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Separate and Not Equal? Gender Segregation in the Labor Market and the Gender Wage Gap

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Occupational gender segregation is a strong feature of the US labor market. While some occupations have become increasingly integrated over time, others remain highly dominated by either men or women. Our analysis of trends in overall gender segregation shows that, after a considerable move towards more integrated occupations in the 1970s and 1980s, progress has completely stalled since the mid 1990s. Occupational segregation is a concern to policy makers for two reasons: it is inefficient economically, preventing able people from moving into occupations where they could perform well and that would satisfy them more than the ones open to them. And occupational segregation is a major cause for the persistent wage gap. Our analysis confirms that av-

erage earnings tend to be lower the higher the percentage of female workers in an occupation, and that this relationship is strongest for the most highly skilled occupations, such as medicine or law. Yet this is also a strong feature of jobs requiring little formal education and experience, increasing the likelihood of very low earnings for women working in female-dominated, low-skilled occupations such as childcare.

Introduction

In 2009, occupational gender segregation continued to be a strong feature of the US labor market. Among the 502 occupations identified by the Census Bureau, and covering the entire US civilian labor force, four of ten women (39.7 percent) worked in female-dominated occupations (those where incumbents are at least 75 percent female); these occupations employ fewer than one in twenty men (4.5 percent; IWPR 2010a).¹ Slightly more than four of ten men (43.6 percent) and only 5.5 percent of all women worked in male-dominated occupations (those where incumbents are at least 75 percent male). Our analysis for this Briefing Paper of trends in overall occupational gender segregation suggests that progress towards integration was made in the 1970s and 1980s, but that virtually no more progress can be observed since the mid 1990s (precisely 1996).

There are two reasons why such stark occupational segregation should be of concern to policy makers. Even though some of these patterns may be due to gendered preferences—a substantial body of social science research suggests that socialization in relation to gender norms continues to influence men's and women's average preferences and behavior (e.g., England 2005; Hulett, Bendick, Thomas and Moccio 2008)—much of these patterns reflects barriers to entry to occupations, ranging from lack

of information about alternative job options to active discouragement and harassment. Such barriers artificially restrict the movement of the most qualified and motivated people into occupations that would suit them best, exacerbate skill shortages, and reduce economic growth (Hill, Corbett, and Rose 2010).

A second reason for concern is the link between occupational segregation and gender inequality in earnings. In 2009, the median weekly earnings of full-time, female workers were 80.2 percent of what full-time male workers earned. Full-time, employed women on average earned less than their male counterparts in 104 of 108 occupations for which the Bureau of Labor Statistics (BLS) provides earnings data for both male and female workers (IWPR 2010a).² This suggests that the gender wage gap is an almost universal feature of the labor market, regardless of where women work. At the same time, female-dominated occupations have been shown to pay less than male-dominated occupations at the same skill levels (England, Allison, and Wu 2006). This implies that even if there is a gender wage gap within almost all occupations, women might be able to increase their absolute earnings by choosing to train for and work in occupations with higher shares of male workers. This link between occupational segregation and the gender wage gap makes occupational segregation relevant to the economic security of women and their families.

This Briefing Paper presents original data analyses of trends in occupational segregation over time and of the link between occupational segregation and the gender pay gap. First, trends in the gender composition of selected occupations are illustrated. Second, based on the Index of Dissimilarity, general trends in the occupational segregation of the labor market are analyzed. This analysis is conducted for the civilian labor force as a whole, for different educational levels, for different age groups, and for different race and ethnic groups. It is based on Current Population Survey data as provided by the Integrated Public Use Microdata Series and includes all workers aged 25 to 64. Third, the relationship between the percentage of female workers and the median earnings in occupations is explored. The analysis is based on 2009 earnings data for full-time workers aged 16 and older as provided by the BLS and on the BLS' classification of skill levels required for each occupation as adjusted by IWPR. Low-skilled, medium-skilled, and high-skilled occupations are distinguished.

Trends in Gender Segregation in Selected Occupations

During the last few decades the face of the American workforce has changed dramatically as more and more women entered the workforce and sought work in occupations in which women were previously only a tiny minority of workers. Figure 1 shows trends in women's share in selected occupations that were male- or female-dominated in 1972 and require less than a four-year college degree, while Figure 2 illustrates women's share in selected occupations requiring at least four years of college. Both show significant change in some occupations but not others. Women were only 6.7 percent of mail carriers in 1972, but their share had risen to 34.9 percent of this occupation by 2009 (Figure 1). Likewise, the share of women photographers has increased markedly, from about one in six (15.6 percent) in 1972 to close to half of all photographers (44.7 percent; Figure 1). The share of women dentists increased from only 1.9 percent in 1972 to 30.5 percent in 2009 (Figure 2) and for women lawyers from 4.0 percent of the profession in 1972 to 32.2 percent in 2009 (Figure 2). Change has also occurred in some occupations, such as 'cashiers,' which, in 1972, were classified as 'female-dominated' but no longer were so in 2009; 'cashiers' were 86.4 percent female in 1972, compared with 74.4 percent in 2009 (Figure 1).

Yet other occupations have seen very little change in their gender composition and remain highly dominated by either men or women. Of those occupations requiring less than a four-year college degree 97.6 percent of all dental assistants were female in 2009, compared with 97.9 percent in 1972, and 90.4 percent of all hairdressers, hairstylists and cosmetologists, compared with 91.2 percent in 1972 (Figure 1). Among those occupations requiring at least a four-year college degree, 96.8 percent of all prekindergarten and kindergarten teachers were female in 1972, compared with 97.8 percent in 2009; 82.7 percent of all librarians were female in 1972, compared with 81.6 percent in 2009; and 97.6 percent of 'registered nurses' in 1972 compared with 92 percent in 2009 (Figure 2).

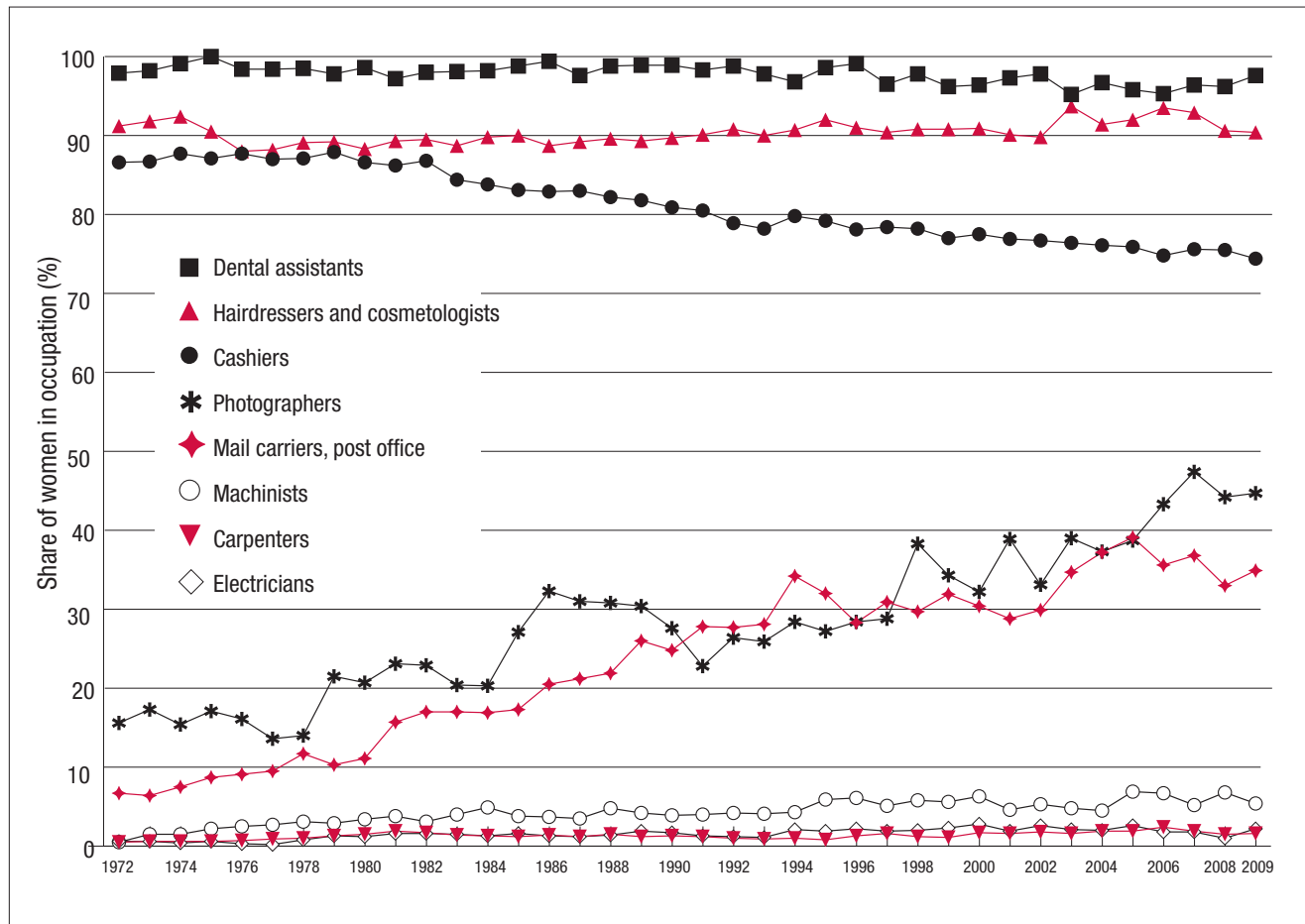
The link between occupational segregation and the gender wage gap makes occupational segregation relevant to the economic security of women and their families.

Women have gained in such occupations as mail carrier, photographer, physician, lawyer, and dentist.

Likewise, change has been at most marginal in some male-dominated occupations. In 1972 women were 0.5 percent of machinists, 0.6 percent of electricians and 0.5 percent of carpenters, and in 2009 only 5.4 percent of all machinists, 2.2 percent of all electricians, and 1.6 percent of all carpenters were female.

The data also show that change does not occur only towards greater gender integration. Taking ‘computer programmers’ as an example, it is not only that proportionately in 2009 there were only marginally more female ‘computer programmers’ than in 1972 (20.3 percent now compared to 19.9 percent then), but also that after an initial increase in women’s share of the occupation to more than one-third of programmers in the late 1980s, their share has fallen consistently since 1989. Civil engineering is another occupation that has seen a marked fall in women’s share of the profession after initial progress; the share of women among ‘civil engineers’ has almost halved in recent years, falling from its highest level of 13.2 percent in 2005 to only 7.1 percent in 2009 (Figure 2).

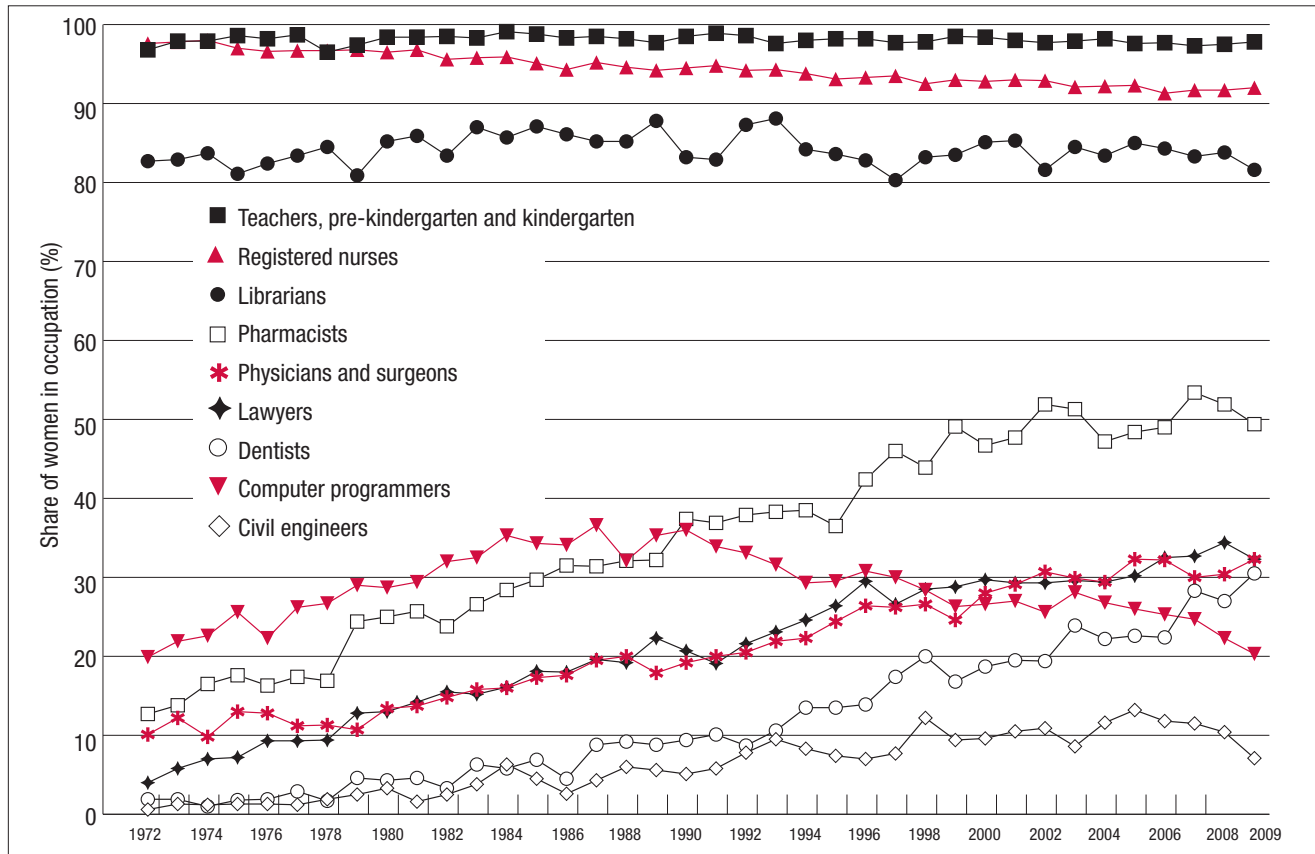
Figure 1: Share of Women in Selected Occupations Requiring Less than Four Years of College, 1972-2009



Notes: Data refer to annual averages and to all employed persons 16 years and older. From 2003 on, the category of ‘hairdressers and cosmetologists’ includes ‘hair stylists’ explicitly.

Source: IWPR compilation of data from the U.S. Department of Labor, Bureau of Labor Statistics, “B-20. Employed persons by detailed occupation, sex, and race, 1972-81;” “Employed persons by detailed occupation, sex, and race (1982);” “Employed persons by detailed occupation and sex, 1983-2002 annual averages;” “Employed persons by detailed occupation and sex, annual averages 2000-09.” Data are from the Current Population Survey.

Figure 2: Share of Women in Selected Occupations Requiring Four Years of College or more, 1972 to 2009



Notes: Data refer to all employed persons aged 16 and older. Between 1975 and 1982, 'physicians and surgeons' were described as 'physicians, medical and osteopathic' and between 1983 and 2002 as 'physicians.' The most common level of education for preschool teachers is a postsecondary vocational award, while it is a Bachelor's degree for kindergarten teachers. After 2003, 'teachers, prekindergarten and kindergarten' were accounted for as 'preschool and kindergarten teachers.'

Source: IWPR compilation based on same data sources as Figure 1.

Trends in Overall Occupational Gender Segregation

The data on changes in selected occupations suggest a differentiated picture, with some occupations becoming increasingly integrated over time, other occupations showing little movement towards a greater gender balance, and others showing increased segregation. The 'Index of Dissimilarity' provides an analytical tool for assessing which occupational trends are typical for the labor market as a whole. The Index measures how many women or men would have to change occupations to achieve the same gender composition in each occupation as in the civilian labor force overall. Each person is given equal weight, so that changes in larger occupations affect the index more than smaller ones; changes in the size of occupations also affect the level of the index even when no change in the gender composition of occupations occurs. The index ranges from 0 (complete integration) to 1 (maximal segregation; Duncan and Duncan 1955).³

Tracking change in the Index of Dissimilarity between 1972 and 2009, Figure 3 shows that during the first 25 years of that period there was significant reduction in occupational gender segregation of the civilian labor force. The Index for all workers fell from 0.68 in 1972 to 0.50 in 2002, when it was at its lowest point, a dip of 26 percent. Yet, in 2009 and most of the years since 1996, the index has hovered around 0.51. The trend towards integration appears to have stalled; there has been no further progress towards occupational gender balance.

After initial gains for women computer programmers, their share of the occupation has fallen consistently since 1989, and women's share of civil engineers peaked in 2005.

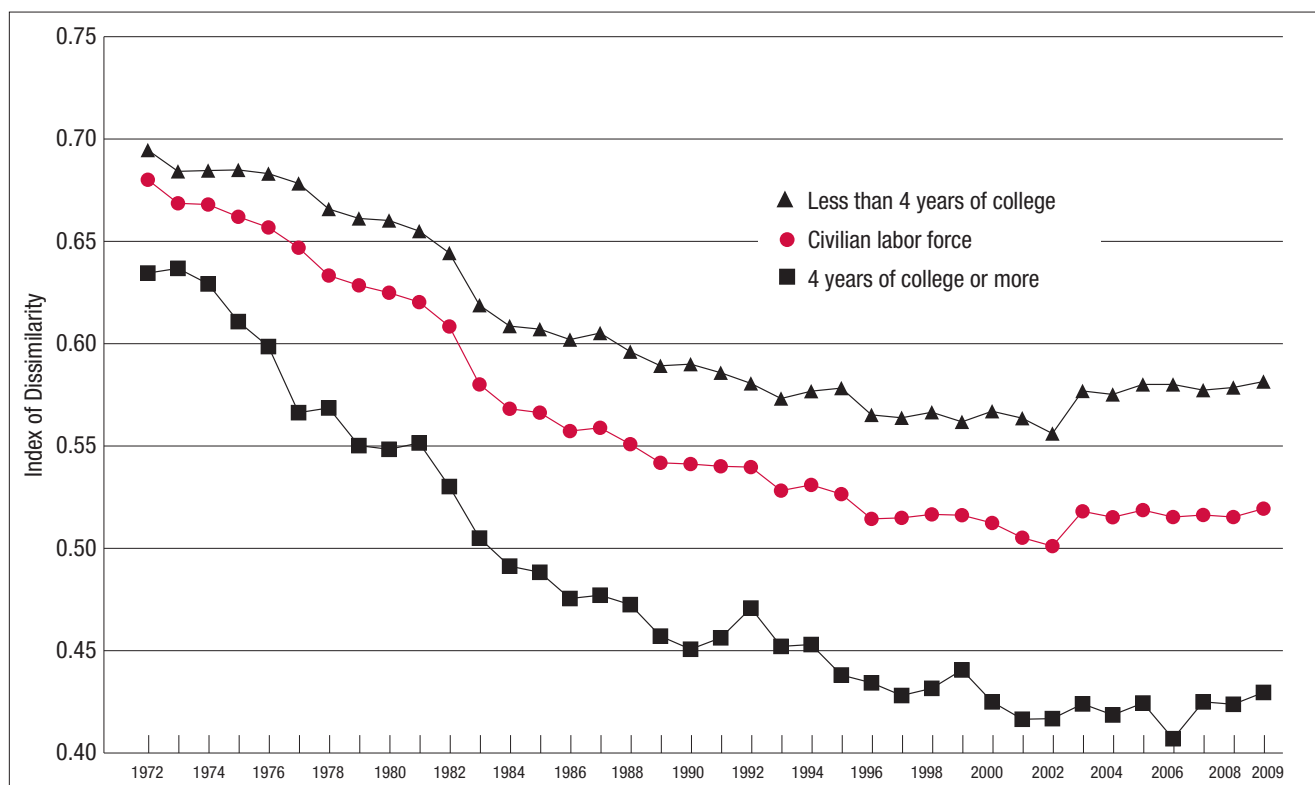
There are two different factors that contribute to change in the Index of Dissimilarity: a ‘composition’ effect and an occupational ‘mix’ effect. The ‘composition’ effect refers to the gender balance in individual occupations: the Index of Dissimilarity falls when more women work in previously male-dominated occupations, such as has been the case for lawyers, dentists and mail carriers; alternatively, the Index rises when women’s share of such occupations falls, such as recently in computer programming and civil engineering (Figures 1 and 2). The occupational ‘mix’ effect refers to the impact of different employment growth rates for different occupations: the Index falls if more gender-integrated occupations (such as legal or accounting occupations) grow faster than more gender-segregated occupations (such as many manufacturing occupations; data not shown); alternatively, when highly segregated occupations (such as nursing and other healthcare occupations; data not shown) grow faster than more integrated occupations, the Index will rise (showing greater segregation), even if the gender balance within individual occupations stays constant.

Following Blau and Hendricks (1979), we analyze the effect on the Index of each of these two factors separately, in each of the last four decades.⁴ Our analysis suggests that during the first two decades the fall in gender segregation was due to the composition effect, while the mix effect, although overall of lower magnitude, went in the opposite direction. This changed during the 1990s when both the composition and the mix effects led to a further reduction in occupational gender segregation, albeit to a smaller extent than in the previous decades. Finally, in the current decade, change in the composition of occupations has become almost insignificant, while the mix effect is resulting in a small overall increase in gender occupational segregation. In other words, during previous decades the main driver of change in occupational gender segregation was greater gender balance within individual occupations; during the current decade, the gender balance within occupations has hardly changed at all, while overall segregation has slightly increased because more segregated occupations have seen higher employment growth than more integrated ones.

Occupational Segregation Among Workers at Different Educational Levels

The Index of Dissimilarity is typically lower for workers with at least four years of college and higher for workers with lower levels of education; until the late 1990s segregation fell faster for highly educated workers than for other workers (Figure 3).⁵ Yet, just as for workers with lower levels of education, further progress towards gender integration has stalled for all workers, including the college-educated, in recent years.

Figure 3. Trends in Occupational Segregation by Gender: The Index of Dissimilarity, 1972-2009



Notes: Occupations are consistently classified according to the 1990 Census occupational classification. The analysis is restricted to the civilian labor force, and to workers aged 25 to 64, as it is reasonable to expect that persons in this age group have generally completed their schooling and have not yet retired.

Source: IWPR compilations are based on the Current Population Survey, March/Annual Social and Economic Supplement (ASEC), as provided by Miriam King, Steven Ruggles, Trent Alexander, Donna Leicack, and Matthew Sobek (2009).

Occupational Segregation Among Different Age Groups

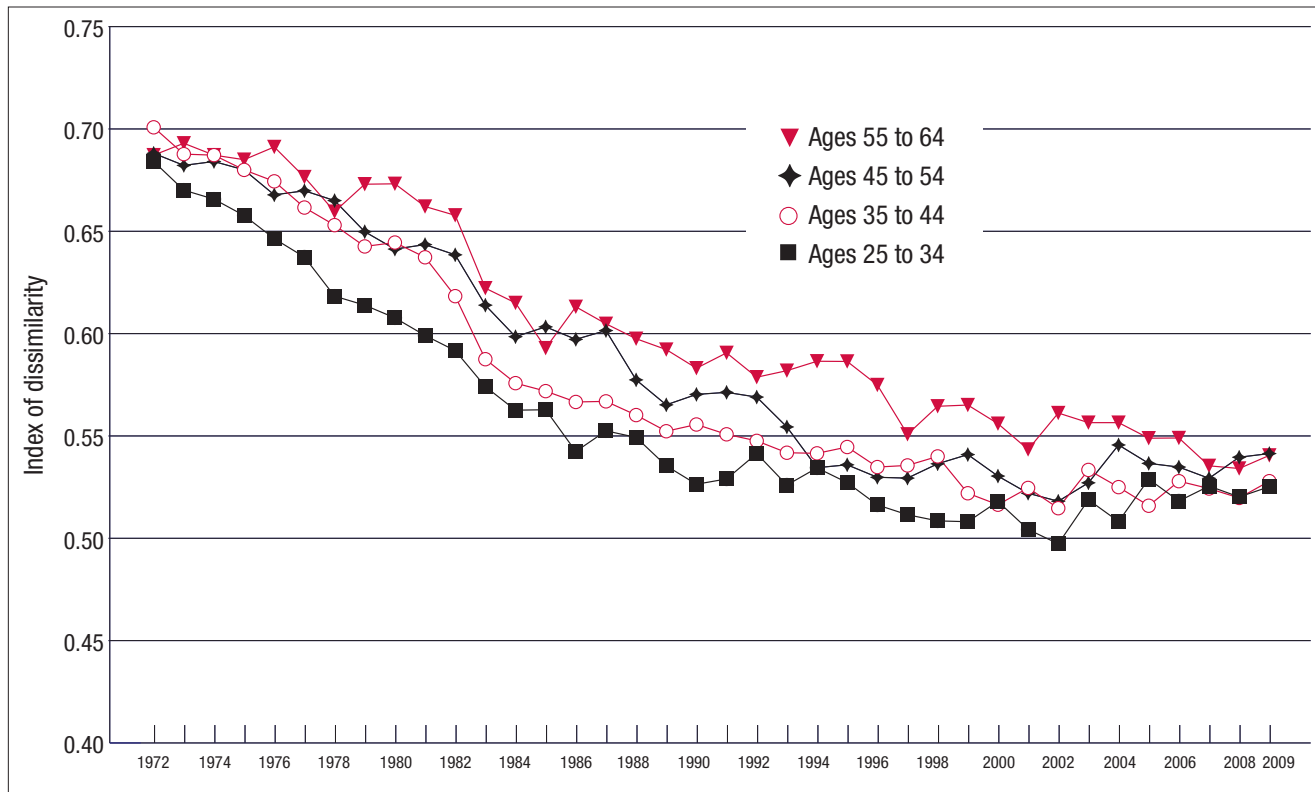
Perhaps even more disconcerting is the stalled progress towards integration for younger women. It seems reasonable to expect that occupational segregation diminishes for each generation of young men and women entering the labor market. To examine the change for different age groups, we look separately at trends for four different age groups: ages 25 to 34, ages 35 to 44, ages 45 to 54, and ages 55 to 64 (Figure 4). In the early 1970s, there was little difference in the level of occupational segregation between different age groups. Over the next 25 years, even though all age groups experienced falling levels of occupational segregation, the change was strongest for the youngest age group, as both younger men and women were more likely to work in more integrated oc-

Younger women are not much more likely to work in integrated occupations than older women.

cupations than older workers. This change was accompanied by changes in educational achievement, with younger women moving into occupations requiring higher levels of education. Yet, this trend of increasing integration stalled in the late 1990s and indeed, since 2002, has reversed for the youngest age group. In 2009, levels of gender segregations in the youngest age group have converged with those for workers aged 35 to 44, and differences between these and the older two groups are once again small.

Between 1972 and 1996, there was significant reduction in occupational gender segregation, but there has been no further progress towards gender balance in occupations since 1996.

Figure 4. Occupational Gender Segregation and Age: Index of Dissimilarity, 1972 – 2009, by Age Groups (in a Given Year)



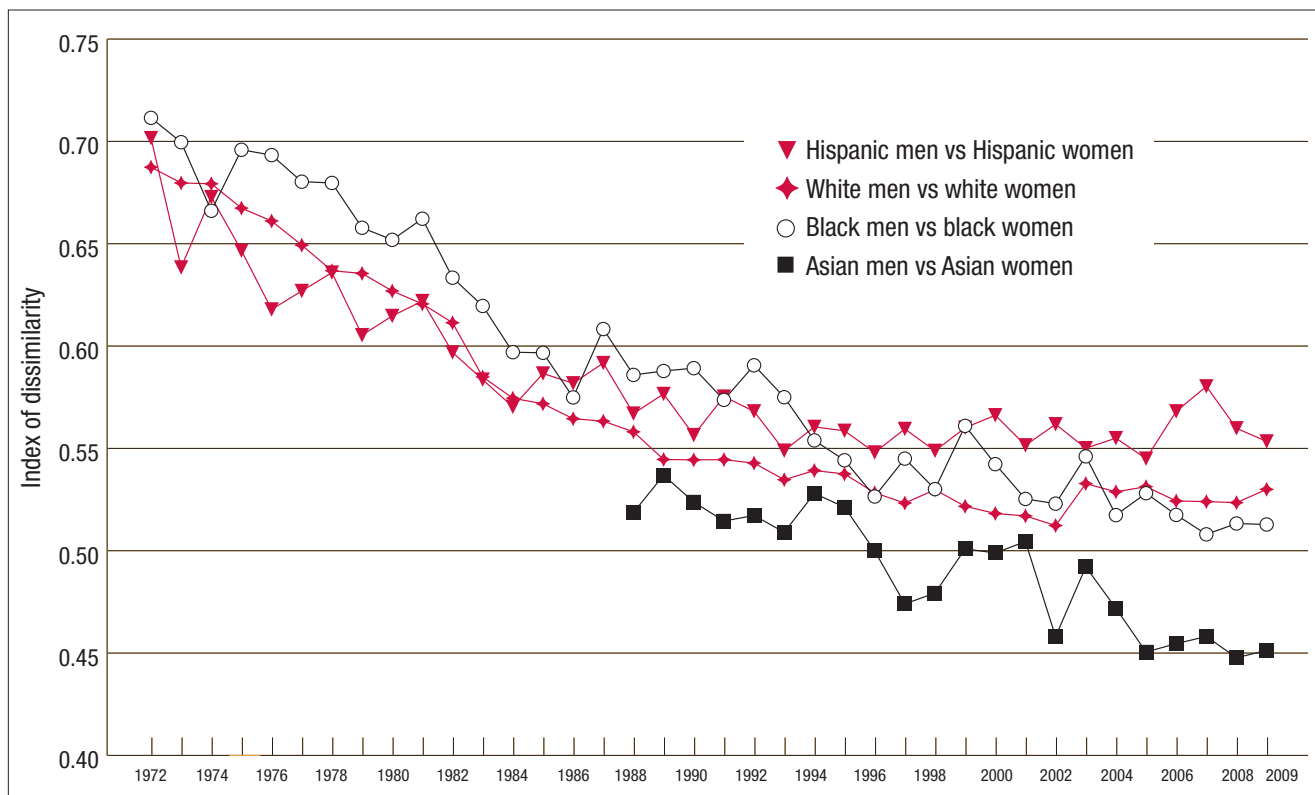
Notes: Occupations are consistently classified according to the 1990 Census occupational classification. The analysis is restricted to the civilian labor force and to workers aged 25 to 64.

Source: IWPR compilation; same data source as Figure 3.

Occupational Segregation by Race and Ethnic Background

We also examine trends in gender segregation for each major race and ethnic group. First, we look at change in occupational gender segregation across time within each major race and ethnic group (Figure 5). Across time, the likelihood of men and women of the same racial/ethnic group working in the same occupation has increased for all groups; that is, the Index of gender segregation has fallen for each racial/ethnic group. There are marked differences between groups in the level of segregation. In 2009, occupational gender segregation was highest among Hispanics (with an Index of Dissimilarity value of 0.55). Occupational gender segregation was lowest among Asian Americans and Pacific Islanders (with an Index value of 0.45), likely a reflection of the comparatively high levels of occupational attainment for both men and women in this group. Segregation continues to be higher among whites and among African Americans (with Index values of 0.53 and 0.51, respectively) than it is among Asian Americans and Pacific Islanders.

Figure 5. Occupational Gender Segregation among Race and Ethnic Groups: Index of Dissimilarity, 1972 – 2009, Comparisons Between Men and Women Within Race/Ethnicity Groups



Notes: Occupations are consistently classified according to the 1990 Census occupational classification. The analysis is restricted to the civilian labor force, and to workers aged 25 to 64. Whites, blacks and Asian groups are non-Hispanic. "Asians" include "Asian only" as well as "Hawaiian/Pacific Islander" (data available only from 1988 onward).

Source: IWPR compilation; same data source as Figures 3

Occupational segregation is also present among women (and men) of different race and ethnic groups; that is, for example, white women and Hispanic women have different occupational profiles (Table 1). In 2009, the Index of Dissimilarity was 0.28 for white versus black women, 0.31 for white versus Asian women, and 0.31 for white versus Hispanic women. Among men, the Index of Dissimilarity for different race and ethnic groups is slightly higher than for women (Table 1). Yet for both women and men, segregation by race or ethnic background is considerably less pronounced than gender segregation.

Table 1: Race and Ethnic Occupational Segregation among Men and Women: Index of Dissimilarity, 2009

	White vs Black	White vs Asian	White vs Hispanic
Women	0.28	0.31	0.31
Men	0.33	0.33	0.37

Notes: Occupations are consistently classified according to the 1990 Census occupational classification.

The analysis is restricted to the civilian labor force and to workers aged 25 to 64. Whites, blacks and Asian groups are non-Hispanic. “Asians” include “Asian only” and “Hawaiian/Pacific Islander.”

Source: IWPR compilation; same data source as Figures 3.

The Link between Occupational Segregation and the Gender Wage Gap

Previous research suggests that a significant share of the gender wage gap is accounted for by differences in the occupations where men and women work (Blau and Kahn 2006, 2007).⁶ To examine the link between occupational segregation and differences in median earnings, we analyze the relationship between the percentage of female workers and earnings in occupations separately for three broad groupings: ‘low-skilled’, ‘medium-skilled’ and ‘high-skilled’ occupations. These groupings are based on the BLS’ 11-group classification of occupations according to educational and training requirements (U.S. Department of Labor, Bureau of Labor Statistics 2010). ‘Low-skilled’ occupations are occupations which, according to the BLS, require short-term, on-the-job training of no more than one month; ‘medium-skilled’ occupations are defined as those requiring more than one month of on-the-job training, but less than a Bachelor’s degree, and include occupations that require postsecondary vocational awards or associate degrees; and ‘high-skilled’ occupations are those requiring at least a Bachelor’s degree. Because the BLS classification is designed to provide advice on career entry, not to provide a description of prevailing skill or educational levels, we add an additional criterion for allocating an occupation to a specific skill level: an occupation is reclassified from low-skilled to medium-skilled if more than 50 percent of the workforce has at least some college. Occupations that are reclassified in this manner for example include teacher assistants, file clerks, and postal service mail carriers. Other occupations, such as childcare workers, remain in the low-skill group because fewer than 50 percent of childcare workers have a qualification beyond a high school diploma.⁷ In the medium-skilled category, an occupation is reclassified as high-skilled where more than 50 percent of the workforce of an occupation has at least a Bachelor’s degree; registered nurses are an example of an occupation reclassified from medium- to high-skilled (see Appendix for methodological details).

Next for each of these broad skill groupings, we classified occupations separately by their gender balance, differentiating between male-dominated occupations (where at least 75 percent of workers are male), female-dominated occupations (where at least 75 percent of workers are female) and a remaining mixed group with a more balanced gender distribution, resulting in nine subgroups altogether (see Table 2 for the three largest occupations in each of these subgroups). All data discussed in this section refer to full-time workers aged 16 and older.

Before examining differences in median earnings, we first look at the distribution of the workforce among these broad groupings. Low-skill occupations employ more than 16 million full-time workers, 17.6 percent of all male workers and 14.7 percent of all female workers (Table 3). Compared with the other skill groups, a particularly high proportion of low-skilled workers (38.9 percent of all workers in this group) works in male-dominated occupations (such as ‘driver/sales workers and truck drivers’ and ‘laborers and freight, stock and material moving, hand’). Female-dominated, low-skilled occupations, including for example ‘nursing, psychiatric, and home health aides’ and ‘maids and housekeeping cleaners,’ employ half as many workers as low-skilled, male-dominated occupations, and account for 19.7 percent of all workers in the low-skilled group. The remaining group of low-skilled occupations, those with a more balanced gender mix (including, for example, ‘janitors and building cleaners’ and ‘cashiers’) accounts for 41.4 percent of all workers in the low-skilled group, and for close to half of low-skilled female workers (49.5 percent; Table 3).

Occupational segregation by race or ethnic background is considerably less pronounced than occupational segregation by gender.

Table 2: The Three Largest Occupations for Each Broad Skill Level and Type of Gender Composition, 2009

	Male-dominated occupations (25 percent or less female)	Mixed occupations (25.1 to 74.9 percent female)	Female-dominated occupations (75 percent or more female)
Low-skilled	Driver/sales workers and truck drivers	Janitors and building cleaners	Nursing, psychiatric, and home health aides
	Grounds maintenance workers	Stock clerks and other fillers	Personal and home care aides
Medium-skilled	Construction laborers	First-line supervisors/managers of retail	Secretaries and administrative assistants
	Security guards and gaming surveillance officers	Managers, all other	Bookkeeping, accounting, and auditing clerks
High-skilled	Chief executives	Accountants and auditors	Elementary and middle school teachers
	Computer software engineers	Secondary school teachers	Registered nurses
	Construction managers	Financial managers	Social workers

Note: Data refer to full-time workers aged 16 and older.

Source: IWPR compilation based on U.S. Department of Labor, Bureau of Labor Statistics, 2009. "Household Data Annual Averages, Table 39."

Table 3: Distribution of Full-Time Workers Across Occupations, According to Skill Level and Gender Composition, 2009

		Male-dominated occupations (25 percent or less female) (in '000)	Mixed occupations (25.1 to 74.9 percent female) (in '000)	Female-dominated occupations more female) (in '000)	Sum
Low-skilled	All workers	6,341 (38.9%)	6,740 (41.4%)	3,202 (19.7%)	16,283 (100%)
	Percent of all workers	6.4%	6.8%	3.2%	16.3%
	Men	5,821 (60.1%)	3,481 (35.9%)	391 (4.0%)	9,693 (100%)
	Percent of all men	10.6%	6.3%	0.7%	17.6%
	Women	518 (7.9%)	3,256 (49.5%)	2,810 (42.7%)	6,584 (100%)
	Percent of all women	1.2%	7.3%	6.3%	14.7%
Medium-skilled	All workers	17,940 (33.7%)	23,730 (44.6%)	11,547 (21.7%)	53,217 (100%)
	Percent of all workers	18.0%	23.8%	11.6%	53.4%
	Men	16,411 (54.1%)	12,655 (41.8%)	1,244 (4.1%)	30,310 (100%)
	Percent of all men	29.9%	23.0%	2.3%	55.1%
	Women	1,526 (6.7%)	11,079 (48.4%)	10,303 (45.0%)	22,908 (100%)
	Percent of all women	3.4%	24.8%	23.0%	51.2%
High-skilled	All workers	6,186 (20.5%)	17,899 (59.3%)	6,098 (20.2%)	30,183 (100%)
	Percent of all workers	6.2%	18.0%	6.1%	30.3%
	Men	5,153 (34.4%)	8,876 (59.3%)	933 (6.2%)	14,962 (100%)
	Percent of all men	9.4%	16.1%	1.7%	27.2%
	Women	1,030 (6.8%)	9,025 (59.3%)	5,163 (33.9%)	15,218 (100%)
	Percent of all women	2.3%	20.2%	11.5%	34.0%

Notes: Data refer to full-time workers aged 16 and older. Data are made available by the BLS only where there are an estimated minimum of 50,000 workers in an occupation, and are rounded to the closest integer. 'Motion picture projectionists,' 'nuclear technicians,' 'fishers and related fishing workers,' 'automotive body and related repairers,' and 'model makers and patternmakers, wood' could not be included because the data do not allow to identify the percentage of female workers in these occupations. Together these occupations account for 143,000 workers, and all of them are classified as requiring medium skills. All other 498 occupations are included. Skill levels are defined and assigned to occupations according to U.S. Department of Labor, Bureau of Labor Statistics, 2008, "Table 1.11. Education and training measurements by detailed occupation, 2008" as adjusted by IWPR (see the Appendix for methodological details).

Source: IWPR compilation based on U.S. Department of Labor, Bureau of Labor Statistics, 2009, "Household Data Annual Averages, Table 39."

Medium-skilled occupations account for more than 53 million full-time workers, 55.1 percent of all men and 51.2 percent of all women (Table 3). As it is the case at the low-skill level, more workers in this group work in occupations that are dominated by one gender than in the more balanced mixed occupations, but, unlike in the low-skilled group, the difference between the shares of women and of men in the mixed group is not large. Male-dominated occupations (including, for example, occupations such as ‘electricians’ and ‘carpenters,’ ‘construction laborers,’ and ‘security guards and gaming surveillance officers;’ see Table 2) employ a third of all workers in medium-skilled occupations (33.7 percent). Female-dominated, medium-skilled occupations (for example, ‘secretaries and administrative assistants’ and ‘bookkeeping, accounting and auditing clerks’) employ slightly more than a fifth of all workers in this group (21.7 percent). The mixed occupations that are not dominated by either men or women, account for the remaining 44.6 percent of workers employed at the medium-skill level. These occupations include ‘first-line supervisors/managers of retail sales workers’ and ‘managers, all other’ (Table 2).

For each broad skill level, median earnings are highest in male-dominated occupations.

Finally, more than 30 million full-time workers are employed in high-skilled occupations. At 34.0 percent, a higher share of all women than men (27.2 percent) works in high-skilled occupations (Table 3). This skill level has the largest share of workers in mixed occupations, and the smallest share of workers in male-dominated occupations. Male-dominated occupations (such as ‘chief executives’ for example, and ‘computer software engineers’) account for only a fifth of high skilled workers (20.5 percent). Mixed occupations (such as ‘accountants and auditors’ and ‘secondary school teachers’) account for almost six of ten workers (59.3 percent). One in five high-skilled workers (20.2 percent) work in female-dominated occupations such as ‘elementary and middle school teachers’ and ‘registered nurses’ (Table 3).

Median Earnings are Highest in Male-Dominated Occupations at Each Broad Skill Level

Next we calculate the median weekly earnings at each skill level separately for male-dominated, mixed and female-dominated occupations (Table 4). At each skill level, median earnings are highest in male-dominated occupations and lowest in female-dominated occupations.

Table 4: Median Weekly Earnings in Occupations by Skill Level and Gender Composition, 2009

	Male-dominated occupations (25 percent or less female)	Mixed occupations (25.1 to 74.9 percent female)	Female-dominated occupations (75 percent or more female)	Earnings in female-dominated occupations as percent of earnings in male-dominated occupations
Low- skilled occupations	\$553	\$435	\$408	73.8%
Medium- skilled occupations	\$752	\$735	\$600	79.8%
High- skilled occupations	\$1,424	\$1,160	\$953	66.9%

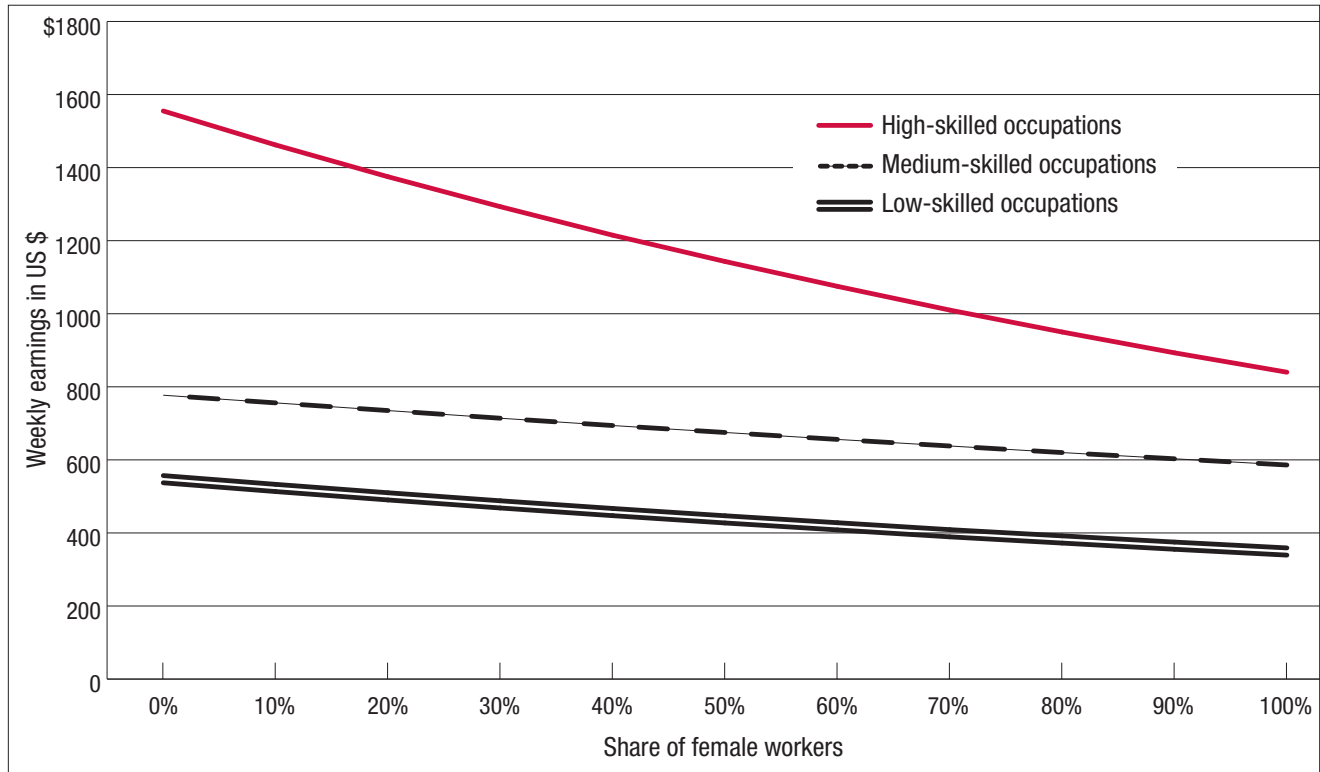
Notes: Data refer to full-time workers aged 16 and older. Earnings data represent weighted averages of median weekly earnings in occupations; data are made available by the BLS only for occupations with an estimated minimum of 50,000 workers.

Source: IWPR compilation, data sources are the same as in Table 2.

This negative relationship between the percentage of female workers and the level of earnings at each skill level is also confirmed when we perform a more precise statistical analysis (for full results of the analysis and a methodological explanation see the Appendix). Figure 6 presents the results of the statistical analysis and illustrates for occupations that at each of the three skill levels, a higher percentage of female workers in an occupation is associated with lower earnings. This negative relationship is clearly most pronounced among high-skilled occupations. Among low- and medium-skilled occupations, this relationship is less pronounced, but nonetheless negative.

The statistical relationship between earnings and gender composition identified by our model suggests that a high-skilled occupation that is 0 percent female would pay \$1,555 per week while one that is 100 percent female would pay only \$840 per week, or 46 percent less.

Figure 6: The Relationship between the Share of Female Workers and Earnings for Occupations at Different Skill Levels, 2009



Notes: Data refer to full-time workers aged 16 and older. Data are made available by the BLS only where there are an estimated minimum of 50,000 workers in an occupation. Occupations have been weighted by total occupation size, i.e., bigger occupations count more than smaller ones. See Appendix Table 1 for details of the regression analysis.

Source: Illustration of IWPR regression analysis based on the same data sources as Tables 2 and 3.

The fact that differences in earnings between male- and female-dominated occupations are most marked for workers in the highest skilled occupations is not least due to the growing general inequality in the U.S. labor market during the past several decades. In real terms, average male earnings are now approximately at the same level as they were thirty years ago (IWPR 2010b: Table 2). This general stagnation in real earnings reflects an increasing polarization in the labor market, with some highly skilled employees having seen substantial increases, and others, particularly in lower skilled typically male jobs, having seen actual reductions in their real wages. This is at least partly a result of the decline in the power of unions (Levy and Temin 2007). Yet, even though on average women's real earnings grew over this same period, because women started from a much lower base, in absolute terms their earnings remain below those of men, including in the lowest paid jobs.

Because of the negative relationship between the share of women and earnings, even though low-skilled occupations typically pay low wages in general, wage levels are particularly low for workers in the occupations predominantly done by women. Across occupations, the median earnings of all full-time workers in female-dominated, low-skilled occupations are only \$408 per week, 73.8 percent of the median weekly earnings paid in male-dominated, low-skilled occupations (\$553). Take childcare workers, for example. In 2009, the median earnings of childcare workers were \$367 per week (female full-time childcare workers earn \$364 per week and for male childcare workers no separate earnings data are available because there are so few of them).⁸ For a single parent with two children who is lucky enough to have full-time work every week of the year, this would be just enough to push earnings above the official poverty line for a family of three (\$18,310).⁹

Because of the negative relationship between the share of women and earnings in an occupation, wage levels are particularly low for workers in low-skilled occupations predominantly done by women.

Some male-dominated occupations are also very low paid. Indeed, the occupation with the lowest median earnings for full-time work is ‘dish washers,’ at only \$334 (male dish washers have median weekly earnings of \$339, but there are too few female dish washers to calculate median female earnings). But, the earnings spectrum for male-dominated, low-skilled occupations is broader than for female-dominated occupations, reaching \$685 as the median weekly earnings of full-time ‘driver/sales workers and truck drivers.’ The ‘highest’ paid female-dominated, low-skilled occupation, with median earnings of \$438, is ‘nursing, psychiatric and home health aides.’

The same general negative relationship between the share of women in an occupation and median earnings of all full-time workers is found for those occupations classified as medium-skilled. As discussed previously, this group includes the majority of workers and encompasses occupations requiring high school completion, some college or a vocational certificate, or an associate degree. This group also includes many (predominantly male) occupations that do not necessarily require formal qualifications but do require long-term, on-the-job training. At the medium-skill level, male-dominated occupations have median weekly earnings of \$752, compared with \$600 paid by female-dominated, medium-skilled occupations (Table 4). The median earnings in female-dominated, medium-skilled occupations are 79.8 percent of the median earnings in male-dominated occupations, a considerable earnings gap but smaller than for the other two skill levels (66.9 and 73.8 percent for high- and low-skilled occupations, respectively; Table 4).

The medium-skilled group includes a broad spectrum of workers, including substantial numbers of supervisory and other low-level managers. Among female-dominated, medium-skilled occupations, ‘dental hygienists’ have the highest median weekly earnings of \$956. Among male-dominated, medium-skilled occupations, the highest median weekly earnings are those of ‘first-line supervisors/managers of fire fighting and prevention workers’ at \$1,345. Earnings in many of the male-dominated occupations in this medium-skill grouping, however, are not so high: ‘carpenters’ have median weekly earnings for all workers at \$662 (\$665 for male full-time workers; for women no separate data are available) and ‘electricians’ have median weekly earnings for all workers at \$856 (\$858 for male full-time workers; for women no separate data are available). Both electricians and carpenters typically require long-term, on-the-job training through apprenticeships and post-apprenticeship training. A second example

of a female-dominated occupation with relatively high median weekly earnings is ‘paralegals and legal assistants’ (\$846 for all workers). Female-dominated occupations with decent earnings almost invariably require at least some college education, whereas equivalent male occupations are much less likely to have similar requirements. The hostile environment in many of the male-dominated trades severely limits access to decent earnings for those women who are less inclined or able to pursue college education (Bergmann Forthcoming).

Finally, for high-skilled occupations, i.e., those requiring at least a four-year college degree, earnings overall are significantly higher compared with earnings at the two lower skill levels. At the same time, the gap between median weekly earnings paid in male-dominated occupations and median weekly earnings paid in female-dominated occupations is largest at the high-skill level. Across all female-dominated occupations, median weekly earnings of all full-time workers are \$953, only 66.9 percent of the median weekly earnings of all full-time workers employed in male-dominated occupations (\$1,424; Table 4).

At the high-skilled level, the median weekly earnings spectrum of all full-time workers in the female-dominated occupations ranges from \$759 earned by ‘dietitians and nutritionists,’ to \$1,153, earned by full-time ‘speech language pathologists.’ Workers in the highest-earning, male-dominated occupation, ‘chief executives,’ have median weekly earnings of \$1,916. Median earnings are also clearly higher in high-skilled, mixed occupations than in high-skilled, female-dominated occupations (with some important exceptions such as nursing, for example). Illustrating this with just one example, ‘pharmacists’ have the highest median weekly earnings, at \$1,841, of all the high-skilled, mixed occupations; these are significantly higher than median weekly earnings of speech language pathologists, the highest paid occupation among the female-dominated, high-skilled occupations.

The gap in median weekly earnings between male-dominated and female-dominated occupations is largest at the high-skill level.

Occupational gender segregation for young women, aged 25 to 34, is now stronger than it was at the beginning of this millennium.

Summary and Policy Implications

This Briefing Paper provides evidence on two related features of the American labor market: gender segregation in occupations and the gender wage gap. Our analysis of occupational data shows that, after a steady trend towards a more even distribution of men and women across occupations during the 1970s and 1980s, there has been no further progress since the late 1990s, amounting to more than a decade of stalled progress. This is true both for occupations requiring at least a four-year college degree and for occupations requiring lower levels of educational attainment (even though the former tend to have a more even gender mix than the latter). Indeed, occupational gender segregation for young women, aged 25 – 34 years, is now stronger than it was at the beginning of this millennium. Our analysis shows that race and ethnic background are significant factors in explaining occupational patterns when considering women and men separately. That is, women of different race and ethnic backgrounds have different occupational patterns (as do men). Yet the data clearly confirm that gender is the predominant factor in occupational segregation in all major race and ethnic groups.

Occupational segregation matters because there is considerable research suggesting that occupational choice is often constrained, by socialization, lack of information, or more direct barriers to entry to training or work in occupations where one sex is a small minority of the workforce. This leads not only to sub-optimal outcomes for individual workers, but also reduces overall productivity and economic growth as employers have to select workers from a smaller and less motivated pool of workers.

Occupational segregation also matters because our analysis shows that there is a systematic link between the share of women working in an occupation and median weekly earnings: the higher the share of women, the lower the median earnings at each of three broad skill levels. This gender wage gap between occupations comes on top of the gender wage gap within occupations (IWPR 2010a), providing women who work in female-dominated occupations a double disadvantage: lower earnings because they are working in an occupation that is mostly done by women, and lower earnings because within each occupation women are likely to earn less than men. In absolute dollar terms the highest educated workers lose out most if they work in an occupation predominantly done by women, rather than in a more mixed or male-dominated college-degree level occupation. Yet, the implications are perhaps starkest for workers in the least skilled jobs. Here, working in a female- rather than a male-dominated occupation may make the difference between wages close to poverty and wages that can support a family at a decent level. For the many families who rely on a single female bread winner, the potential consequences are particularly harsh.

Our analysis further confirms the different role of educational attainment and vocational qualifications for male- and female-dominated jobs. While, even in the medium-skill category, there are several male-dominated occupations where the majority of workers have no more than a high school diploma, this is rare in female-dominated occupations. In female-dominated occupations and those with a more even gender balance, educational achievement is key for advancement along the earnings scale; in male-dominated jobs, on-the-job training continues to play a much greater role. The labor market for workers without formal qualifications has become much more hostile in recent decades for both men and women. Yet, while the male-dominated trades continue to offer some path to decent earnings for men without formal post-secondary education, the lack of access to such jobs for similarly educated women bars them from those opportunities.

***Last but not least,
there needs to be better
enforcement of both
equal pay and equal
opportunity laws.***

A number of policy approaches are required to address occupational gender segregation and the wage gap. Girls and women need better advice when they embark on a career to allow them to make informed choices, not least in relation to the relative earning potential of different occupations. More targeted training and employment programs are needed to reduce the barriers for women interested in entering non-traditional trades. Both training providers and employers need to be held accountable for the efforts they make in recruiting and retaining women, particularly where they are in receipt of federal funds. Low-income mothers in particular need to be encouraged to pursue training and education, and given supports that will allow them to succeed. Last but not least, there needs to be better enforcement of both equal pay and equal employment opportunity laws to ensure that women are not short changed in pay for the work that they do and that they are not discriminated against in hiring (and promotion) when they appear with all the same skills and abilities as their male counterparts.

***In the least-skilled jobs,
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APPENDIX

Methodological Note on the Classification of Skill Levels

To identify for each occupation whether it should be classified as requiring low, medium, or high skills, we use the category system of the BLS that assigns the “most significant source of education or training” to detailed occupations (U.S. Department of Labor, Bureau of Labor Statistics. 2008, 2010). The Bureau of Labor Statistics considers eleven different categories that we combined into three broader ones. ‘Short-term on-the-job training’ we defined as ‘low-skilled’ requirements. ‘Moderate-term on-the-job training,’ ‘long-term on-the-job training,’ ‘work experience in a related occupation,’ ‘postsecondary vocational awards,’ and ‘associate degrees’ we defined as ‘medium-skilled’ requirements. Finally, ‘Bachelor’s degree,’ ‘Bachelor’s or higher degrees plus work experience,’ ‘Master’s degrees,’ ‘Doctoral degrees,’ and ‘first professional degrees’ we defined as ‘high-skilled’ requirements.

We adjust the skill requirements data in three systematic ways. First, if 50 percent or more of the workers of an occupation have some college, that occupation is moved from the ‘low-skilled’ to the ‘medium-skilled’ category. We do not, however, reclassify any occupation from ‘medium-’ to ‘low- skilled’ for lack of education if the BLS identifies that occupation as requiring more than short-term on-the-job training. Second, if more than 50 percent in an occupation hold a Bachelor’s degree or a degree higher than that, we move that occupation up from ‘medium-skilled’ to ‘high-skilled.’ In 2009, of workers in the civilian labor force aged 25 years and older, 9.1 percent had not completed high school (10.9 percent of men, 7.2 percent of women); 28.8 percent had only a high school diploma (30.2 percent of men, 27.1 percent of women); 27.7 percent had some college, including associate degrees (25.7 percent of men, 30.1 percent of women); and 34.4 percent had a Bachelor’s degree or higher (33.3 percent of men and 35.6 percent of women; U.S. Department of Labor, Bureau of Labor Statistics 2010c). Third and last, the BLS earnings data we use refer to 503 occupations in total. This is a slightly less detailed classification system than the education and training category system of the BLS. When several categories must be combined to match one occupation in the earnings data, we use the skill requirement that the majority of the smaller categories has.

Methodological Note and Results for the Statistical Analysis of the Relationship between Skill Levels, Earnings, and the Gender Composition Occupations

We use regression analysis to assess how the percentage of female workers in occupations is correlated with the level of earnings at different skill levels. ‘Low-skilled’ is the omitted skill level. ‘Medium-skilled’ and ‘High-skilled’ are dummy variables for medium- and high-skilled levels, respectively, and ‘Medium-skilled * Percent female’ and ‘High-skilled * Percent female’ are interaction terms with the percentage of female workers at the medium- and the high-skilled levels, respectively. The explained variable is the logarithm of median weekly earnings of full-time workers of both sexes. Occupations have been weighted by the number of workers (both sexes) employed in them (Table 4).

Appendix Table 1: The Relationship between the Share of Female Workers and Earnings for Occupations Grouped by Skill Level (Regression Analysis)

	Coefficient	Standard Error
Percent female	-0.4390***	0.005256
Medium-skilled	0.3337***	0.003164
Medium-skilled * Percent female	0.1564***	0.006063
High-skilled	1.0271***	0.003925
High-skilled * Percent female	-0.1768***	0.007278
Constant	6.3221***	0.002711
p-value/F-test		<.0001
R-squared/adj. R-squared		0.7101/0.7101

*** Significant at the 1% level.

Notes: Data refer to full-time workers aged 16 and older. Data are made available only where there are an estimated minimum of 50,000 workers in an occupation. The total numbers of workers in each occupation are used as frequency weights. The model is specified as: $\ln(\text{median weekly earnings, all workers}) = \text{Constant} + b_1 * \text{Percent female} + b_2 * \text{Medium-skilled} + b_3 * \text{Medium-skilled} * \text{Percent female} + b_4 * \text{High-skilled} * \text{Percent female} + \varepsilon$

Source: IWPR analysis, same data source as Tables 2 and 3 and Figure 6.

References

- Babcock, Linda and Sara Lachever. 2003. *Women Don't Ask: Negotiation and the Gender Divide*. Princeton and Oxford: Princeton University Press.
- Bergmann, Barbara. Forthcoming. "Comment on Paula England, "The Gender Revolution: Uneven and Stalled" *Gender and Society*.
- Blau, Francine D. and Wallace E. Hendricks. 1979. "Occupational Segregation by Sex: Trends and Prospects." *The Journal of Human Resources* 14 (2): 197-210
- Blau, Francine D. and Lawrence M. Kahn. 2006. "The U.S. Gender Wage Gap in the 1990s: Slowing Convergence." *Industrial and Labor Relations Review* 60 (1): 45-66.
- Blau, Francine D. and Lawrence M. Kahn. 2007. "The Gender Pay Gap." *The Economists' Voice* 4 (4): Article 5.
- Duncan, Otis D. and Beverly Duncan. 1955. "A Methodological Analysis of Segregation Indexes." *American Sociological Review* 20 (2): 210-217.
- England, Paula. 2005. "Gender Inequality in Labor Markets: The Role of Motherhood and Segregation." *Social Politics* 12 (2): 264-288.
- England, Paula, Paul Allison, and Yuxiao Wu. 2006. "Does bad pay cause occupations to feminize, Does feminization reduce pay, and How can we tell with longitudinal data?" *Social Science Research* 36 (2007): 1237-1256.
- Goldin, Claudia and Cecilia Rouse. 2000. "Orchestrating Impartiality: The Impact of 'Blind' Auditions on Female Musicians." *American Economic Review* 90: 715-41.
- Hill, Catherine, Christianne Corbett, and Andresse St. Rose. 2010. *Why so few? Women in Science, Technology, Engineering, and Mathematics*. Washington, DC: AAUW Research Report.
- Hulett, Denise M., Marc Bendick Jr, Sheila Y. Thomas, Francine Moccio. 2008. "Enhancing Women's Inclusion in Firefighting in the USA." *International Journal of Diversity in organizations, Communities and Nations* 8 (2): 189-207.
- Institute for Women's Policy Research. 2010a. *The Gender Wage Gap by Occupation*. Washington, DC: IWPR Fact Sheet. <<http://www.iwpr.org/pdf/C350a.pdf>>
- Institute for Women's Policy Research. 2010b. *The Gender Wage Gap: 2009*. Washington, DC: IWPR Fact Sheet. <<http://www.iwpr.org/pdf/C350.pdf>>
- King, Miriam, Steven Ruggles, Trent Alexander, Donna Leicach, and Matthew Sobek. 2009. Integrated Public Use Microdata Series, Current Population Survey: Version 2.0. Minneapolis, MN: Minnesota Population Center; <<http://cps.ipums.org>> (retrieved March 22, 2010).
- Levy, Frank and Peter Temin. 2007. "Inequality and Institutions in 20th Century America." NBER Working Papers 13106, National Bureau of Economic Research, Inc.
- Neumark, David. 1996. "Sex Discrimination in Restaurant Hiring: An Audit Study." *Quarterly Journal of Economics* 111: 915-41.
- U.S. Department of Health and Human Services. 2010. *The 2009 HHS Poverty Guidelines*. <<http://aspe.hhs.gov/poverty/09poverty.shtml>> (retrieved July 25, 2010).
- U.S. Department of Labor, Bureau of Labor Statistics. 2008. Table 1.11. *Education and training measurements by detailed occupation, 2008*. <http://www.bls.gov/emp/ep_table_111.htm> (retrieved June 11, 2010).
- U.S. Department of Labor, Bureau of Labor Statistics. *Occupational Variable Data Definitions*. 2010. <http://www.bls.gov/emp/ep_nem_definitions.htm#education> (retrieved June 11, 2010).
- U.S. Department of Labor U.S. Bureau of Labor Statistics. 2010b. "Highlights of Women's Earnings in 2009". Report 1025. June. <<http://www.bls.gov/cps/cpswom2009.pdf>> (retrieved February 2, 2010)
- U.S. Department of Labor U.S. Bureau of Labor Statistics. 2010c. *Household Data Annual Averages 7: Employment Status of the Civilian Noninstitutional Population 25 Years and Over by Educational Attainment, Sex, Race, and Hispanic or Latino Ethnicity*. <<http://www.bls.gov/cps/cpsaat7.pdf>> (retrieved June 11, 2010).

Notes

¹ The 1998 Carl D. Perkins Vocational and Technical Education Act defines an occupation as non-traditional for one sex if at least 75 percent of the workers in the occupation are of the other sex. “All workers” include full-time as well as part-time workers. Figures are based on IWPR compilation of data from the U.S. Department of Labor, Bureau of Labor Statistics. 2009. “Household Data Annual Averages. Table 11.” <<http://www.bls.gov/cps/cpsaat11.pdf>> (retrieved March 2010); see also IWPR 2010a.

² IWPR compilation of data from the U.S. Department of Labor, Bureau of Labor Statistics. 2009. “Household Data Annual Averages. Table 39.” <<http://www.bls.gov/cps/cpsaat39.pdf>> (retrieved March 2010).

³ The Index of Dissimilarity formula is, where: i stands for the number of female workers in occupations i , N_f stands for the number of female workers in the labor force, j for the number of male workers in occupation j , N_m for the number of male workers in the labor force, and N is the total number of occupations.

⁴ Following Blau and Hendricks (1979), we conduct a decomposition analysis of change in the Index of Dissimilarity (for workers aged 25 to 64). The first column (“Total”) shows the change in the value of the Index during each time period. The value of the Index in 1972 was 0.6821; in 1980 was 0.6186; in 1990 was 0.5292; in 2000 was 0.5070; and in 2009 was 0.5131. See Blau and Hendricks (1979) for an analysis of change in earlier decades; they found that during the 1960s, as we find for the 1990s, both the composition effect and the mix effect reduced occupational gender segregation.

	Total	Mix	Composition	Interaction
1972-1980	-0.0563	0.0395	-0.1052	0.0094
1980-1990	-0.0857	0.0059	-0.0604	-0.0313
1990-2000	-0.0274	-0.0087	-0.0146	-0.0040
2000-2009	0.0045	0.0093	-0.0005	-0.0043

⁵ Data for occupational segregation for workers with less than four years of college is shown in an aggregated manner because differences between sub-groups are not very marked.

⁶ Other factors found to contribute to the gender wage gap were coverage by collective bargaining, industry, education, experience and race composition of male versus female workers (Blau and Kahn 2006, 2007). Women still tend to work fewer hours due to their child care responsibilities. At the same time women on average have high levels of education compared with men. These two effects counterbalance each other and explain why the joint impact of education and work experience on the gender wage gap is relatively small. A relatively high percentage of the gap remains unexplained and results from either discrimination or unobservable differences in the characteristics of men and women. A few studies are based on experiments instead and show that gender discrimination does exist when it comes to determine wages. Two experimental studies have identified discrimination against women in the hiring process. Neumark (1996) finds that female applicants are less likely to receive job interviews and offers in high-paying restaurants in Philadelphia. Goldin and Rouse (2000) find that in ‘blind’ auditions more women are hired for US symphony orchestras. Another study by Babcock and Lachever (2003) points out that part of the wage gap results from the fact that women negotiate their earnings less than men. This could be taken as evidence for an immeasurable difference in the characteristics of men and women. But, Babcock and Lachever (2003) also find that when women do negotiate, they experience higher penalties and harsher treatment by employers than do men.

⁷ A full list of (re)classifications is available on request; please contact Ariane Hegewisch (hegewisch@iwpr.org).

⁸ All earnings data for specific occupations are based on U.S. Department of Labor, Bureau of Labor Statistics. 2009. “Household Data Annual Averages. Table 39.” This is the same data source that is used in Tables 2, 3, 4, and 5 and for Figure 6.

⁹ See U.S. Department of Health and Human Services (2010) for poverty guidelines for different sizes of families.

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