Vocational Behavior 42, 200–211.

Hauser, R.M., Warren, J.R., 1997. Socioeconomic indexes for occupations: A review, update, and critique. In: Raftery, A.E. (Ed.), Sociological Methodology. Blackwell, Cambridge, pp. 177–298.
Herzog, A.R., 1982. High school seniors' occupational plans and values: Trends in sex differences 1976 through 1980. Sociology of Education 55, 1–13.
Hoffman, S.D., Duncan, G.J., 1988. Multinomial and conditional logit discrete-choice models in demography. Demography 25, 415–427.
Jackman, M.R., 1999. Gender, violence, and harassment. In: Chafetz, J.S. (Ed.), Handbook of the Sociology of Gender. Kluwer Academic, New York, pp. 275–317.
Jacobs, J.A., 1989. Revolving Doors: Sex Segregation and Women's Careers. Stanford University Press, Stanford, CA.
Jacobs, J.A., 1995. Gender and academic specialties: Trends among recipients of college degrees in the 1980s. Sociology of Education 68, 81–98.
Jacobs, J.A., 1996. Gender inequality and higher education. Annual Review of Sociology 22, 153–185.
Jacobs, J.A., Steinberg, R.J., 1990. Compensating differentials and the male–female wage gap: Evidence from the New York state comparable worth study. Social Forces 69, 439–468.
Johnson, M.K., 2002. Social origins, adolescent experiences, and work value trajectories during the transition to adulthood. Social Forces 80, 1307–1340.
Kaufman, R.L., 2002. Assessing alternative perspectives on race and sex employment segregation. American Sociological Review 67, 547–572.
Kerckhoff, A.C., 1996. Building conceptual and empirical bridges between studies of educational and labor force careers. In: Kerckhoff, A.C. (Ed.), Generating Social Stratification: Toward a New Research Agenda. Westview Press, Boulder, CO, pp. 37–56.
Kilbourne, B.S., England, P., Beron, K., 1994a. Effects of changing individual, occupational, and industrial characteristics on changes in earnings: Intersections of race and gender. Social Forces, 72.
Kilbourne, B.S., England, P., Farkas, G., Beron, K., Weir, D., 1994b. Returns to skill, compensating differentials, and gender bias: Effects of occupational characteristics on the wages of white women and men. American Journal of Sociology 100, 689–719.
Konrad, A.M., Ritchie Jr., J.E., Leib, P., Corrigall, E., 2000. Sex differences and similarities in job attribute preferences: A meta-analysis. Psychological Bulletin 126, 593–641.
Lent, R.W., Brown, S.D., Gore Jr., P.A., 1994. Toward a unifying social cognitive theory of career and academic interests, choice, and performance. Journal of Vocational Behavior 45, 79–122.
Lippa, R., 1998. Gender-related individual differences and the structure of vocational interests: The importance of the people–things dimension. Journal of Personality and Social Psychology 74, 996–1009.
Long, J.S., 1997. Regression Models for Categorical and Limited Dependent Variables. Sage Publications, Thousand Oaks, CA.
Lueptow, L.B., 1980. Social change and sex-role change in adolescent orientation toward life, work and achievement: 1965–1975. Social Psychology Quarterly 43, 48–59.
Marini, M.M., Brinton, M.C., 1984. Sex-typing in occupational socialization. In: Reskin, B.F. (Ed.), Sex Segregation in the Workplace: Trends, Explanations, Remedies. National Academy Press, Washington, DC, pp. 191–232.
Marini, M.M., Fan, P.L., 1997. The gender gap in earnings at career entry. American Sociological Review 62, 588–604.
Marini, M.M., Fan, P.L., Finley, E., Beutel, A.M., 1996. Gender and job values. Sociology of Education 69, 49–65.
Marini, M.M., Greenberger, E., 1978. Sex differences in occupational aspirations and expectations. Sociology of Work and Occupations 5, 147–178.
McFadden, D., 1974. Conditional logit analysis of qualitative choice behavior. In: Zarembka, P. (Ed.), Frontiers in Econometrics. Academic Press, New York, pp. 105–142.
Okamoto, D., England, P., 1999. Is there a supply side to occupational sex segregation?. Sociological Perspectives 42, 557–582.
Oppenheimer, V.K., 1968. The sex-labeling of jobs. Industrial Relations 7, 219–234.
Parcel, T.L., Mueller, C.W., 1983. Ascription and Labor Markets: Race and Sex Differences in Earnings. Academic Press, New York.

Parcel, T.L., Mueller, C.W., 1989. Temporal change in occupational earnings attainment, 1970–1980. American Sociological Review 54, 622–634.
Peng, S.S., Jaffe, J., 1979. Women who enter male-dominated fields of study in higher education. American Educational Research Journal 16, 285–293.
Petersen, T., Morgan, L.A., 1995. Separate and unequal: Occupation-establishment sex segregation and the gender wage gap. American Journal of Sociology 101, 329–365.
Polachek, S.W., 1978. Sex differences in college major. Industrial and Labor Relations Review 31, 498–508.
Polachek, S.W., 1979. Occupational segregation among women: Theory, evidence, and a prognosis. In: Lloyd, C.B. (Ed.), Women in the Labor Market. Columbia University Press, New York, pp. 137–157.
Polachek, S.W., 1981. Occupational self-selection: A human capital approach to sex differences in occupational structure. Review of Economics and Statistics 63, 60–69.
Powers, D.A., Xie, Y., 2000. Statistical Methods for Categorical Data Analysis. Academic Press, New York.
Prediger, D.J., 1982. Dimensions underlying Holland's hexagon: Missing link between interests and occupations. Journal of Vocational Behavior 21, 259–287.
Reskin, B.F., 1993. Sex segregation in the workplace. Annual Review of Sociology 19, 241–270.
Reskin, B.F., 2003. Including mechanisms in our models of ascriptive inequality. American Sociological Review 68, 1–21.
Reskin, B.F., Padavic, I., 1994. In: Ragin, C., Griswold, W., Griffin, L. (Eds.), Women and Men at Work. Pine Forge Press, Thousand Oaks, CA.
Rogers, L., 2001. Sexing the Brain. Columbia University Press, New York.
Rosen, S., 1986. The theory of equalizing differences. Handbook of Labor Economics 1, 641–692.
Sandberg, D.E., Ehrhardt, A.A., Mellins, C.A., Ince, S.E., Meyer-Bahlburg, H.F.L., 1987. The influence of individual and family characteristics upon career aspirations of girls during childhood and adolescence. Sex Roles 16, 649–668.
Seymour, E., Hewitt, N.M., 1997. Talking About Leaving: Why Undergraduates Leave the Sciences. Westview Press, Boulder, CO.
Shu, X., Fan, P.L., Marini, M.M., 1996. Characterizing Occupations with Data From the Dictionary of Occupational Titles.
Sorensen, E., 1989. Measuring the pay disparity between typical female occupations and other jobs. Industrial Labor Relations Review 42, 624–639.
Spade, J.Z., Reese, C.A., 1991. We've come a long way, maybe: College students' plans for work and family. Sex Roles 24, 309–321.
Spain, D., Bianchi, S.M., 1996. Balancing Act: Motherhood, Marriage, and Employment among American Women. Russell Sage Foundation, New York.
Stata Corporation, 2003. Stata Base Reference Manual, Release 8. Stata Corporation, College Station, TX.
Tam, T., 1997. Sex segregation and occupational gender inequality in the United States: Devaluation or specialized training?. American Journal of Sociology 102, 1652–1692.
Tomaskovic-Devey, D., 1993. Gender and Racial Inequality at Work: Sources and Consequences of Job Segregation. ILR, Ithaca, NY.
Tomaskovic-Devey, D., Skaggs, S., 2002. Sex segregation, labor process organization, and gender earnings inequality. American Journal of Sociology 108, 102–128.
Tracey, T.J.G., Hopkins, N., 2001. Correspondence of interests and abilities with occupational choice. Journal of Counseling Psychology 48, 178–189.
Treiman, D.J., Hartmann, H., 1981. Women, Work, and Wages: Equal Pay for Jobs of Equal Value. National Academy Press, Washington, DC.
Turner, S.E., Bowen, W.G., 1999. Choice of major: The changing (unchanging) gender gap. Industrial and Labor Relations Review 52, 289–313.
Valian, V., 1999. Why So Slow? The Advancement of Women. The MIT Press, Cambridge, MA.
Ware, N.C., Lee, V.E., 1988. Sex differences in choice of college science majors. American Educational Research Journal 25, 593–614.

Warren, J.R., Sheridan, J.T., Hauser, R.M., 1998. Choosing a measure of occupational standing: How useful are composite measures in analyses of gender inequality in occupational attainment. Sociological Methods and Research 27, 3–76.

Williams, J., 2000. Unbending Gender: Why Family and Work Conflict and What to Do About It. Oxford University Press, Oxford.

Wilson, K.L., Boldizar, J.P., 1990. Gender segregation in higher education: Effects of aspirations, mathematics achievement, and income. Sociology of Education 63, 62–74.

Wolfe, L.K., Betz, N.E., 1981. Traditionality of choice and sex role identification as moderators of the congruence of occupational choice in college women. Journal of Vocational Behavior 18, 43–55.

Xie, Y., Goyette, K., 2003. Social mobility and the educational choices of Asian Americans. Social Science Research 32, 467–498.

Xie, Y., Shauman, K.A., 1997. Modeling the sex-typing of occupational choice. Sociological Methods and Research 26, 233–261.

Xie, Y., Shauman, K.A., 1998. Sex differences in research productivity: New evidence about an old puzzle. American Sociological Review 63, 847–870.

Xie, Y., Shauman, K.A., 2003. Women in Science: Career Processes and Outcomes. Harvard University Press, Cambridge, MA.

Zellner, H., 1975. The determinants of occupational segregation. In: Lloyd, C.B. (Ed.), Sex, Discrimination, and the Division of Labor. Columbia University Press, New York.