Coming Together? Trends in Black-White Occupational Segregation, 1980 to 2009

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Abstract

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Occupational segregation, the differential distribution of groups of workers across occupations, provides one of the most important mechanisms for creating, maintaining and legitimating social inequality. In this study I examine trends in occupational race segregation from 1980 through 2009/2010 and use fixed-effects regression analysis to assess how changes in occupational characteristics such as earnings, benefits and demographic composition are associated with changes in the representation of black men and women. My findings show that after 1980 trends toward racial occupational integration slowed and after 2000 may have began to reverse. Race and sex continue to be important for understanding the occupational distributions of black and white workers as black workers are disadvantaged relative to white workers and black men are especially disadvantaged.

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CHAPTER ONE
INTRODUCTION

Occupational segregation, the differential distribution of groups across occupations, provides one of the most important mechanisms for creating, maintaining and legitimating social and economic inequality (Lieberson 1980, Mouw and Kalleberg 2010). Because occupations are one of the primary means through which social and economic resources are distributed, the differential distribution of black and white workers across occupations leads to differences between them in access to resources such as income, wealth, prestige and opportunities for mobility (Baron and Newman 1990, Peterson and Morgan 1995, Reskin 1988).

Because discrimination against women and racial/ethnic minorities in hiring, job assignments and pay was legal and customary for much of U.S. history (Darity and Mason 1998), black and white workers experienced predictably high levels of occupational segregation. In 1960, for example, over half of black or white women and over 40 percent of black or white men would have had to change to a detailed occupation in which their group was underrepresented to have had the same occupational distributions as their same-sex counterparts (Cunningham and Zalokar 1992, King 1992).[1]

In the 1960s, however, the legal environment in which employers made decisions about hiring and job assignments changed (Reskin 1998, Tomaskovic-Devey and Stainback 2007). Congress passed The 1964 Civil Rights Act (CRA) which explicitly banned discrimination in hiring, pay, training and promotions based on race, ethnicity and/or sex by employers with at least 25 (later 15) employees. This act explicitly made it illegal for employers

[1] Occupational analysis can be conducted at a different levels of occupational detail, from broad occupational groups (e.g., Managerial and Professional Occupations) to more detailed occupations that more closely reflect the work being performed (e.g., Managers of medicine and health within the larger Managerial and Professional Occupations). I focus on detailed occupations in this study.

> "to limit, segregate, or classify employees in any way which would deprive or tend to deprive any individual of employment opportunities or otherwise adversely affect his status as an employee, because of such individual's race, color, religion, sex, or national origin." [Section 703]

This Civil Rights Act further created the Equal Employment Opportunity Commission (EEOC) to monitor employers' compliance with the law, mediate discrimination charges and bring lawsuits when necessary. In 1965 President Johnson went further, issuing Executive Order 11246 which prohibited federal contractors from discriminating on the bases of race or national ancestry and required contractors to take positive steps— or affirmative actions — to ensure that all workers were treated equally, regardless of race (Reskin 1998).

While it is difficult to assess the specific impacts of the CRA and affirmative action (Heckman and Payner 1989, Reskin 2000), occupational race and sex segregation declined dramatically between 1960 and 1980 (Cunningham and Zalokar 1992, King 1992). By 1980 the index of race segregation was 31 percentage points lower for black and white women and thirteen percentage points lower for black and white men than it had been in 1960. Only about one in three black or white workers would have needed to move into an occupation in which their race-sex group was under-represented for black and white same-sex workers to have had the same occupational distributions (King 1992).

Although segregation continued to decline throughout the 1980s, it did so at a much slower pace than it had during the previous two decades (King 1992, Jacobsen 1997). To the extent that the declines in segregation over the 1960s and 1970s stemmed from legal pressure on employers to provide equal employment opportunity (Kelly and Dobbin 1998, Stainback, Robinson and Tomaskovic-Devey 2005), the decline in the rate of occupational integration after 1980 also reflects important shifts in the legal environment and employers' personnel practices.

For example, the Reagan administration weakened the Equal Employment Opportunity Commission (EEOC) by cutting resources and appointing conservatives to head the agency. In addition, President Reagan appointed federal judges whose interpretations of the CRA were more conservative (Burstein and Monaghan 1986, Kelly and Dobbin 1998, Wood 1990).

Changes in the health of the economy also affected trends in levels of occupational segregation (Cherry 2001, Reskin and Roos 1990). During the 1960s and early1970s a robust U.S. economy provided ample new jobs that paid good wages without requiring extensive training and/or education. This job growth made it possible for employers to hire black workers while still giving preference to white workers. By the 1980s, however, the country was in recession and companies were eliminating positions not essential to productivity, automating production where possible and exporting many manufacturing jobs (Collins 1997, Kalleberg 2011, Wilson 1996). As a result, low-paying service jobs comprised a growing share of all jobs and unemployment increased. These economic changes fueled competition among low-skilled workers for better jobs (Michel, Bernstein and Shierholz 2009, Kalleberg 2011).

These legal and economic shifts have important implications for black-white social and economic inequality, in part through their effect on occupational segregation. We do not, however, have research on occupational segregation at the level of detailed occupations after 1990 and, therefore, do not know (1) whether the trend toward racial occupational integration continued through the 1990s and the 2000s, (2) where in the occupational structure segregation has increased or declined and (3) what factors have contributed to changes in the occupational distribution of black men and women between 1980 and 2009. Answers to these questions are crucial for assessing our progress, or lack thereof, toward greater racial equality in the U.S.

To address these questions, I examine trends in black-white occupational segregation since 1980, exploring where in the occupational structure African American's representation has shown substantial changes and identifying those factors contributing to observed trends. In addition, I examine whether or not observed changes in African Americans' representation across occupations exemplify real socioeconomic gains. Are African Americans moving into occupations that are better paying, confer higher status and provide more opportunities for upward mobility or are they simply moving from one set of low paying occupations to another?

CONCEPTUAL FRAMEWORK

Supply-side explanations for black-white occupational segregation and economic inequality center on differences between black and white workers in skills, education and experience (Moss and Tilly 2001, Reskin and Padavic 1999). While these differences certainly explain some of the disparities between black and white workers, they are incomplete. The research literature contains many studies pointing to demand-side and structural factors that shape the occupational and economic outcomes of black and white workers (Bertrand and Mullainathan 2004, Holzer 2001, Kirschenman and Neckerman 1991, Pager 2003, Royster 2003, Wilson 1987).

Demand side explanations are more complex—the motivation for discrimination can come from the employer, other workers or even customers—resulting in black-white inequality. Becker (1957) for example, argued that some employers have a "taste" for discrimination. Even if black labor is cheaper than white labor, these employers are said to be willing to pay higher wages to white men in order to indulge this taste. Over time, however, the lower cost of labor for those firms employing black (or other minority) workers should force discriminating firms to

either stop discriminating or go out of business. Split labor market and threat theories also posit discrimination against black workers; however, the source of discrimination is other workers in the firm, occupation, industry or labor market (Blalock 1967, Bonacich 1972, Huffman and Cohen 2004). These theories argue that because black labor is cheaper than white labor, if they compete successfully with white workers they could depress wages for all workers in the occupation and perhaps displace higher-priced white labor. White workers understand this threat and it is these workers that seek to exclude black workers from specific occupations and industries (Blalock 1967, Bonacich 1972). These theories, however, do not lend themselves to explaining changes in segregation over time.

Queuing theories (Hodge, 1973, Lieberson 1980, Reskin and Roos 1990, Thurow 1975) take both supply-side and demand-side factors into consideration and allow me to predict the conditions under which occupational race- and sex-composition should change. Queuing theories conceptualize labor markets as composed of two queues: labor queues composed of potential workers and job/occupational queues composed of occupations. The structure of these two queues distributes workers across occupations. Employers rank groups of workers in the labor queue according to their attractiveness based on worker qualifications and skill as well as ascriptive characteristics such as race and sex. Alternatively, workers rank occupations according to their desirability. Employers seek workers from as high in their labor queue as possible and workers seek occupations from as high in the occupational queue as possible. Because workers tend to share similar preferences about the desirability of good pay, opportunities for mobility, autonomy and job security among other factors (Jencks, Perman and Rainwater 1988, Kalleberg 2011), those workers who are most preferred by employers tend to work in more highly ranked occupations, while workers at the bottom of the labor queue tend to

be concentrated in those occupations at the bottom of the occupational queue or face high levels of unemployment (Hodge 1973, Lieberson 1980, Reskin and Roos 1990).

Properties of the Queues

Several properties of both labor queues and occupational queues are important for understanding the distribution of workers across occupations and how the demographic composition of occupations may change over time. The first property is the *ordering* of entities in the queue, whether these entities are groups of workers or occupations. In the occupational queue, workers rank occupations with the highest levels of pay, status, opportunities for upward mobility, autonomy and the most pleasant working conditions at the top of the queue.[2] Alternatively, those occupations with low pay, few benefits, unpleasant or dangerous working conditions and little prestige are ranked at the bottom of the occupational queue. Workers seek those occupations as far up the occupational queue as they can get (Lieberson 1980, Reskin and Roos 1990).

Thus, as Lieberson argues, if group X is the preferred group, then members of this group will tend to occupy the best jobs. Non-Xs will fill remaining jobs lower in the queue. If there are racial or ethnic distinctions among the remaining non-X workers (e.g., Y's and W's) and Y is preferred among these workers, then Ys will have the first opportunity to fill those positions that the Xs do not want or are not qualified for. This continues until all workers either fill a position or, if there are more workers than positions, the least desired workers will be unemployed (Hodge 1973, Lieberson 1980 p. 296).

Thus, if white men are the preferred workers, we would expect to see white men filling the majority of preferred occupations. On the other hand, if black women are the least preferred

[2] Of course, workers may have different preferences as they rank occupations. For example, migrant workers may be less focused on upward mobility in their current job compared to earning more money in the short term because they anticipate returning home (see Bonacich 1972).

workers, then black women should be concentrated in the least attractive occupations in terms of compensation, working conditions, stable employment and opportunities for mobility. This assumes that black and white workers are the only workers in the labor force.

A second property of labor and occupational queues is their *shape* (Reskin and Roos 1990). The number of positions at each rank of the occupational queue determines its shape. So a labor market with many low-ranked jobs and few highly ranked jobs will be larger at the bottom whereas a labor market with many attractive jobs and few low ranked jobs will be larger at the top. The impact of the shape of the occupational queue depends on the shape of the labor queue. If there are more highly ranked occupations than there are preferred workers who are qualified for such positions, then workers lower in the labor queue will gain access to some of those positions. This is expected to produce greater occupational integration. However, the fewer good jobs there are relative to the number of preferred workers, the greater the representation of preferred workers lower in the occupational queue. This means less preferred workers will be overrepresented lower in the occupational queue and among the unemployed. The shapes of both queues jointly impact each demographic group's distribution across occupations. As Lieberson (1980) argues, if group X is 10 percent of the labor force then group X will tend to occupy the most highly ranked 10 percent of jobs. This will allow non-X's to move further up the occupational queue than if group X were 20 percent of the labor force filling the top ranked 20 percent of jobs assuming the shape of the occupational queue is the same in both cases (Lieberson 1980, p. 297). Changes in the shape of either or both queues will also lead to change in the composition of occupations.

A final property of queues is the intensity or strength of the preferences of rankers. For labor queues, the intensity of employers' preferences or those of their agents shape the

distribution of workers across occupations. The stronger a ranker's preferences for some attribute such as whites, the more indifferent the ranker is to the qualifications of non-preferred workers. For example, an employer or hiring agent with a strong preference for white male workers in a job is less likely to hire black or white women or black men compared to a rater with more moderate preferences. In the latter case, while white men might be preferred, a highly qualified member of the non-preferred group might be hired over less qualified members of the preferred group. However, in the first case, the impact of qualifications such as education or experience will have less impact on access to better paying occupations in general (Reskin 1991, Reskin and Roos 1990). Also, the stronger a ranker's preferences are for members of a given racial/ethnic group, the less racial occupational integration we might expect in those occupations.

Changing Occupational Queues, Changing Labor Queues

Occupations tend to be relatively stable over time in their race-sex composition. Occupations that are highly ranked by workers have a tendency to remain relatively high in the occupational queue. This status is maintained by a number of factors, not the least of which is efforts by occupational incumbents to maintain their own earnings and status by reducing or eliminating competition while increasing demand for their services (Bonacich 1972, Tilly 1998, Weeden 2002). Strategies here include licensing, educational credentialing and unionization among others. The demographic composition of occupations also tends toward stasis because preferred workers tend to remain at the top of employers' labor queues and occupations that are filled by high-status workers tend to confer status on the occupation itself. Despite the inertial forces, the race-sex composition of occupations can and do change (King 1993, Reskin and Roos 1990, Strober and Tyack 1980, Tye 2004). Just as the basic properties of queues shape the

distribution of workers across occupations, changes in these properties can lead to changes in the distribution of workers across occupations.

Change in the shape or composition of the occupational queue. The distribution of workers across occupations can change when either the shape or the composition of the occupational queue changes. The differential growth or decline of occupations will have an impact on the shape of the occupational queue. For example, during World War II the demand for labor in manufacturing increased dramatically with profound impacts on the shape of the occupational queue. After World War II, the demands of returning soldiers and their families for housing resulted in an increased demand for construction workers, realtors and related occupations. Similarly, the baby boom generation created an increased demand for schools, and thus, more construction workers, teachers, principals and other school staff. The demands for workers in these occupations outstripped the supply of traditionally preferred workers and, as a result, lead to changes in the composition of workers in these occupations. Women and black workers gained access to jobs that would not have otherwise been available to them, resulting in changes in occupational race-sex composition (Milkman 1987).

Occupational queues may also change in shape or composition as occupations decline in size or disappear from the occupational queues. New technologies, for example, may reduce or eliminate positions within an occupation or occupations may be moved outside of the local labor market such as when companies move jobs to a different part of the U.S. or outsource them to countries with cheaper labor. Auto manufacturing epitomizes this process. Manufacturing of some parts were outsourced to developing countries while assembly plants moved from Detroit to the South. The reduced demand for workers results in workers lowest in the queue being pushed into other occupations or out of the labor market altogether. Over the course of the 20th

century we have seen this occur not only in manufacturing where there has been a substantial decline in the number of manufacturing jobs in the U.S. (Wilson 1996, Wilson and Wacquant 1989), but in farming as well, which saw a substantially smaller demand for workers due to technological innovations. To the extent that non-preferred workers are pushed out of the occupation as preferred workers fill the remaining jobs, the occupation's composition may become more homogeneous.

Change in the ordering of occupations in the occupational queue. Occupations may also change in ways that make them more or less attractive, leading to a shift in their position in the occupational queue. An occupation may change either because of technological changes or the way work is organized. The specific duties of workers may change; the rewards, benefits and prestige of the occupation may change; or workers' autonomy may change. If pay, benefits or working conditions improve, the occupation will move up in the occupational queue, and thereby become less accessible to workers from lower in the labor queue. A decline in occupational ranking may lead to higher ranking traditional workers fleeing the occupation which creates opportunities for workers lower in the labor queue. For example, pharmacy was a traditionally male occupation which had high levels of entrepreneurship, prestige, autonomy and earnings. As the occupation transformed around the middle of the 20th century, jobs became increasingly located in hospitals and drug stores, occupational duties became more routine and autonomy declined. These changes were associated with a decline in the entry of men into the occupation, creating an opportunity for women to increase their representation in the occupation, which they did (Phipps 1990).

The movement of men out of pharmacy and the movement of women into the occupation illustrate how changes in one occupation may create a chain effect. As higher ranked workers

abandon the occupation, workers lower in the labor queue move into the vacated occupation which, while not at the top of the occupational queue, is better than alternatives available.[3] Another example would be the exit of men from clerical occupations which allowed women with another alternative to the lower-paid service jobs to which young women had been relegated (Bird 1990, King 1993).

Change in the shape or composition of the labor queue. The composition of occupations can also change due to changes in the labor queue. The labor queue can increase in size, such as when women moved into the labor force in large numbers or when levels of immigration increase. To the extent that this increase results in larger numbers of qualified workers than employers in preferred occupations need, these excess workers may spill down the labor queue, displacing workers from occupations lower in the queue. Alternatively, the size of the labor queue can decline as it did following World War I when immigration almost ceased due to exclusionary immigration laws. As employers lost access to cheap European immigrant labor, they moved lower in the labor queue, to recruit black workers from the South. And again, during World War II employers pulled substantial numbers of women into occupations which had previously been male dominated occupations (Farley 1996, Milkman 1987).

Change in the ranking of the labor queue. A final factor contributing to a shift in the composition of occupations is change in the ranking of the labor queue. The rankings of different groups of workers in the labor queue may change for a number of reasons including changing attitudes toward the group such as when immigrant groups become assimilated into the dominant society. Other factors which can impact the ranking of workers in the labor queue are anti-discrimination laws, law suits and affirmative action mandates for government contractors. These factors may work to change the way employers view workers in different groups.

[3] This process closely resembles Harrison White's (1970) concept of "vacancy chains" but at the Meta level.

RESEARCH QUESTIONS

Despite the important role that occupational segregation plays in creating and maintaining racial inequality, there is a paucity of research at the level of detailed occupations after 1990.[4] In this dissertation I extend the analysis of black-white occupational segregation through 2009. I address three basic research questions in this dissertation: (1) what have been the trends in racial occupational segregation since 1980, (2) which, if any, subgroups of workers have become more integrated since 1980 and (2) what occupational characteristics are associated with changes in black men's and women's occupational distributions?

First, I extend King's (1992) analysis, documenting trends in occupational segregation through 2009. I further assess the degree to which changes in levels of black-white segregation are the result of changes in the occupational structure (i.e., changes in the sizes of more and less segregated occupations) relative to changes in the extent to which black and white same-sex workers increasingly or decreasingly entering the same occupations. To learn which categories of workers experienced increases and declines in segregation levels and to obtain some clues regarding the causes of these trends, I then estimate segregation trends for groups of workers defined by age, education and regional location.

I then turn to the question of what explains black worker's changing representation across occupations. To answer this question I use fixed-effects regression to evaluate the impact of changes within occupations on the share of jobs available to black men and women. This allows

[4] Although Tomaskovic-Devey and his colleagues have published several studies of racial occupational segregation through 2002, their unit of analysis is broad occupational categories such as "Professionals" (e.g., surgeons, airline pilots and teachers) and "Service Workers" (e.g., cooks, hairdressers, and railroad police). Because these broad categories contain substantial diversity in terms of the detailed occupations of which they are comprised (e.g., in earnings, prestige, autonomy, working conditions), they conceal important differences between detailed occupations that are likely relevant to their race composition.)

me to look at the relationship between occupational change and the changing representation of black men and women over time while controlling for stable occupational characteristics.

DISSERTATION STRUCTURE

The remainder of my dissertation is divided into four chapters. Chapter 2 provides an overview of methodological issues common to Chapters 3 and 4. Because Chapters 3 and 4 require different methods, I discuss these methods in detail within these analytic chapters.

Chapter 3 presents my analysis of both standardized and unstandardized Indices of Dissimilarity (D) for black and white workers in order to gauge overall trends in occupational segregation and to estimate the degree to which these trends are the result of changes in the occupational mix. I then estimate segregation trends for subgroups of black and white workers defined by age, education and region of the country. Chapter 4 presents the results of fixed effects regression analyses, separately for black men and women, which provide estimates of the impact of changes in occupational characteristics on changes in the proportional representation of black men and women. Finally, Chapter 5 summarizes my findings, discusses their implications for policy and points to directions for future research.

CHAPTER TWO
RESEARCH METHODS

To investigate the trends in black-white occupational segregation from 1980 to 2009 and the degree to which transformations in occupational characteristics were associated with black men's and women's employment in that occupation I draw upon two nationally representative data sources, the 5-percent Integrated Public Use Microdata Series (IPUMS) sample and the American Community Survey (ACS), also from IPUMS (Ruggles et al. 2010). Data for the decades from 1980 through 2000 are drawn from the 5-percent sample of the U.S. Census. Because these data are only available through 2000, to extend my analysis through 2009 I supplement them with data from the American Community Survey (ACS). Because the ACS has smaller samples than the 5-percent sample[5] I pool the ACS data for 2005 to 2009 to increase the reliability of my estimates.

To estimate the degree to which changes in occupational characteristics lead to changes in the representation of black men and women across detailed occupations, I use three data sources. I use both the IPUMS 5-percent sample and the American Community Survey as described above but in order to expand the number of variables available for my regression analysis (i.e., union rates, pensions, firm size); I also supplement these sources with data from the March Current Population Survey (CPS). Again, because of the much smaller sample size of the CPS, I pool three years of these data for each decade (e.g., for 2000 I pool data for 1998, 1999 and 2000).

I use the 3-digit detailed occupation codes for all the analyses. However, the occupational coding scheme used by the Bureau of the Census changed in both 1990 and 2000.

[5] The 5-percent data is a 1 in 20 sample of the population while the ACS is a 1 in 100 sample of the population.

To allow comparisons over time the Integrated Public Use Microdata Series provides an "occ1990" variable which recodes occupations in all years according to the 1990 coding scheme. This recoded variable is available in all datasets used here and I use it in all my analyses.

ANALYTICAL CONSIDERATIONS

Below I discuss key analytical decisions common to all analyses in this dissertation, namely the decisions to focus on detailed occupations, on black and white workers, full-time, full year workers and to conduct all analyses separately for men and women.

Detailed Occupations

This study focuses on trends in black-white occupational segregation among women and men across *detailed* census occupations since 1980. I focus on detailed occupations because they provide a greater approximation of the degree to which black and white workers have similar experiences in the world of work and experience similar benefits such as access to income and prestige from their work. Black men and women in the US have historically been excluded from a wide range of occupations, especially those paying high wages and providing benefits. As the legal and social landscape shifted and black workers began to gain entry to better occupations, they often remained restricted to those positions providing the least remuneration and job security (Collins 1997, Grodsky and Pager 2001). Because broad occupational groupings, such as those collected by the EEOC, mask these differences in occupational distributions and the associated disparities in access to economic resources, I have chosen to focus on detailed occupations.

I have also chosen to focus on detailed occupations because of the implications for equal-status interactions among black and white workers, which are necessary to undermine racial prejudice (Pettigrew and Tropp 2006). Because blacks and whites tend to live in different communities and neighborhoods (Charles 2003), the workplace provides one of the few settings in which blacks and whites interact on a regular basis and at least approximately as equals. However, black and white workers who share the same broad occupational grouping but work in different detailed occupations are more likely to differ in social status and power. These differences reduce the likelihood for equal status interactions and make it easier for majority group members to exaggerate differences between themselves and minority group members which helps maintain a devalued status for black workers (Brezina and Winder 2003; Reskin 1988; Ridgeway 1991).

Full-Time, Full-Year Workers

Access to the social and economic rewards of work depends not only on the occupation one holds but also on whether one works on a consistent basis. Since the 1970s employers have increasingly used non-standard forms of employment to maximize flexibility in scheduling around peak work periods and to cut labor costs and long-term employment commitments. This has resulted in the growth of the involuntary part-time workforce (Kalleberg 2000; 2011).[6] These non-standard types of employment differ from standard full-time, full-year (hereafter FTFY) employment in access to the rewards of work including earnings, job security, pensions and employer-provided health insurance (Kalleberg 2000; Tilly 1996). Focusing on FTFY workers provides a partial control for access to the more desirable jobs within occupations and

[6] For example, the Economic Policy Institute estimates that nearly 6 million part-time workers would prefer full time employment (Shierholz 2011).

therefore permits a stronger assessment of the extent of black progress in access to the same kinds of work as whites. Thus, my primary analyses focus on FTFY workers.

To assess the effect of focusing on FTFY workers, I compare estimates of occupational segregation for all workers with those for FTFY workers by sex for each decade from 1980 through 2009. The results, which appear in the last four rows of Table 3.1, show FTFY workers are as segregated or slightly more segregated than all same-sex workers. Importantly, however, the trends for the two populations of workers are the same over time.

Black and White Workers

I limit my analyses to non-Hispanic black and white workers. I do this for several reasons. First, while all nonwhite racial and ethnic groups in the U.S. face some disadvantages in the labor market relative to white workers, each has a unique history of inequality and face different barriers in the labor market. The history of labor market inequality for African Americans differs substantially from all other groups (Jones 1985, Lieberson 1980). Further, while black workers made substantial occupational gains in the post-Civil Rights period, there is evidence that these labor market gains have slowed or even reversed (Dozier 2010, Pettit and Ewert 2009, Tomaskovic-Devey and Stainback 2007).

Same-Sex Workers

While my primary focus is on racial occupational segregation, workers do not enter the labor market only as racial beings but also as men and women (Collins 1993). And one's sex continues to play a crucial role in shaping occupational outcomes (Charles and Grusky 2004, Hegewisch et al. 2010). While there is debate around the causes of high levels of occupational

sex segregation, over 50 percent of men or women would have needed to switch to an occupation in which their sex was underrepresented for men and women to have had the same occupational distributions in 2009 (Hegewisch et al. 2010, see also Charles and Grusky 2004). For this reason, all analyses are conducted for men and women separately. Focusing on black-white segregation among both women and men allows me to examine how race and sex interact to shape access to economic resources. I believe this is especially important for women where because there has been much less research into the disparities between black and white women than there has been for black and white men.

CHAPTER THREE
TRENDS IN BLACK-WHITE OCCUPATIONAL SEGREGATION, 1980 To 2009

In this chapter I document trends in black-white occupational segregation between 1980 and 2009 and I estimate segregation trends for subgroups of workers defined by education, age and region of the country. Because we distribute social and economic resources such as income, wealth and prestige through occupations, occupations form a key mechanism for creating and maintaining social and economic inequality (Lieberson 1980, Mouw and Kalleberg 2010, Baron and Newman 1990, Reskin 1988). Despite the importance of occupational segregation for understanding and addressing racial inequality, there has been relatively little research on black-white occupational segregation since 1990. Black workers have historically been limited to and concentrated in a small number of occupations with low pay and poor working conditions. For example, in 1940 over three-fourths of black women were employed as either private household workers or farm laborers and forty-one percent of black men were employed in agriculture (Cunningham and Zalokar 1992, King 1992).

While black workers began to become less occupationally concentrated after 1940, between 1960 and 1980 there were historic declines in the level of black-white occupational segregation. This trend toward integration slowed after 1980 but continued through 1990. We do not know if this trend toward integration has continued, stalled or reversed for either men or women since 1990 because no research has measured black-white segregation at the level of detailed occupations beyond 1990. There is, however, reason for concern. Research by Tomaskovic-Devey and Stainback (2007) estimated the trend from 1966 through 2002 in the degree to which black and white workers within private-sector workplaces were employed in the

same *broad* occupational group.[7] Their estimates of within-establishment occupational segregation for black and white men show declines in segregation continuing through 2002. Their findings for black and white women, however, point to increased segregation after the mid-1970s, in contrast to studies at the level of detailed occupations (Jacobsen 1997, King 1992). In fact, Tomaskovic-Devey and his coauthors found that black and white women were as occupationally segregated at the firm level in 2002 as they had been in 1966.

While Tomaskovic-Devey and Stainback (2007) advanced our knowledge of the extent of segregation within private-sector workplaces, their analyses could not assess the substantial segregation that exists *within* broad occupational categories. For example, EEO-1 data aggregate very different detailed occupations (e.g., physicians and registered nurses) into the same broad occupational groups (professional). In addition to the loss of a great deal of occupational detail, EEO-1 data omit large segments of the workforce. As recently as 2002 almost 30 percent of EEO-1 workplaces employed no black women, and 21 percent employed no black men and, therefore, are not included in the segregation index for establishments (Tomaskovic-Devey and Stainback 2007).

Further, EEO-1 reports include only private-sector establishments, a setting in which black workers are under-represented. In 2000, according to the Current Population Survey (CPS), over 20 percent of black women and men were employed in local, state and federal jobs compared to 14 and 16 percent of white men and women respectively. Finally, 38 percent of all workers are employed in *firms* with fewer than 100 employees, according to the CPS. Because the EEO-1 data include only establishments with at least 100 workers (at least 50 for federal contractors), a considerable number of establishments are omitted from analyses of EEO-1 data.

[7] Broad occupation groups aggregate very different detailed occupations into the same general categories. For example the broad occupational group "Service Workers" include bartenders, cooks, medical assistants, hairdressers and ushers. See also Stainback, Robinson and Tomaskovic-Devey (2005), and Robinson et al.,(2005).

In sum, the EEO-1 data provide important information about trends in black-white segregation in moderate to large private establishments but they cannot address the degree to which all blacks and whites in the labor force have equal access to the full range of occupations and to the rewards of those occupations.

The census three-digit occupation data have a different limitation relative to the EEO-1 data in that they aggregate occupational data across firms and industries. By triangulating through the use of these different data sets with different levels of aggregation, however, we can get a better sense of the trends in black-white occupational segregation over the last half century. Together these two streams of research based on differently detailed data for differently detailed entities—segregation across all detailed occupations based on census data and segregation across broad occupational groupings within private workplaces—provide a better understanding of black-white occupational segregation trends than either can provide separately.

RESEARCH QUESTIONS

Black-White Segregation Trends

The primary goal of this chapter is to assess trends in occupational race segregation at the level of detailed occupations since 1980 and to determine which subgroups enjoyed the greatest progress and which, if any, lost ground. King (1992) calculated the segregation index for black and white men and women from 1940 through 1988 at the level of detailed occupations. Her research showed that segregation began to decline after 1940, especially for women. After 1960, however, the declines for both men and women were more dramatic. Her analyses stop with 1988, however. In this chapter I extend her analysis through 2009.

Further, because segregation trends capture both the movement of workers between occupations in which they are disproportionately represented and changes in the relative sizes of more and less segregation occupations, I calculate standardized segregation indices which hold the occupational structure constant, allowing me to determine what proportion of change in my segregation measures are the result of black and white workers increasingly entering the same occupations and what proportion is the result of changes in the occupational structure.

Segregation Trends for Subgroups of Workers

Those workers most preferred by employers tend to fill the more highly ranked occupations (Lieberson 1980, Reskin and Roos 199). Historically, white men have occupied the top of employers' labor queues with white women and black men below them and black women at the bottom of the labor queue (King 1993, Lieberson 1980). Beyond race and sex, however, queuing theory highlights the fact that employers' preferences can change over time and that their preferences interact with the size of the qualified labor pool. Thus, I assess segregation trends for subgroups of workers defined by educational attainment, age and regional distributions.

Employers use workers' educational attainment as a primary indicator of their qualifications and likely productivity. Black and white workers, however, differ in their levels of educational attainment. In order to compare only black and white workers with similar educational credentials, I assess segregation trends for subgroups of workers defined by levels of education. To the extent that worker qualifications are more important than ascriptive characteristics such as race in ordering the labor queue, there should be no relationship between

educational attainment and levels of occupational segregation. That is, workers with less than a high school diploma should not be more or less segregated than workers with a college degree.

Next, because different age cohorts experienced different social, economic and legal environments that would have shaped employers' preferences for groups of workers, I estimate segregation trends for five age cohorts, 18-24, 25-34, 35-44, 45-54 and 55 and older. Younger workers would have entered the labor market after the passage of the Civil Rights Act and after public attitudes towards racial discrimination began to change. Younger black workers would also have had more and better quality education than their older counterparts making them more similar to their white counterparts and, as a result, they should be less segregated than older workers.[8] Further, because of legal and social changes, I expect segregation levels for all age groups to have declined over time.

Finally, the South has historically had a more rigid and hierarchical system of race relations relative to the rest of the country. According to King (1992), from 1960 through 1988 black and white workers were more occupationally segregated in the South than in the rest of the nation. However, her data also shows that segregation in the South was declining at a faster rate than in the remainder of the country. Further, black workers are moving to the South in large numbers, increasing their share of the population and the workforce in the South (Frey 2004, McKinnon 2001). For example, McKinnon reports that in 2000 47 percent of all blacks lived in ten states in the South comprising over 25 percent of the population in six states including Mississippi (37 percent), Louisiana (33 percent), South Carolina (30 percent) and Georgia (29 percent). In 95 counties in the South blacks comprise over 50 percent of the population (McKinnon 2001). Employers in the South therefore, may need to hire workers further down in

[8] Differences between age cohorts in cross-sectional analyses do not allow me to isolate the unique effects of age relative to cohort effects on occupational segregation.

their labor queues. Thus, to assess the importance of blacks' share of the labor force for recent nationwide segregation trends, I estimate black-white segregation trends by region.

DATA AND METHODS

Data

To estimate trends in the degree of occupational segregation, I draw upon two data sources. The first is the 5-percent Integrated Public Use Microdata Series from the Minnesota Population Center (Ruggles et al., 2010). I use the 3-digit (detailed) occupational codes for all analyses. However, the specific occupations and the way in which these occupations have been categorized have changed over the period of interest, with revised occupational coding schemes introduced in both the 1990 and 2000 Censuses. Fortunately, the Integrated Public Use Microdata Series (IPUMS) provides a classification scheme that recodes the 1980 and 2000 data according to the 1990 standardized categorization in order to facilitate comparisons over time. I use this 1990 re-categorization ("occ1990") in all analyses reported here.[9] I use the American Community Survey to extend my analysis of occupational segregation through 2009.[10] Because the American Community Survey (ACS) is based on a smaller sample size than the 5-percent IPUMS, I pool the data for 2005-2009 to increase the reliability of my estimates.[11]

[9] The 1990 standardized coding scheme is available for 384 occupations, including 49 occupations which contain no observations in either 1980 or 2000. Following King (1992), I drop those occupations not available in all three decades to ensure that I am comparing a consistent set of occupations over time. Dropping these occupations reduces the total number of occupations used for all analyses from 384 to 335. To assess the sensitivity of my results to dropping these occupations, I compared estimates of segregation using all 384 occupations to those with only the 335 occupations. Dropping the 49 occupations modestly affected only two estimates: the estimated 1990 segregation index for black and white men increased by one percentage point as did the 2000 estimate for black and white women. Therefore, excluding these occupations does not systematically affect my results.

[10] The ACS also provides an Occ1990 variable which recodes the 2005 through 2009 data according to the 1990 occupational coding scheme used by the Census Bureau.

[11] There were over four million observations for my 2000 sample drawn from the five-percent census, while each year from 2005-09 the American Community Survey samples averaged just under 900,000 observations.

Methods

Occupational segregation refers to the differential distributions of two or more groups across a set of occupations (Jacobs 1989). The most common measure of the extent of segregation is the index of dissimilarity (Duncan and Duncan 1955). The index of dissimilarity (D) ranges in value from 0 to 1 where 0 represents identical distributions of workers from both groups across occupations and a value of 1 indicates complete segregation such that no workers from the two groups share a common occupation. The index of dissimilarity for black and white men, for example, is calculated as:

$$D = \frac{\sum |P_{bm} - P_{wm}|}{2}$$

Where:

P_{bm} is the proportion of black men in occupation i and
P_{wm} is the proportion of white men in occupation i.

D indicates the proportion of workers of either group who would have to change to an occupation in which their group is under-represented in order for the two groups to have identical distributions across occupations. For example, as I show below, in 2000 the index of dissimilarity for black and white women across detailed occupations was .24, indicating that 24 percent of either black or white women would need to switch from an occupation in which their group was over-represented to one in which their group was under-represented for both groups to be identically distributed across occupations.

There are, however, two issues to bear in mind when interpreting D. First, the unit of analysis matters. The more aggregated the occupational groupings used, the lower the index of segregation because highly aggregated occupational categories include but cannot distinguish among heterogeneous detailed occupational categories that vary in the extent to which two

groups are evenly represented. For example, in 2000 black women made up 27 percent of all women in the aggregated "Health Service Occupation". However, within the broader category Health Service Occupation, black women made up just seven percent of all female *dental assistants*, 15 percent of female *health aides outside of nursing* and 34 percent of female *nursing aides and orderlies*. Thus, disaggregating broad occupational groups reveals substantial variation in the race composition of detailed occupations and hence the amount of within subspecialty racial segregation. Of course, segregation almost certainly also exists within detailed occupations because workers in the same occupation work in different industries, firms, and parts of the country. Thus, focusing on the specific *jobs* that people do within detailed occupations captures even more segregation (Bielby and Baron 1984, Tomaskovic-Devey and Stainback 2007).

A Second issue to bear in mind when interpreting trends in D is that there are two sources of change in its value. D captures both (1) changes in the sizes of more or less integrated occupations and (2) changes over time in the black-white composition of each occupation. For example, black workers are under-represented in professional occupations relative to their share of the population, so to the extent that professional occupations employ an increasing share of *all* workers but black workers' share of these occupations remained stable, the value of D will increase. Therefore, I also calculate standardized indices because they hold the occupational structure constant (see Gibbs 1965, Jacobs 1989). The standardized index for black and white men is computed as:

$$D_{standardized} = 1/2 \sum|[(W_i/T_i)/\sum(W_i/T_i)] - [(B_i/T_i)/\sum(B_i/T_i)]|$$

Where:

W_i is the proportion of white men in occupation i
B_i is the proportion of black men in occupation i
T_i is the total number of black and white workers in occupation i

Calculating both the more common unstandardized segregation index as well as the standardized index allows me to estimate the proportion of change in levels of segregation attributable to each source.

RESULTS

Trends in Black-White Occupational Segregation

Between 1960 and 2000 segregation levels declined continuously for both women and men, as shown in Table 3.1. In the 20 years from 1960 to 1980 both men and women experienced sharp declines in the value of the segregation index, although the index for women dropped at more than twice the rate for men. For men the segregation index dropped at an average of six-tenths of a point per year, while for women the index fell by an average of 1.4 points per year. Indeed, while women began the 1960s with much higher rates of segregation than men, by 1980 women were less segregated.

Table 3.1. Segregation Indices for all Black and White Workers and Full-time, Full Year[a] Workers by Sex, 1960 to 2009.

	Women			Men		
	ALL Workers	**FTFY Workers**	**Percent FTFY**	**ALL Workers**	**FTFY Workers**	**Percent FTFY**
1960[b]	.56	-	-	.44	-	-
1970[b]	.41	-	-	.38	-	-
1980	.27	.29	38%	.32	.34	61%
1990	.26	.26	44%	.31	.32	62%
2000	.24	.24	47%	.28	.29	63%
2005-09	.24	.24	62%	.28	.29	64%

Based on 335 occupations from the Integrated Public Use Microdata Series.
2005-2009 data are from the American Community Survey.
[a]Full-time, full year is defined as working 35 or more hours per week and at least 50 weeks a year
[b] Values taken from King 1992.

After 1980, however, the rate of decline slowed dramatically for both sexes. Neither women nor men experienced average annual declines in segregation of more than three-tenths of a point. As a result, in spite of the continuing trend toward occupational integration between 1960 and 2000, in 2000 just under one-third of black or white men and slightly less than one-fourth of black or white women would have had to change their occupation for same-sex black and white workers to be identically distributed across occupations, as Table 3.1 shows. The last row in Table 3.1 shows estimates of segregation for 2005 to 2009 (2009 hereafter) based on data pooled across these years from the American Community Survey. According to these estimates, after 2000 black-white integration stalled. Thus, from 1960 to 1980 segregation declined dramatically, from 1980 to 2000 it continued to decline but at a much slower pace and after 2000 it came to a halt.

Sources of Change

To determine what proportion of the reduction in segregation between 1980 and 2009 stems from changes in the occupational distributions of black and/or white workers and how much is due to changes in the relative sizes of more and less segregated occupations, I calculate standardized segregation indices. As noted above, the standardized indices hold the occupational structure constant and, by comparing them with the unstandardized indices, I can estimate the proportion of change attributable to each source.

The standardized and unstandardized segregation indices for 1980 through 2009 appear in Table 3.2.[12] Between 1980 and 2000 the unstandardized indices fell by five points for both sexes, while the standardized indices fell by just two points for women and three points for men.

[12] The values in columns 1 and 3 of Table 3.2 are identical to those for FTFY workers in Table 3.1 for 1980 through 2007-09. I include them here to facilitate within-table comparisons.

This indicates that changes in the occupational structure – either the growth of already relatively integrated occupations and/or the shrinkage of more segregated occupations – accounted for about half of the declines in segregation for both sexes. For example, the detailed occupation *personnel, human relations and labor relations* exemplifies an integrated occupation in which black women's share of all women remained relatively stable (13.0 percent of all women in 1980 and 13.7 percent in 2000) however, between 1980 and 2000 it doubled in size and women's share of *personnel, human relations and labor relations* workers increased from 45 percent to 65 percent, thereby increasing the numbers of both black and white of women employed in a relatively integrated occupation. Thus, occupational growth — particularly the growth of female workers — contributed to the decline in the index of segregation for black and white women.

Table 3.2. Size Standardized and Unstandardized Segregation Indices for Full-time, Full Year Black and White Workers, 1980 to 2009.

	Black and White Women		**Black and White Men**	
	Unstandardized	Standardized	Unstandardized	Standardized
1980	.29	.28	.34	.33
1990	.26	.27	.32	.30
2000	.24	.26	.29	.30
2005-09	.24	.27	.29	.30

Based on 335 occupations from the Integrated Public Use Microdata Series.
2005-2009 data are from the American Community Survey.

In contrast, consider *sales engineers*, a predominantly male occupation that has traditionally employed few black men. In both 1980 and 2000 black men represented less than two percent of *sales engineers*. However, the total number of workers in this occupation fell by one-fifth over the 20 years from 1980 to 2000. The shrinking of this still segregated occupation contributed to a decline in the unstandardized estimate of segregation for men.

The last row in Table 3.2 shows estimates for 2009. These estimates suggest that the trend toward integration stalled after 2000 for men and may have reversed for women. Although

the unstandardized indices show no change in segregation levels for either sex after 2000, the standardized index, which adjusts for changes in occupational size, shows that the trend toward integration halted for men after 1990, while women became slightly more segregated after 2000. In sum, from 1960 to 2000 more black workers pursued the same occupations as same-sex white workers, consistent with increasingly equal access to full-time, full year employment. However, after 1980 occupational integration slowed, and after 2000 it appears to have stalled for men and reversed for women.

While it would be unreasonable to expect black and white workers to be identically distributed across occupations, the above findings, along with those of Tomaskovic-Devey and Stainback (2007), point to unduly high levels of labor market segregation.

OCCUPATIONAL SEGREGATION, EDUCATION, AGE AND REGION

The analyses summarized in Tables 3.1 and 3.2 provide a broad picture of recent trends in occupational integration for all full-time, full-year black and white same-sex workers. The above discussion also highlights the fact that the results depend on the way the data are disaggregated (e.g., broad occupational groups or detailed census occupations). To make sense of these trends, a queuing perspective points to the value of breaking the data down in a way that takes into account changes in the supplies of qualified black and white workers and in the strengths of employers' preferences for various groups of workers. Specifically, queuing theory implies that members of more recent age cohorts, those employed outside the South and those with more education should have become more occupationally integrated over the last two decades because these factors should have affected black workers' location in the labor queue.

To determine whether and to what extent segregation varied by these characteristics, I now turn to trends in occupational segregation for these subgroups.

Education and Occupational Segregation

While there is disagreement over whether minimum educational requirements reflect the functional requirements of people's jobs (Collins 1971; Schofer and Meyer 2005), many occupations require some minimum level of education. We would not, however, expect there to be a relationship between educational attainment and the level of race-based occupational segregation if (1) workers were not ranked in the labor queue by ascriptive characteristics such as race and (2) both black and white workers' educational distributions were similar. First, the way employers rank the labor queue matters. When workers are ranked primarily by their race, even the most highly qualified black workers will lose out on occupational opportunities, putting upward pressure on segregation. However, the role of race in the ordering of the labor queue has been greatly reduced by both laws enacted in the 1960s that outlawed discrimination in hiring and job assignment and changing norms around workplace discrimination.

Second, the relationship between educational attainment and levels of occupational segregation should have declined to the extent that black and white workers' educational distributions became more similar. Historically, black workers lagged behind white workers in levels of educational attainment (Lieberson 1980). In 1970, for example, just over 30 percent of black men and women had at least a high school diploma compared to over 50 percent of white men and women. By 2009 the differences were much smaller with 84 percent of black men and 87 percent of white men having a least a high school diploma. The respective numbers for black and white women are 84 percent and 88 percent. In contrast, the differences between black and

white same sex workers in completing at least four years of college has actually increased between 1980 and 2009 (U.S. Census Bureau 2012, table 230).[13] Thus, because aggregate estimates of occupational segregation reflect differences between black and white workers in levels of educational attainment, I disaggregate the data for women and men divided into four levels of educational attainment: less than a high school diploma, only a high school diploma, some college and at least a bachelor's degree.

Table 3.3. Segregation Indices for Full-time, Full Year Black and White Same-Sex Workers by Level of Education, 1980, 2000 and 2009.

	Black and White Women			Black and White Men		
	1980	**2000**	**2009**	**1980**	**2000**	**2009**
Aggregate D Value	**.29**	**.24**	**.24**	**.34**	**.29**	**.29**
Education						
Less than high school	.33	.28	.31	.29	.25	.28
High school	.32	.27	.28	.32	.27	.28
Some college	.29	.21	.22	.33	.27	.28
Bachelor's or more	.19	.17	.17	.27	.24	.23

Based on 335 occupations from the Integrated Public Use Microdata Series.
2005-2009 data are from the American Community Survey.

As Table 3.3 reveals, there is a substantial and consistent relationship between women's educational attainment and segregation levels in all three decades. For all three time periods, women with the highest levels of education were the least segregated by race, while women with the lowest levels of education have much higher segregation indices. In contrast, the segregation indices for men show a non-linear relationship to educational attainment in 1980 and 2000 with the lowest levels of segregation at the highest and lowest ends of the educational continuum. By 2009, however, the only effect of education for men was whether or not they had completed at

[13] These data refer to the proportion of workers aged 25 and over.

least a bachelor's degree which increased racial integration compared to workers with less education.

Trends by educational attainment. Between 1980 and 2000 segregation fell for men and women at all levels of educational attainment. The smallest declines occurred for the most educated. From 2000 to 2009, while segregation levels remained relatively stable for most educational groups among both women and men, the least educated--those with less than a high school diploma--became slightly more segregated.

Finally, while educational attainment affects segregation levels for both sexes, it matters more for women. Women with less than a high school diploma are more segregated than similarly educated men; women with more than a high school diploma are less segregated than men with similar levels of education, and the benefits of education for women increase at each successively higher level of education.

These results are consistent with the perspective that race and other ascriptive characteristics still play a role in how employers order the labor queue. Race appears to be less influential, however, for the most educated workers. The facts that the relationship between education and segregation is less apparent for men than for women and that it weakens among men over time, demonstrates the interaction of race and sex within the labor market. Thus, while education appears to provide a more equal path toward greater access to the full range of occupational options, it does not produce this path uniformly. Further, the increases in segregation between 2000 and 2009 for less educated workers and the lack of continuing declines for those with at least four years of higher education are consistent with black workers being bumped from jobs during an economic recession. This highlights the need for a continued focus on racial inequality and the use of race in hiring and job assignment.

Age and Occupational Segregation

Next I examine segregation trends across age cohorts. I disaggregate the data into five age cohorts who entered the workforce under very different economic conditions and rules of competition.[14] For example, in 1980 workers in the oldest age cohorts, those age 45 to 54 and those 55 and older would have been born before 1936. Members of these cohorts, even in northern states (Lieberson 1980, pp. 234-37), would have attended segregated schools and attained fewer years of formal education than members of younger cohorts. Both black and white workers who were born before 1935 would have entered a labor market in which occupational segregation and discrimination were legal and normative (Darity and Mason 1998). Thus, race would have played a central role in ordering the labor queue for these workers with black men and women at the bottom of employers' labor queues. In addition, because workers' initial jobs are influential in shaping their later occupational opportunities (Tomaskovic-Devey et al. 2005), a restrictive range of occupational opportunities for older black workers' have implications both for segregation levels at the time of entry into the labor market and throughout their careers.

In contrast, workers born after the mid-1940s – those entering the labor market in the mid-1960s -- not only entered a labor market in which discrimination and segregation were illegal but, one in which public attitudes toward discrimination were shifting. To assess the relationship between age and segregation, I examine segregation for five cohorts aged 18-24, 25-34, 35-44, 45-54 and 55 and older. Table 3.4 shows the segregation indices for each age cohort in 1980, 2000, and 2009.

[14] As noted above, these analyses use cross-sectional data which do not allow me to separate the effects of age from the effects of the cohort.

Table 3.4. Segregation Indices for Full-Time, Full Year Black and White Same-Sex Workers by Age Cohort, 1980, 2000 and 2009.

		Black and White Women			Black and White Men		
		1980	2000	2009	1980	2000	2009
Aggregate D value		**.29**	**.24**	**.24**	**.34**	**.29**	**.29**
Age Cohort	**Born**						
18 through 24	**1956-1962**	**.28**	.22	.25	**.29**	.25	.27
25 through 34	**1946-1955**	**.28**	.24	.25	**.32**	.28	.28
35 through 44	**1936-1945**	.31	**.23**	.24	.35	**.29**	.29
45 through 54	**1926-1935**	.37	**.24**	.25	.39	**.29**	.30
55 and over	**1925 or earlier**	.42	.32	.28	.43	.35	.33

Based on 335 occupations from the Integrated Public Use Microdata Series.
2005-2009 data are from the American Community Survey.
The diagonal line traces the movement of the youngest two cohorts from 1980 through 2000

Segregation by age cohort. The results in Table 3.4 support my expectation that older cohorts were more segregated than younger cohorts in 1980 and 2000. The first and fourth columns of Table 3.4 shows a strong relationship between segregation and age in 1980: segregation increased for each older cohort and there is a 14-point difference between the youngest and oldest cohorts of men and women. This pattern is consistent with prevalent race-based barriers that black men and women faced when entering the labor market in the late 1920s and early 1930s.

Because most workers in the oldest cohorts in 1980 would have left the labor market by 2000, the second and fifth columns in Table 3.4 shows segregation indices for men and women from cohorts whose workers would have entered the labor market after Congress outlawed race segregation. Thus, from a queuing perspective, the relationship between age and segregation should have weakened because employers were more restrained in their ability to use race in ordering the labor queue. The data are consistent with this expectation. While the oldest cohorts remained more segregated than the youngest, the pattern was weaker and differences between age cohorts had diminished for both men and women.

By 2009, the relationship between age and segregation had weakened further. For men in 2009 segregation consistently increased as you move to older cohorts but the increases were small. Among women in 2009 there is no clear pattern. Although the oldest age cohort remains the most segregated, the differences between cohorts are much smaller than in 1980 or 2000.

Trends in across-cohort segregation. Table 3.4 also shows that between 1980 and 2000, segregation declined for all age cohorts and for both sexes. Workers aged 18 to 24 in 2000 were less segregated than 18 to 24 year olds in 1980, six points lower for women and four points lower for men. Similarly, while men and women 55 and older continued to be more segregated than younger workers; they were eight to ten points less segregated than their counterparts 20 years earlier. This is consistent with the declining representation among older workers of those who had faced the greatest race-based barriers who would have left the labor market. Columns three and six in Table 3.4 show the segregation indices for each age cohort in 2009. The data show that the trend toward integration did not continue through 2009; segregation levels remained relatively stable or increased for most cohorts from 2000 to 2009 and only workers 55 and over experienced a further decline in segregation.

Trends in within-cohort segregation. I now turn to how the extent of segregation changed as workers aged. For example, workers in the 18-24 age cohort in 1980 would have been in the 35-44 cohort in 2000; workers in the 25-34 cohort in 1980 are in the 45-54 cohort in 2000 (these scores are bolded). Among women, the two youngest cohorts experienced a decline in segregation as they aged.[15] Among men, however, only those aged 25 to 34 experienced a decline in segregation. Thus, not only did segregation decline for each younger cohort of women, but segregation also declined for women over the span of their careers through 2000.

[15] Because my 2009 estimates are based on data from 2005 through 2009, it is not clear that these data actually reflect workers in the younger cohorts in 1980 and 2000 so I do not follow any cohort through 2009.

Regional Distribution and Segregation

From a queuing perspective, the strength of employers' preferences for groups of workers and the composition of the labor queue are two crucial factors in employers' hiring decisions and thus, the distribution of black and white workers across occupations. Black workers in the US have historically faced high levels of discrimination but southern states produced a system of social, cultural and legal inequality that set the South apart from the rest of the nation (Lieberson 1980, Massey 2007). Outside of the most menial jobs such as those in agriculture, general laborers and housekeeping, black men and women were relegated to the bottom of employers' labor queues and, as a result, black-white occupational segregation was higher in the South than in the remainder of the country (Jones 1985, King 1992, Tye 2004). As argued above, however, the passage of anti-discrimination legislation, including the Civil Rights Act of 1964 but also state and county laws passed prior to the CRA (Bell 1980), and changes in attitudes toward racial discrimination increased the costs to employers of indulging their preferences for white workers over equally qualified black workers. After a generation of anti-discrimination laws and declining racial animus, southern employers' preferences for white labor should have weakened.

In addition to these legal and social changes, demographic changes also have practical implications for the composition of the labor queue that employers face. First, the African American population is disproportionately concentrated in the South. In 2000, forty-seven percent of the black population lived in ten southern states and in six they comprised over one-quarter of the population (McKinnon 2001). Therefore, the composition of the labor queue should lead to greater occupational integration. Second, the return-migration of many African Americans to the South, especially those who are younger and better educated (Frey 2004, Hunt, Hunt and Falk 2008, Tolnay 2003), should raise black workers in the labor queue for their sex.

Finally, because black workers not only comprise a larger share of the labor force in the South relative to the rest of the country, their population size makes them an important customer base. Employers focused on profits may have sought to hire black workers to conduct outreach or provide services to black communities (Collins 1997, Grodsky and Pager 2001). So while black-white segregation remained higher in the South in 1980 (King 1992), I expect the relationship between regional location and segregation to decline over time.

To test my expectations, I compare segregation trends in the South where black men and women are a larger share of the labor force than in the remainder of the country ("high representation") with two non-South regions.[16] The latter regions comprise states where black workers' representation is roughly equivalent to their share of the national population ("proportional representation"),[17] and those in which black workers' representation is lower than the national average ("low representation").[18] In 1980 black men were eight percent and in 2000 nine percent of all FTFY men in my data. However, in the "low-representation" states they did not exceed five percent of FTFY men in either decade, while in the South they were 13 and 14 percent respectively of FTFY men in each decade. Similarly, black women comprised 12 and 13 percent of all FTFY women in 1980 and 2000. However, they did not exceed six percent of FTFY women in the "low-representation" states, while they were 18 and 20 percent of FTFY women in 1980 and 2000 in the South.

[16] The representation of black workers is calculated at the level of the West South Central, East South Central and South Atlantic Census divisions, not individual states. These divisions include the high representation states of Florida, Georgia, North and South Carolina, Virginia, West Virginia, Kentucky, Tennessee, Mississippi, Alabama, Arkansas, Louisiana, Texas and Oklahoma.

[17] The representation of black workers is calculated at the level of the East North Central and the Middle Atlantic Census divisions, not individual states. These divisions include the proportional representation states of Ohio, Michigan, Illinois, Indiana, Wisconsin, Pennsylvania, New York and New Jersey.

[18] The representation of black workers is calculated at the level of the Pacific, Mountain West North Central and New England Census divisions, not individual states. These divisions include the Low representation states of Montana, Idaho, Wyoming, Nevada, Utah, Colorado, Arizona New Mexico, North Dakota, South Dakota, Nebraska, Kansas, Missouri, Iowa, Minnesota, Washington, Oregon, California, Alaska, Hawaii, New Hampshire, Maine, Vermont and Connecticut.

Trends in occupational segregation by region. Segregation indices by region for 1980, 2000 and 2009 appear in Table 3.5. In 1980 segregation among women was five points higher and for men two points higher in the South than for black and white workers outside the South. This is consistent with theoretical expectations, the history of Jim Crow segregation and the traditionally greater levels of racial inequality in the South. Between 1980 and 2000, however, segregation levels fell for all regions for both men and women. Segregation dropped by seven points among men in the South, almost eliminating differences between the South and the rest of the country. Women in the South, however, remained more segregated than women outside the South.

Between 2000 and 2009, however, segregation levels in the South were stable for women and declined slightly for men. In the two regions outside the South, however, segregation for men and women increased slightly so that by 2009 regional differences had disappeared for men and had fallen to just three points for women.

Table 3.5. Segregation Indices for Full-Time, Full Year Black and White Same-Sex Workers by Region, 1980, 2000 and 2009.

	Black and White Women			Black and White Men		
	1980	**2000**	**2009**	**1980**	**2000**	**2009**
Aggregate D value	**.29**	**.24**	**.24**	**.34**	**.29**	**.29**
Region						
High representation (South)	.32	.26	.26	.37	.30	.29
Proportional representation	.27	.22	.24	.32	.28	.29
Low representation	.27	.21	.23	.34	.28	.29

Based on 335 occupations from the Integrated Public Use Microdata Series.
2005-2009 data are from the American Community Survey.

DISCUSSION

Despite the broad importance of race in American society for one's life chances generally and for occupational attainment in particular, researchers have paid surprisingly little attention to

trends in occupational segregation by race. It is crucial to monitor the degree to which black and white workers share the same occupations in view of the significance of the kinds of work that people do for creating and maintaining social and economic inequality. Lacking data on trends, scholars cannot theorize the causes of those trends, much less address public policies that might mitigate them.

The results of the above analyses point to several reasons for concern about progress toward racial equality. First, although occupational segregation declined dramatically in the 1960s and 1970s, between1980 and 2000 the decline slowed for women and stopped for men. After 2000 the trend toward occupational integration stalled and, for some subgroups, reversed. As a result, black and white workers remained segregated to a nontrivial degree into the first decade of the 21st century. Pooled data for 2005 to 2009 show that roughly a quarter of black or white workers would have had to move into an occupation in which they were under-represented for both blacks and whites to have had the same occupational distributions. Because I examined segregation for black and white same-sex workers, these results further understate the degree to which black and white workers are segregated in the labor market since black women are even more segregated from white men than from white women, and white women are more segregated from black men than they are from black women (Tomaskovic-Devey and Stainback 2007).

Second, about half of the decline in segregation between1980 and 2000 stemmed from changes in the occupational structure. Relatively integrated occupations such as those in the low-skilled service sector employed a growing share of workers, while more segregated occupations such as blue-collar manufacturing employed a shrinking share. This finding implies that, despite anti-discrimination legislation, only half of the modest integration that occurred between 1980 and 2009 can be attributed to changes in employers' hiring and job assignment

practices. Instead, many employers apparently have continued doing business as usual, using the same—often segregative—hiring and job assignment practices such as hiring through networks (Royster 2003), practices that predictably generate race-related job assignments regardless of employers' intentions (Reskin and McBrier 2000). Of the 24 subgroups that I compared in 2000 and 2009, only four showed continued integration: men and women 55 and older, men in the South, and men with at least a bachelor's degree.

While the above analyses provide ample reason to be concerned about black-white economic inequality, they hold for only the more fortunate and hence tell only part of the story. First, they apply only to employed workers. Black workers, however, tend to be unemployed at twice the rate of white workers even in good economic times (see Mishel et al. 2009). In addition, unemployment rates probably underestimate the black-white gap because they exclude workers who have left the labor force, a group that is disproportionately black. Persons who have left the labor force include discouraged workers as well as those who are incarcerated which, given the disproportionate incarceration rates of black males (Alexander 2010), artificially reduces their unemployment rate, thereby producing exaggerated estimates of their economic progress (Western and Pettit 2005). In short, in addition to race segregation in the occupations workers pursue, black works are disproportionately segregated into the population of the jobless and those out of the labor force.

The current economic climate exacerbates black-white inequality. For example, public sector employment has been particularly important for black workers and for occupational integration specifically, because it is less segregated than the private sector. In 1980 women employed in the public sector had a segregation index of .25, compared to .31 in the private sector; the respective values for men were .28 and .36. By 2000, although segregation levels had

fallen in both the public and private sectors for both sexes, the public sector remained less segregated than the private sector. Women's segregation indices in the public and private sector respectively were .23 and .25; for men the respective numbers were .23 and .30. In 2009, these indices remained stable except that men's index in the public sector dropped by one point. These results emphasize the importance of public sector employment for occupational integration and, more importantly, point to the loss of over a half-million state and local public sector jobs during the current recession (Williams 2011) which is sure to push segregation levels up further.

CHAPTER FOUR
OCCUPATIONAL CHANGE AND CHANGE IN BLACK WORKERS' REPRESENTATION ACROSS OCCUPATIONS

In this chapter I examine the factors that contributed to black men's and women's occupational redistribution between 1980 and 2010. Specifically, to what extent did changes in occupational characteristics such as earnings and rates of unionization account for changes in the representation of black men and women across detailed occupations over this 40-year period? What conditions have contributed to black workers becoming less concentrated in traditionally black occupations?

Historically, many occupations were deemed to be appropriate for some workers but not others based, at least in part, on workers' sex and race. At the turn of the 20th century the vast majority of black women were limited to jobs in either agriculture or domestic service and black men were largely confined to jobs as laborers or agricultural workers (Jones 1985, King 1992). After 1915, however, black men and women began migrating to Northern cities in search of jobs in manufacturing (Foner 2005, Jones 1992, Massey and Denton 1993, Tolnay 2003). As a result, over the second half of the 20th century black men and women made inroads not only into manufacturing but into a range of other occupations including clerical work, management and the professions (Jones 1985, King 1998, Stainback and Tomaskovic-Devey 2009). Thus, while occupations' race and sex composition tends to be stable over time, they can and do shift.

Nonetheless, at the turn of the 21st century black workers remained concentrated in a small number of occupations and were substantially underrepresented or all-but absent from many others. In 2000, for example, while black women were thirteen percent of all women workers employed full-time, year round, they were only two percent of *dental hygienists*, an occupation that is 97 percent female. In contrast, among *nursing aides, orderlies and*

attendants—an occupation that was 88 percent female—black women made up more than one in four workers, twice their share of the female labor force. Among men we see a similar pattern. While black men were nine percent of the full-time, year-round male labor force in 2000, they were a quarter of *garbage collectors and recycling workers*, but just two percent of *airplane pilots and navigators*, both over 90-percent-male occupations. These observations, along with a host of other examples of disproportionality, raise the question "what explains black workers' inroads into some occupations but continued absence or substantial underrepresentation from others over the last three decades?"

CONCEPTUAL FRAMEWORK

In this chapter, I assess the extent to which changes between 1980 and 2010 in occupations account for changes in black men's and women's share of those occupations. In addressing this question I draw on queuing theory. According to queuing theory the matching of workers and occupations involves two queues—a labor queue that reflects employers' ranking of workers and an occupational queue that represents workers' ranking of occupations based on their attractiveness to workers. The limited progress that black workers have made in integrating overwhelmingly white occupations after 1980 described in chapter three suggests that workers' race continues to affect their location in labor queues. Thus, it seems likely that changes in occupations' accessibility and attractiveness to current and prospective white and black workers will be associated with changes in its racial composition.

Regardless of their race, most workers seek occupations with high incomes, benefits and pleasant working conditions (Jencks, Perman and Rainwater 1988, Kalleberg 2011). Which workers are actually employed in these jobs, however, is largely determined by employers' and

hiring agents' rankings of groups of workers in the labor queue and the strength of their preference for certain workers over others whom they have ranked lower in the labor queue. Employers rank workers in labor queues on both workers' qualifications (e.g., educational attainment, experience) and ascribed characteristics such as their race and sex (Lieberson 1980, Reskin 1991, Thurow 1975). Employers' preferences for some groups of workers over equally qualified members of other racial-ethnic groups reflect both differences in the perceived costs of employing different groups of workers as well as the psychic benefits or costs they experience from employing and possibly associating with members of those groups (Ayers 2001).

The Labor Queue

Changes in Employer's Ordering of the Labor Queue

Historically**,** discrimination against blacks, women, and immigrants in hiring and job assignment was not only normative, there were strong proscriptions against hiring black workers at any level where they would be in positions of authority over white workers or come into contact with white customers (Smith 1997, Sundstrom 1994, Tye 2004). Over the last third of the 20th century, however, the passage and enforcement of anti-discrimination legislation increased the potential costs of using ascribed characteristics and thereby reduced employers' reliance on ascribed characteristics when making hiring and job assignment decisions (Skaggs 2009, Sutton and Dobbin 1996). Gradually, **e**mployers' and hiring agents' use of race, sex, and national ancestry in hiring and job assignment declined with changes in the social and legal environment in which hiring and job assignment takes place.

Outlawing discrimination contributed to changes in public attitudes regarding the social acceptability of expressing racial prejudice and racial stereotypes. Thus, both open anti-black

prejudice and support for using race or national ancestry as a basis for excluding workers from jobs declined dramatically (Burstein 1979, Firebaugh and Davis 1988). Changing public attitudes toward discrimination in turn reinforced less discriminatory hiring decisions. This shift in attitudes puts pressure on hiring agents to emphasize credentials and to hire black workers in positions which had been closed to them previously. To the extent that the emphasis on race/ancestry declined and the emphasis on credentials increased, race would have become less important for ordering workers in labor queues and years of schooling more important. As more blacks complete more years of schooling and as race becomes less important in the ordering of the labor queue, some blacks will move ahead of some whites.

After the government began to enforce Title VII of the Civil Rights Act of 1964, black men and women gained greater access to a wider range of occupations which had previously been closed to them (Collins 1997, Darity and Mason 1998). It should be noted, however, that after 1980 the Equal Employment Opportunity Commission (EEOC), the agency charged with investigating discrimination complaints, was weakened by funding cuts and the appointment of conservatives to head the agency (Kelly and Dobbin 1998, Wood 1990). While this may have reduced employers' incentive to comply with Title VII, the EEOC does retain the ability to monitor firms and bring lawsuits in cases where discrimination has been found.

Concentrated near the bottom of employers' labor queues are black and other nonwhite workers as well as many immigrant workers (Lieberson 1980). Tenacious negative stereotypes about blacks, especially black males, as lazy, aggressive, prone to criminal activity and likely to complain about working conditions, however, tend to put them at the very bottom of employers' labor queues (Kennelly 1999, Moss and Tilly 2003, Neckerman and Kirschenman 1991, Wilson 1996). Employers and hiring agents who hold these views are likely to prefer immigrant workers

to native-born black workers. Reinforcing employers' and hiring agents' preferences for immigrant workers is their propensity to hire through the social networks of current employees combined with the chain-migration of immigrant workers.[19] To the extent that nonwhite immigrants and African Americans tend to reside in different parts of the country, employers' relative preferences should not matter; both groups are hired for jobs that are low in the occupational queue. If it is region—and sometimes industry such as agriculture—that primarily determines whether employers select nonwhite immigrants or blacks, then they are in different labor queues, both occupying the position just-below-whites. In this case, there is no reason to expect that growing proportion of immigrant workers, up to a point, to negatively affect blacks' position in the labor queue.

Self-employed workers, however, are not subject to employers' ranking of the labor queue. However, many self-employed workers offer a service or product to a client or customer upon whose ranking they do depend to stay in business. While self-employed workers constitute only four to five percent of workers across the occupations I study between 1980 and 2010, those occupations that involve providing a personal service are likely to disadvantage blacks unless they are located in markets with a black population large enough to maintain a customer base.

Changes in the Composition of the Labor Queue

The composition of the labor queues changed dramatically between 1980 and 2010. Changes in the relative sizes of each group in a labor queue can affect how far down employers have to go to hire enough qualified workers. As Table 4.3 shows, whites' share of the full-time

[19] While immigrants to the U.S. are often concentrated in specific regional labor markets, many occupations also have many of their jobs concentrated in these same labor markets (i.e., farming in California and Texas, technology in Silicon Valley and, increasingly, in places like Florida). Further, once niches are formed, future migrants are guided toward those labor markets.

full-year labor force fell substantially between 1980 and 2010—from almost 83 percent to just 69 percent, substantially changing the composition of the labor queue. Both white women and white men lost job share. White men's share dropped from almost 54.4 percent in 1980 to 43.7 percent in 2010; white women's share fell from 28.3 percent to 25.3 percent. Whites' falling share of the labor force should mean that some employers have to reach farther down the queue to fill jobs, regardless of their preferences. For example, women gained access to some customarily male occupations such as accounting in the 1970s and 1980s because the supply of qualified male workers was inadequate to meet the demand (Reskin and Roos 1990). Thus, I expect that declines in white men's and white women's shares of labor queues should positively affect black men's and women's shares.

While whites made up a shrinking share of the labor queue, immigrants' share grew substantially, from 6.7 percent in 1980 to 16.4 percent in 2010. During this period blacks' share grew only slightly, from 9.4 to 10.6 percent.[20] As immigrants share of the labor queue increased and even outnumbered blacks' share and as they benefit from network hiring, I expect that after some point the proportion of immigrants in an occupation will be negatively related to blacks' share of jobs.

Educational attainment is a primary attribute on which non-discriminating employers rely when ranking the labor queue, and one on which black workers have generally lagged behind white workers. In 1980, for example, 21 percent of white men but only eight percent of black men had at least a bachelor's degree. For women the respective numbers are thirteen and eight percent (U.S. Census Bureau 2012).[21] For this reason black workers' comprised a smaller share

[20] The lack of a larger increase in black men's share of the labor force reflects the "mass incarceration" of black men (Pettit 2012).
[21] In 1980 almost 70 percent of white men and women (69.6 and 68.1 percent, respectively) had at least a high school diploma compared to just over 50 percent (50.8 and 51.5) of black men and women.

of the labor queue for college-level jobs than white workers and therefore were largely concentrated in the labor queues for jobs with lower educational requirements.

Although the proportion of African Americans with at least a college degree has increased since 1980 (17.7 and 21.4 percent of black men and women respectively), so has the share of workers from other racial-ethnic groups with a college degree. Among white men and women, for example, 30.8 and 29.9 percent respectively were college graduates in 2010. Hispanics also saw an increase in rates of college graduation from nine to thirteen percent for men and more than doubling from six to almost 15 percent for women. To the extent that black workers' levels of educational attainment have continued to trail those of white workers, I expect increased educational attainment among an occupation's incumbents to be associated with a decline in the employment of black workers and declines in the educational attainment of occupational incumbents should be associated with the increased representation of black workers.

The Occupational Queue

Workers' ranking of occupations can change over time due to social, economic and technological shifts that affect the organization of work and hence the quality of jobs within occupations. These changes include increasing globalization, automation and other forms of "creative destruction" (Schumpeter 1942) which alters the conditions of work in some occupations, creates whole new occupations and eliminates others.

Over the last three decades the organization of work has increasingly been shaped by global competition, global production markets and an increased emphasis on profit maximization. At the same time regulation has declined. These changes have allowed American

and multinational corporations to outsource jobs, especially manufacturing jobs, to low-wage countries (Collins 1997, Wilson 1996) while service occupations have seen considerable growth in the United States. While many service occupations are attractive and provide job security, high wages/salaries and health benefits, the majority are not and do not provide job security, good pay or benefits. Further, employers are increasingly reducing workers' hours, making greater use of temporary workers and outsourcing major functions to independent contractors (Ehrenreich 2001, Kalleberg 2011, Tilly 1996). These changes have meant that the share of jobs in the job queue that are "good jobs" has shrunk, while the labor queue has become larger and more diverse.

To the extent that employers have any preference for white workers over their same-sex black counterparts, a queuing perspective implies that black workers' representation should have fallen in occupations that have become more attractive, rising in the occupational queue and increased in occupations that became less attractive to workers.[22] As noted in the previous chapter, occupational attractiveness is based on the occupation's wages, likelihood of providing pensions, unemployment levels and the share of workers employed in non-standard work arrangements (e.g., part-time, seasonal).

Unionization rates also indicate occupational attractiveness because unionization is associated with higher wages and better benefits (Mishel 2012, Mishel and Walters 2003, Rosenfeld 2014). While historically unions served a gatekeeper function that limited the access of black workers to specific occupations (Tye 2004), today black workers are more likely than white workers to be represented by unions (Marable and Wilson 2006). This reflects, at least in

[22] This assumes that employers lack access to other low-status groups such as immigrants whose positions in the labor queue relative to blacks depend in part on their share of the local population and the kind of work involved. My analyses control for the presence of immigrants who may compete with blacks for jobs whites eschew.

part, the fact that black workers are disproportionately employed in the public sector which has higher levels of unionization than the private sector.

Changes in the share of an occupation's jobs located in government should also affect black workers' access. Historically, the public sector has provided African American workers, especially those with college educations, with better employment opportunities than those available in the private sector (Durr and Logan 1997, Waldinger 1996, Williams 2011). As a result, black workers are disproportionately employed in local, state and federal jobs. In 1980, for example, 22 percent of black women and 25 percent of black men were employed in the public sector which remains an employment niche for African American workers, with one in five black workers working in government as late as 2009 (Williams 2011). Thus, increases in the share of occupations' jobs that are in the public sector should lead to increased employment by both black women and men.

Of course, the more self-employed workers in an occupation, the less important employers' preferences should be for ranking the labor queue and more important the preferences of workers' clientele. Occupations vary in the ease with which workers can become self-employed. For example, in 2000 almost one-third of *barbers* were self-employed while no *telephone operators* were. While black men made up 30 percent of *barbers* in that decade, both the needed levels of educational attainment and start-up capital requirements of occupational incumbents were relatively low. Many professional occupations with high levels of self-employment require extensive education, training and/or start-up resources (e.g., *dentists, optometrists, podiatrists*) and, as a result, are less likely to be accessible to blacks than whites. In 2000 for example, black men and women combined constituted only four percent of *dentists*, two percent of *optometrists* and seven percent of *podiatrists*. Thus, I expect a negative

relationship between the share of workers in an occupation that are self-employed and changes in the representation of black workers.[23]

Occupations more amenable to self-employment also tend to employ fewer workers in each establishment. For example, the above mentioned *dentists* and *barbers* as well as *funeral directors* and *veterinarians* tend to work in smaller firms than do *personnel and human resource workers* or *records clerks*. The increased demand for labor in larger firms, however, increases the likelihood of employing black workers due, at least in part, to the greater likelihood that larger firms have more formalized employment practices which tend to increase the employment of black workers (Dobbin, Sutton, Meyer and Scott 1993, Knoke et al. 1996, Reskin et al. 1999).

Further, large firms are more likely to be targeted for legal action if black workers are underrepresented or excluded from specific jobs which give them a stronger incentive to employ black workers (Collins1997, Marshall 1974). The 1964 Civil Rights Act that outlawed employment discrimination, for example, applies only to firms with at least 15 employees. Private-sector firms with fewer than 100 workers are not required to report the race and sex composition of broad occupational groups to the EEOC (Tomaskovic-Devey and Stainback 2005). Thus, occupations with an increased share of their workers in large firms should also show an increase the share of workers who are black.

Finally, black workers' access to an occupation depends on the location of its jobs relative to where black workers live. In 2000, for example, forty-seven percent of African Americans were living in ten southern states (McKinnon 2001). In addition, from 1980 to 2010 many northern-born blacks were moving to the South and many southern-born blacks who had migrated to northern states began to return to the South (Tolnay 2003). Thus, occupations whose

[23] Black workers may be equally or more likely than white workers to be self-employed in occupations that allow working out of their homes such as hairdressing, home repairs and car repair.

jobs became more concentrated in the South should have increased the employment of black workers. Boeing, for example, has moved many of its production jobs from Washington State to South Carolina and has made plans to further expand on their production operations there (Smith 2013, Wilhelm 2013). Therefore, black workers should make up a larger share of Boeing's labor queue in South Carolina than in Seattle and black workers' representation in aircraft manufacturing jobs should increase in the future.

Black workers are also unevenly distributed across metropolitan statistical areas. Over the course of the 20th century black workers increasingly came to reside in central cities at the same time that jobs began exiting these central cities for the suburbs surrounding the central cities (Jargowsky 1997, Massey and Denton 1993, Wilson 1996). This resulted in a spatial mismatch that effectively limited black workers' access to these jobs (Mouw 2000, Wilson 1996). Therefore, occupations with an increased share of their jobs in central cities should also show an increase in the representation of black workers while occupations whose jobs were increasingly in suburban and/or rural areas outside of central cities should have had a decline in African American representation.

DATA AND METHODS

Data

To assess the relationship between occupational change and shifts in the representation of black men and women I utilize data from the Integrated Public Use Microdata Series (IPUMS) from the Minnesota Population Center (Ruggles et al. 2010). I use data from the five-percent sample for 1980 through 2000 and I use the American Community Survey for 2010. However, in order to expand my assessment of occupational change, I draw on the Current Population Survey to supplement the data for all decades.[24] For each data source the IPUMS provide a consistent 3-digit detailed occupation across these four decades. Because the Bureau of the Census used different occupational coding schemes in 1990 and 2000, the IPUMS data provides an "occ1990" variable for each data source by recoding the data in each decade according to the 1990 coding scheme.

The 1990 standardized coding scheme provides data for 383 occupations including 48 occupations that contained no observations in either 1980 or 2000. To ensure that I am comparing a consistent set of occupations over time, I drop these 48 occupations. In addition, there are four occupations – judges, legislators, postmasters, and layout workers — that lack data for most of the variables that capture factors that theoretically affect changes in black and white workers' access to occupations, so I drop these as well. My final dataset contains 331 occupations. In 1980 no occupations had data for the union, pension or firm size variables. I estimated these using the multiple imputation function in Stata.

[24] The variables for union coverage, percent of workers with pensions, and the number of the workers' employed by the employees' firms are calculated from the Current Population Survey (CPS).

Variables and Measures

Dependent Variables

The analyses below seek to understand how changes in occupations' characteristics (earnings, unionization rates) are associated with changes in the representation of black men (***Δ%bmale)*** and black women ***(Δ%bfem)*** among *all* occupational incumbents, both male and female, between 1980 and 2010. Thus, the dependent variables are change scores for the representation of black men and black women.

Changes in the Composition of the Labor Queue

A key factor in understanding changes in the representation of black workers across occupations is the size of all other groups in the labor queue. Because educational attainment is often a threshold measure of workers' qualifications, I include changes in the median educational attainment of occupational incumbents (***Δmdedu***) to capture this.

There are also reasons to expect that changes in the sex composition of an occupation will affect its racial composition. Occupations with large declines in the share of workers who are male, for example, may not only increase the share of workers who are female, but may particularly raise the representation of black females. The occupation of *managers in education and related fields*, for example, was 61 percent male in 1980, but by 2010 it was 64 percent female. During this period, black women's representation increased from five percent to just over nine percent of all workers in the occupation, consistent with their growing share of the labor force. I expect the effect of changes in the other sex's share of an occupation to vary by their sex. For example, I expect increases in the proportion of black men to enhance black women's share of an occupation, but I expect increases in the proportion of white men to reduce

black women's access to occupations. The same reasoning holds for my expectations regarding the effects of changes in black and white women's occupational shares on black men's subsequent occupational representation. For all four of these sex-race composition independent variables I further expect curvilinear effects on my dependent variables. Thus, I expect an increase in black women's share of an occupation to enhance black men's access to that occupation until black women's increased share becomes quite large, after which a growing share of black women should reduce black men's access. Thus, my model includes change in both the percentage of workers of the other sex (***Δ%bmale, Δ%wmale, Δ%bfem, Δ%wfem)*** and the percentage squared (***Δ%bmale^2, Δ%wmale^2, Δ%bfem^2, Δ%wfem^2)***.

The labor force also became much more ethnically diverse between 1980 and 2010. In 1980 African Americans were a much larger share of the labor force than either native-born Latino/Latinas or foreign born workers. By 2010, this situation had shifted as immigrants and Latino workers comprised a larger share of the labor market than did black workers. As immigrant streams to the U.S. increased, new immigrants followed earlier flows of compatriots, utilizing these social networks to find employment. The practical result was the formation of occupational niches in areas with heavy immigrant concentrations which limited occupational access to members of their own ethnic group (Waldinger 1996). Thus, in occupations in which immigrant workers were under-represented or represented proportionately to their share of the labor force, black workers' representation should not have changed. To model this I include a measure of change in the share of workers that were born outside the U.S. And because of high levels of occupational sex segregation, I include only same-sex immigrant workers (***Δ% immigrantmale, Δ% immigrantfemale***). I do expect, however, that as immigrant workers share of an occupation exceeds their representation in the labor force overall, as the occupation

becomes an occupational niche, black workers' representation should decline. Thus, I also include a squared term to capture this effect ***(Δ% immigrantmale^2, Δ% immigrantfem^2)***. Because the share of an occupation's workers that were Latino was highly correlated with the share born outside the U.S., I do not include a term for Latino workers.[25]

Changes in the Ranking and Sizes of the Occupational Queues

From a queuing perspective, occupations with increased unemployment, part-time employment, and low-wages should have increased the share of workers who were African American. Occupations which increased the share of workers with pensions and with high earnings should have employed fewer black workers. To capture changes in the attractiveness of the occupation, I include the share of workers who earned less than $10,000 in 2000 dollars (***Δ%lowwage***), had earnings high enough to be top-coded by the Bureau of the Census (***Δ%highincome***), the percentage of workers that were unemployed ***(Δ%unemployed***), worked part-time (***Δ%parttime***), were covered by a union (***Δ%unioncov)***, or had a pension (***Δ%pension***).

Change in the numbers of workers employed in an occupation (***Δoccsize)*** should be positively associated with the representation of black workers because it should signal reduced competition. Similarly, change in the average number of workers employed in the firm that occupational incumbents work in (***Δfirmsize)*** should be positively associated with the employment of black workers. That is, occupations with increased numbers of workers employed in the typical firm should employ more black workers because they tend to have more formalized recruitment and hiring processes. And, as the percent of an occupation's jobs located in the public sector (***Δ%public***) increased and the percent self-employed (***Δ%slfempld***) declined, the occupation should have employed more black workers.

[25] Models including only the share of workers who were Latino produced similar results to my model which includes only the share of workers that were immigrants.

Black workers are disproportionately located in the southern United States and they continued to increase their presence in the South between 1980 and 2010. To take into account this trend, I computed dummy variables for the percentage of jobs located outside the southern United States with the South as the omitted category (***Δregion)***.[26] Occupations with an increase in the share of its jobs located in the South should employ more black workers while occupations that increased the share of their jobs outside the South should have seen a decline in the representation of black men and women. Black workers also disproportionately resided in urban areas so I include a dummy variable capturing change in the proportion of an occupation's workers employed in the suburbs (***Δ%suburb***) to compare to urban areas**,** the reference category.

Appendix A shows the means and standard deviation for all variables included in the analysis for each decade.

Fixed Effects Regression

To test my expectation about the factors that, according to queuing theory, are implicated in the changing black-white composition of occupations, I use fixed effects regression. In contrast to Ordinary Least Squares (OLS) regression which would analyze the variation between occupations, Fixed Effects regression uses the within-occupation variation to determine the relationship between changes in my independent variables and changes in the employment of black men and women. This difference is important because it allows me to control for stable occupational characteristics, effectively addressing the effects of omitted variable bias. Fixed effects regression is equivalent to including a dummy variable for each occupation as well as a dummy variable for each of the four decades 1980, 1990, 2000 and 2010 in the analyses.

[26] I estimated the impact of each region of the country individually – the west, Midwest and northeast with the south as the omitted category. An increase in jobs in each region resulted in significantly fewer black workers employed in the occupation so I combined all non-south regions.

Because I posit the direction of the effect of occupational characteristics, the significant tests for the regression are one-tailed tests.

The model for black women is:

$$\Delta\%Bfem = a_i + \beta_1\Delta mdedu_{it} + \beta_2\Delta\%bmale_{it} + \beta_3\Delta\%bmale^2_{it} + \beta_4\Delta\%wmale_{it} + \beta_5\Delta\%wmale^2_{it}\ \beta_6\Delta\%immigrantfem_{it} + \beta_7\Delta\%immigrantfem^2_{it}\ \beta_8\Delta\%lowwage_{it} + \beta_9\Delta\%highincome_{it} + \beta_{10}\Delta\%unemployed_{it} + \beta_{11}\Delta\%unioncov_{it} + \beta_{12}\Delta\%pension_{it} + \beta_{13}\Delta\%parttime_{it} + \beta_{14}\Delta occsize_{it} + \beta_{15}\Delta firmsize_{it} + \beta_{16}\Delta\%public_{it} + \beta_{17}\Delta\%slfempld_{it} + \beta_{18}\Delta south_{it} + \beta_{19}\Delta suburb_{it} + \varepsilon_{it},$$

a_i is the fixed effect for the occupation; ε_{it} is the error term.

Because of high levels of occupational sex segregation I conduct analyses separately for men and women. This allows me to assess the degree to which occupations' characteristics similarly effect the representation of black men and women. This is important given the paucity of research that considers the intersection of race and sex (McCall 2001).

RESULTS

Both black women's and black men's representation in the occupations in my analyses grew slightly between 1980 and 2010, with black women's share increasing by almost one percentage point and black men's increasing by almost one-half percentage point (see Appendix A). More importantly, between 1980 and 2010 their distribution across occupations showed moderate shifts. Table 4.1 shows the ten occupations employing the largest numbers of black men and black women and it indicates that the changes in black workers' occupational distributions did not necessarily result in upward occupational mobility.

Table 4.1. Occupations Employing the Largest Share of Black Men and Women by Decade

Proportion of ALL Black Men in the Occupation (1980)		Proportion of ALL Black Women in the Occupation (1980)	
Truck, delivery, and tractor drivers	7.1%	Nursing aides, orderlies and attendants	3.8%
Janitors	6.2%	Secretaries	2.4%
Military	4.8%	Primary school teachers	2.5%
Machine operators, n.e.c.	4.5%	General office clerks	2.3%
Laborers outside construction	3.9%	Housekeepers, maids, lodging cleaners	2.4%
Construction laborers	2.9%	Cooks, variously defined	2.9%
Assemblers of electrical equipment	2.6%	Cashiers	2.1%
Managers and administrators, n.e.c.	2.5%	Assemblers of electrical equipment	2.8%
Cooks, variously defined	2.1%	Janitors	4.6%
Production supervisor	1.9%	Machine operators, n.e.c.	3.6%
Total	**38.5%**	**Total**	**29.4%**

Proportion of ALL Black Men in the Occupation (1990)		Proportion of ALL Black Women in the Occupation (1990)	
Truck, delivery, and tractor drivers	7.0%	Nursing aides, orderlies and attendants	4.3%
Janitors	5.5%	Cashiers	3.8%
Military	4.2%	Secretaries	2.5%
Cooks, variously defined	3.8%	Primary school teachers	2.6%
Laborers outside cons	2.7%	Cooks, variously defined	3.6%
Machine operators, n.e.c.	2.7%	Salespersons, n.e.c.	2.6%
Construction laborers	2.6%	Janitors	4.1%
Assemblers of electrical equipment	2.5%	General office clerks	1.7%
Managers and administrators n.e.c.	2.3%	Housekeepers, maids, lodging cleaners	1.7%
Salespersons, n.e.c.	2.3%	Registered nurses	1.3%
Total	**35.6%**	**Total**	**28.3%**

Proportion of ALL Black Men in the Occupation (2000)		Proportion of ALL Black Women in the Occupation (2000)	
Truck, delivery, and tractor drivers	7.0%	Nursing aides, orderlies and attendants	7.1%
Laborers outside cons	4.3%	Cashiers	5.5%
Janitors	3.7%	Secretaries	4.1%
Cooks, variously defined	3.7%	Customer service reps	3.6%
Military	2.2%	Primary school teachers	2.9%
Machine operators, n.	2.2%	Cooks, variously defined	2.7%
Stock and inventory c	2.2%	Retail sales clerks	2.5%
Retail sales clerks	2.1%	Housekeepers, maids, lodging cleaners	2.5%
Guards, watchmen, doorkeepers	2.0%	Registered nurses	2.4%
Construction laborers	2.0%	General office clerks	2.3%
Total	**31.2%**	**Total**	**35.6%**

Table 4.1 continued

Proportion of ALL Black Men in the Occupation (2010)		Proportion of ALL Black Women in the Occupation (2010)	
Truck, delivery, and tractor drivers	6.7%	Nursing aides, orderlies and attendants	9.2%
Laborers outside construction	4.3%	Cashiers	6.0%
Cooks, variously defined	4.1%	Secretaries	3.7%
Janitors	4.0%	Customer service reps	3.6%
Stock and inventory clerks	2.7%	Primary school teachers	2.8%
Guards, watchmen, doorkeepers	2.6%	Registered nurses	2.7%
Managers and administrators n.e.c.	2.5%	Retail sales clerks	2.7%
Retail sales clerks	2.5%	Cooks, variously defined	2.5%
Cashiers	2.0%	Teachers , n.e.c.	2.2%
Supervisors and proprietors of sales jobs	1.9%	Housekeepers, maids, lodging cleaners	2.1%
Total	**33.2%**	**Total**	**37.4%**

Table 4.1 shows that black women became increasingly concentrated in a small number of occupations with relatively low pay and poor working conditions. In 1980 29.4 percent of black women worked in these top ten occupations but by 2010 more than 37 percent did. In 1980 no occupation employed more than five percent of all black women, by 2010 two occupations—*nursing aides, orderlies and attendants* as well as *cashiers* did. Further, *nursing aides, orderlies and attendants* remained the top occupation for black women. The percentage of black women working in this occupation more than doubled over this 30-year period with almost one in ten black women worked as *nursing aides, orderlies and attendants* by 2010. More surprising however, six of the top ten occupations for black women in 1980 remained in the top ten by 2010.[27]

The top ten occupations for black men are also shown in Table 4.1. In contrast to black women, they become less concentrated over time, although these occupations still employed

[27] Two of these occupations, secretaries and primary school teachers, also saw increases in the employment of black women over this thirty-year period by 1.3 and .3 percentage points respectively. In 1990 registered nurses became one of the top-ten occupations employing black women, and black women's representation increased in this occupation by 1.4 percentage points between 1990 and 2010.

more than one in three black men in each decade (from 38.5% in 1980 to 33.2% in 2010). Four of the top ten occupations for black men remained in the top ten in each succeeding decade. While six of the top ten occupations for black men dropped from the top ten, the occupations that took their place (e.g., *stock and inventory clerks*; *guards*, *watchmen and doorkeepers*) are also low-paying occupations.

While the ten occupations employing the greatest number of black men and women paint a bleak picture of black workers' occupational outcomes, they do not represent all black workers. Chapter 4 showed that black workers occupational distributions did indeed change in substantial ways since 1980. The question driving this analysis is the extent to which changing occupational characteristics account for the observed changes in black men's and women's representation across occupations. The fixed effects regression analyses shown in Table 4.2 test the hypothesized relationships between changing occupational characteristics and the changing representation of black women and men.

Table 4.2. Fixed Effects Regression of the Changing Representation of Black Women and Men across Detailed Occupations between 1980 and 2010

Change in Percent Black Female Incumbents			Change in Percent Black Male Incumbents		
Panel A	**Coef.**	**One-tailed P>t**	**Panel B**	**Coef.**	**One-tailed P>t**
Changes in the Labor Queue					
Δ median education	-0.242	0.001	Δ median education	-0.113	0.119
Δ % black males	0.464	0.000	Δ % black females	0.420	0.000
Δ % black male squared	-0.014	0.000	Δ % black female squared	-0.014	0.000
Δ % white male	-0.291	0.000	Δ % white female	-0.131	0.000
Δ %white male squared	0.002	0.000	Δ %white female squared	0.000	0.068
Δ % female immigrants	0.024	0.080	Δ % male immigrants	0.036	0.047
Δ % female immigrants squared	-0.002	0.000	Δ % male immigrants squared	-0.002	0.000
Changes in the Occupational Queue					
Δ % low-wage	-0.027	0.019	Δ % low-wage	0.037	0.010
Δ % high income	0.101	0.010	Δ % high income	0.011	0.413
Δ % unemployed	0.071	0.003	Δ % unemployed	0.068	0.012
Δ% covered by union	-0.004	0.136	Δ% covered by union	0.004	0.175
Δ % with pensions	0.000	0.474	Δ % with pensions	-0.004	0.18
Δ % part-time	-0.009	0.277	Δ % part-time	-0.034	0.026
Δ occupation Size	0.385	0.007	Δ occupation Size	0.060	0.373
Δ in mean firm size	0.198	0.035	Δ in mean firm size	0.039	0.366
Δ % public sector	0.051	0.000	Δ % public sector	0.019	0.005
Δ % self employed	0.011	0.258	Δ % self employed	-0.068	0.001
Δ % in the south	0.038	0.002	Δ % in the south	0.027	0.038
Δ % suburban	0.004	0.093	Δ % suburban	0.016	0.000

Based on 331 occupations from the Integrated Public Use Microdata series (IPUMs).

Changing Composition of the Labor Queue and Black Workers' Representation

I begin by considering variables that capture changes in the composition of workers within the labor queue. Because educational credentials set minimum standards in many occupations, thereby limiting the pool of qualified workers, I expect a negative relationship between educational attainment and the representation of black men and women. Table 4.2 shows increases in the educational attainment of workers in an occupation were associated with a

decline in the employment of black women. For black men, increases in educational levels in an occupation did not have a statistically significant effect.

A second compositional change that I expected to affect black workers' share of the jobs in an occupation is the growth in alternative supplies of workers whom employers rank below whites in the labor queue. The group most likely to compete with black workers is immigrants who increased their share in the labor force substantially between 1980 and 2010 (Singer 2012). I hypothesized a non-linear relationship between changes in the share of an occupation's workers that were same-sex immigrant workers and the share that were black with no effect of same-sex immigrant workers in an occupation when change in their representation was close to zero. My findings were partially consistent with this expectation. In occupations with change close to zero, a one percentage-point increase in the share of the occupation's male workers that were immigrants was associated with almost four-tenths of a percentage point increase in the representation of black men.

For both, black men and black women, there is a significant curvilinear relationship between the change in share of workers that were immigrants and change in same-sex black workers' occupational access. For women, an increase in the share of female workers that were foreign born was not associated with an increase in the employment of black women until immigrant women reached seven percent of all female occupational incumbents after which further increases in the share of all women that were immigrants were associated with small declines in the representation of black women. Among men, as male immigrant's representation increased, black men's representation also increased until male immigrant's share of the occupation reached nine percent at which point further increases in the percentage of male

incumbents who were foreign born was associated with a decline in black men's share of all workers.

The share of an occupation's workers that was filled by members of the other sex was also an important factor in the ordering of the labor queue. As noted, to take into account the likelihood that the effects of changes in the share of white men and changes in the share of black men might differ, I include separate measures for each. My results show that the effect of changes in the share of workers of the other sex depends on the race of the workers as well. In both, the analysis for black women and for black men, increases in the proportion of other-sex whites reduces black women's and men's share of jobs. Both analyses also show that increases in the proportion of other-sex, same-race workers increased the employment of black men and women. As black men's access to an occupation increased so did black women's until black men constituted roughly 16 percent of all workers at which point further increases in black male employment were associated with a decline in the representation of black women. Importantly, however, black men constitute more than 16 percent of workers in very few occupations. One such occupation is *baggage porters* of whom black men were almost one in three workers in 1980. Over the next three decades, black men's share of all *baggage porters* declined, and black women made small gains.

The relationship between changes in the representation of white males and black women's share thirty years later suggests the opposite dynamic. Until the white male share of an occupation exceeded 70 percent, a decline in white men's share of jobs in an occupation was associated with an increase for black women. Because the workforce has become more diverse, however, white males' share of workers declined in most occupations. In those occupations that had been dominated by white males in 1980, a decline in the share of workers who were white

males resulted in an increase in the representation of black women, black men and white women. For example, white males were over 90 percent of *railroad conductors and yard masters* in 1980, but they were only 76 percent by 2000. Because the occupation employed roughly the same number of workers in 1980 and 2000, black men and women and white women were able to make inroads into the occupation.

My results for changes in black male representation also show effects of workers' sex that vary depending on their race. As black women gained access to an occupation, black men's representation also increased indicating the fall of racial barriers regardless of workers' sex (as shown in panel B of Table 4.2). However, when black women's representation increased beyond 15 percent of all workers in the occupation, the positive relationship with black men's representation became negative. While this relationship is statistically reliable, it should be noted that in 1980 black women exceeded 15 percent of all workers in only eight occupations. In two of these—*Nursing aides, orderlies and attendants* and *Licensed practical nurse*—black women's representation actually increased by almost five percentage points by 2010 while declining in the remaining six.

In contrast, the share of an occupation's workers who are white females is negatively related to the percentage of black men. A one percentage-point increase in the employment of white females is associated with an average decline in black men's employment in an occupation of just thirteen-hundredths of a percent. This effect does not depend on the size of white females' share of occupational workers as the non-significant coefficient for the white female-squared term indicates. This very likely reflects the fact that those occupations with the highest share of white females are also female-typed occupations. In 2000, for example, 78 percent of

secretaries, 75 percent of *registered nurses* and 74 percent of *dental assistants* were white females. Each of these occupations, however, was over 90 percent female in 1980.

Changes in Ordering the Occupational Queue and Black Workers' Representation

As occupations' attractiveness changes relative to other possible occupational options, the representation of workers from preferred groups will change as well. Because black men are ranked lower in the labor queue than white men and black women are ranked even lower in the labor queue (King 1993), black men and women should make the greatest inroads into occupations that have become less attractive to whites. Thus, changes in the share of an occupation's workers who are unemployed, earn low-wages, and work part-time should have been negatively associated with whites' representation in those occupations, thereby making room for more black workers

The results in Table 4.2 show that a one percentage-point increase in an occupation's unemployment rate was associated with about seven-tenths of a percent increase in the employment of both black women and men. *Cashiers*, for example, experienced higher unemployment rates in each decade, and the representation of black workers, especially black women, also increased. Similarly, many construction occupations such as *cement and concrete workers*, *construction laborers* and *construction trades, n.e.c.* saw large drops in their unemployment rates and also in the employment of black men. Increased shares of workers who were low-wage—workers earning $10,000 or less in 2000 dollars—was also positively associated with the employment of black men, but not black women.

Changes in the share of jobs in the public sector were significant and positive for both, black men and women. The effect is somewhat greater for women—a one percentage point

increase in the share of an occupation's jobs in local, state and federal government is associated with a one-half percentage point increase in the employment of black women but only two-tenths of a percentage point increase in the employment of black men. So, for example, a nine percentage-point decline in public sector employment among dietitians and nutritionist was coupled with a five percentage-point decline in the employment of black women. Similarly, black men's share of garbage and recyclable materials workers fell by eight percentage points, while the share of these jobs in the public sector declined by 25 percentage points.

While changes in rates of occupational self-employment were not statistically reliable for black women, they were negatively related to the employment of black men. As the share of occupational incumbents that were self-employed increased by one percentage point, black men's employment in that occupation declined by almost seven-tenths of a percentage point. Based on one-tailed tests of significance there were no statistically significant effects of change in high wages, pensions, part-time employment or covered by unions on the share of black men or women, net of the other variables in the analysis.

Changes in Occupational Composition and Black Workers' Representation

As I expected, occupational growth was positively associated with the employment of black women, as Table 4.2 shows. For each increase of 1,000 workers, black women gain, on average, 38 jobs in that occupation. However, the effect of occupational growth on black men's occupational access was not great enough to be statistically reliable. Similarly, occupations whose workforce increasingly worked in large firms tended to increase their employment of black women. And again, the effect of firm growth on black men's employment was not large enough to reach statistical significance. A review of my data indicates that in most occupations,

the average firm size was relatively stable or declined over time. *Respiratory therapy*, an occupation that was over 60 percent female in three of the four decades, was one of the few occupations in which firm size grew and black women enjoyed the benefit with increased employment. Similarly *dental laboratory and medical appliance technicians*, an occupation that was over 70 percent female by 2000, showed one of the largest increases in average firm size and substantial increases in black female representation.

As more of an occupation's jobs moved to the South where black workers would comprise a greater share of employers' labor queues, I expected that it would employ more black workers. Table 4.2 bears this out. The percentage of occupation's jobs located in the South increased in each decade and as the share of an occupation's jobs located in the South increased, black workers' employment in that occupation also increased. For example, black women's representation among *financial managers* increased four percentage points while the share of jobs in this occupation that were located in the South grew from 28 percent to 34 percent. Similarly with *Personnel, HR, training and labor relations* which saw an increase of just over four percentage points from 1980 to 2010 while the share of jobs in this occupation in the South increased by just under five percentage points over the same period.

Table 4.2 shows the same pattern for black men. In 1980 26 percent of *supervisors of guards* were located in the South; this increased to almost 40 percent in 2010. Over this same period, black men's representation in this occupation rose from eleven percent to 14 percent. *Guards, watchmen and doorkeepers* also saw a rise in its share of jobs in the South, an increase of almost five percentage points and black men's employment in this occupation increased by just over five percentage points. Thus, all other things being equal, black workers gain greater access to jobs where black workers are a larger share of the labor queue.

DISCUSSION

Between 1980 and 2010 the occupational distributions of black men and women showed substantial changes. Over this same period of time, the labor force also changed as white males' share of the labor force declined and white women, black women and men, immigrants and other groups of workers increased their share of the labor market. The US economy and the occupations that comprise it also underwent substantial changes in earnings, unionization rates, and the provision of pensions and the use of part-time and other non-standard forms of work. In this chapter I examined the relationships between changes in the size and composition of the labor force, the size and composition of the occupational structure and black men's and women's distributions across occupation.

My results indicate that despite the changes in the occupational distributions of black men and women, after 1980 there were very few real improvements in the occupational standing of these workers. More importantly, my results show that race continued to be an important basis for the ordering the labor queue. For example, there is no reason to believe that workers would choose occupations with increasing levels of unemployment. My analyses, however, show that as unemployment in an occupation increased so did the employment of black men and women. Occupations with increasing shares of their jobs in the South and in the public sector however, also showed increased access to black workers. In the South, black workers comprise a disproportionate share of the workforce, and thus of employers' labor queues, limiting the ability of employers to exclude them from jobs for which they are qualified. In the public sector, legal constraints on discrimination and the greater formalization of hiring practices reduce the effects of race on hiring and job assignment.

My results also show that when occupations become accessible to either black men or black women, members of the other sex also make gains in that occupation. While this pattern reverses as black men's and women's representation increases beyond their proportionate representation in the labor force, the reversal reflects high levels of occupational sex segregation rather than a racial barrier. This interpretation is supported by the regression results showing that at low levels of representation, increases in same-sex immigrant workers in an occupation are also associated with an increase in the representation of black men and women. This indicates that once non-white groups gain access to an occupation, the importance of race in the ordering of the labor queue declines.

Further, and perhaps more important, I show that the effect of race differs for black workers depending on their sex. Occupations in which the share of low-wage jobs increased employed fewer black women while those occupations in which the share of high-wage jobs increased employed more black women. For black men, however, increases in low-wage jobs were positively associated with their employment, but there was no relationship with changes in high wage jobs. Further, black women—but not black men—benefitted from occupational growth. Occupations whose workforce grew or in which the typical firm employed an increasing number of workers provided greater employment opportunities for black women who saw their employment in these occupations increase. Black men, however, did not enjoy increased employment either with expanding occupations or expanding firm sizes.

Finally, the analyses in this chapter provide support for my expectation that some occupations can be niches for specific groups of workers, here, immigrant workers. As immigrant workers gained access to an occupation, black same-sex workers' employment in that occupation also increased. However, once the share of workers in an occupation that were

foreign born exceeds a given level of representation, black men's and women's share of jobs fell in that occupation.

CHAPTER FIVE
CONCLUSIONS AND DISCUSSION

Occupational segregation represents one of the most important mechanisms by which economic and social inequalities are created, maintained and justified (Lieberson 1980, Vallas 2003). This includes inequalities in pay, promotion, prestige and authority. Occupational segregation also restricts interpersonal interactions across the boundaries of race and sex (Vallas 2003), boundaries that both reinforce differences between social groups and make these differences appear natural (Reskin 1988, Ridgeway 1991). Understanding the processes which lead to or undermine occupational segregation allows us to examine the efficacy of policies aimed at increasing economic equality and provides a compelling reason to study trends in occupational segregation.

It is primarily through occupations that we distribute resources such as income, prestige, authority and even health care (Baron and Newman 1990, Bielby and Baron 1986, Kmec 2003, Reskin 1988). Differences in black and white workers' occupational distributions lead to differences between blacks and whites in access to basic social and economic resources. Given high levels of occupational segregation, black workers earn, on average, less than white workers and have less access to perquisites such as respect and authority. Because black workers tend to work in both occupations and establishments in which black workers are over-represented, segregation allows employers to give black and white workers different wage and benefit packages. Kmec (2003), for instance, shows that workers in jobs where the majority of their co-workers are black or Hispanic had lower wages than workers in similar jobs with mostly white co-workers. Because these inequalities tend to persist over time, processes of cumulative disadvantage translate them into even more fundamental and durable inequalities such as the

ability to buy a home, generate wealth and otherwise provide for short- and long-term economic security (Pattillo-McCoy 1999, Shapiro 2004, Tilly 1998).

Occupational segregation reinforces the inequalities generated by the high levels of racial residential segregation in the U.S. (Charles 2003, Massey and Denton 1993, Pattillo-McCoy 1999), increasing the ease with which resources can be channeled toward one group and away from others (Jargowsky 1997, Massey 2007). Residential segregation generates inequalities in resources critical for occupational attainment including differences in educational outcomes, job referral networks and direct access to jobs (Jargowsky 1997, Royster 2003, Wilson 1999). Occupational segregation actually reinforces these inequalities by further limiting access to social networks and job-related information embedded in those networks (McGuire 2000, Royster 2003). The widespread nature of these patterns makes them appear natural, or at least explicable, as stemming from either different preferences of black and white workers or the result of racial differences in skills and credentials.

Even when black and white workers are in the same firms black workers are overrepresented in occupations that limit access to social contacts and information important for occupational mobility. Occupational segregation does this in part by limiting who workers are likely to come into contact with and by creating clear boundaries between the roles of incumbents when they do come into contact with other workers. Occupational roles may possess scripts for interactions between incumbents of different positions such as between hospital administrators and nursing aides or orderlies. The status differences between these occupations preclude interactions that might lead to the development of professional relationships, mentoring or the sharing of information about job opportunities. This is of special importance because of the crucial role of

social networks in accessing not only employment generally but good jobs in particular (Braddock and McPartland 1987, Reskin and McBrier 2000, Royster 2003).

Finally, occupations differ in the extent to which they have built-in career ladders that promote occupational mobility. According to King (1992), one's occupation is more important than wages or income for predicting future outcomes because occupations affect future opportunities through chances for advancement. For example, entry-level sales workers and purchasing agents have a clear path of mobility within the company into management positions. Once these workers are chosen as trainees, they are provided with an even more direct and expected route of upward mobility. The opportunity structures in these occupations contrast sharply with the opportunity structures in occupations where black workers are overrepresented such as baggage porters or garbage workers. They contrast as well with professional occupations such as human resources specialist or positions designed to provide services specific to black communities because these positions tend to lack institutionalized paths of upward mobility (Collins 1997, Vallas 2003).

The use of race and sex as criteria for hiring and job assignment was both legal and common until the mid-1960s. Black men and women were openly discriminated against as many employers explicitly indicated the race and sex of desired applicants and some prescribed different rates of pay depending on workers' race (Darity and Mason 1998, Reskin 2001). As a result, in 1960 over half of black or white women and 44 percent of black or white men would have had to move into an occupation in which their racial group was underrepresented for occupations in the U.S to be completed integrated (King 1992).

Civil rights activists during the 1950s and 1960s increased their demands for legislation to address the legal and all-too-common practices of race and sex discrimination. As activists

held protests and carried out marches, television allowed images of police brutality against the protestors to be viewed in homes across America, images of fire hoses and dogs being turned on protesters, including children. African American activists and white middle class college students continued to resist and challenge segregation, occupational and otherwise, through the use of "freedom rides", "sit-ins" and "jail-ins", among other tactics (Carson et al. 1991, Morris 1984). Policy makers argued that media coverage of police violence toward blacks harmed the image of the United States in the Cold War (Dudziak 2005). This pressure for social change from activists and concern with the way in which other countries viewed the U.S., along with a number of unanticipated events, including the assassination of President Kennedy, came together to create a sea change in social policy culminating in The Civil Rights Act of 1964 (hereafter CRA). Title VII of the CRA specifically addressed employment discrimination, explicitly banning discrimination in hiring, pay, training or promotions based on race, ethnicity and/or sex. Section 703 of the Civil Rights Act states:

> "It shall be an unlawful employment practice for an employer –
>
> > to fail or refuse to hire or to discharge any individual, or otherwise to discriminate against any individual with respect to his compensation, terms, conditions, or privileges of employment, because of such individual's race, color, religion, sex, or national origin"

The act further made it illegal to differentially assign workers of different groups into different jobs. The Act states that it is an unlawful practice for employers

> " to *limit, segregate, or classify* employees in any way which would deprive or tend to deprive any individual of employment opportunities or otherwise adversely affect his status as an employee, because of such individual's race, color, religion, sex, or national origin."

In order to monitor compliance with the Civil Rights Act and act as a mediator when evidence of discrimination was found, Title VII also created the Equal Employment Opportunity Commission (EEOC). Initially the EEOC was limited to mediating between employers and

victims of discrimination; it had no authority to sanction Title VII violators. In 1972, the EEOC was given the authority to file charges against employers when discrimination could be shown. These lawsuits increased the costs to companies of discriminating and should have led to a decline in discrimination over time (see Stainback, Robinson and Tomaskovic-Devey 2005).

In addition to the protections of the CRA of 1964, President Lyndon Johnson issued Executive Order 11246 in 1965.[28] In contrast to the CRA which prohibited discrimination for all employers with 25 (later 15) or more employees, this order required government contractors to agree not to discriminate against racial and ethnic minorities and women in order to receive federal contracts. Federal contractors were required to take positive steps ("affirmative actions") to ensure that all workers were treated equally, regardless of race or sex (Harper and Reskin 2005, Reskin 1998). The Office for Federal Contract Compliance Programs (OFCCP) was established to monitor federal contractors' compliance.

Affirmative action addresses sources of discrimination that come about simply by employers' routine practices and procedures (Reskin 1998, 2001). Thus, affirmative actions[29] taken by employers range from formalizing hiring procedures in order to reduce the impact of stereotyping or other cognitive biases to widely advertising positions and recruiting through employment agencies and community groups rather than referrals from current employees (Reskin and McBrier 2000). As a result of these changes, between 1960 and 1980 black-white

[28] This was not the first executive order that prohibited discrimination on the basis of race. For example, In 1941 President Roosevelt issued Executive Order 8802 prohibiting discrimination by war contractors on the basis of race, ethnicity or national origin.

[29] While affirmative action has often been equated with quotas, the Supreme Court has ruled that quotas may be used in very limited circumstances such as by court order when there is evidence of egregious discrimination. Even then, quotas must be the only remedy available and cannot serve to deny jobs or promotions to male or non-minority applicants and workers (Reskin 1998, fn. 5).

occupational segregation dropped by 26 points among women and by ten points among men (King 1992, see also Cunningham and Zolakar 1992, Jacobsen 1994).

While the dramatic decline in racial occupational segregation between 1960 and 1980 indicates important progress in the pursuit of racial equality, King's (1992) findings of the extent of change between 1980 and 1988 highlight the importance of continuing to monitor segregation trends. King's analysis of black-white segregation at the level of detailed occupations through 1988 showed that while levels of segregation continued to decline after 1980, they did so at a much slower pace than in the previous two decades. In fact, her data showed that despite the substantial declines in segregation through 1980, by 1988 roughly 30 percent of black or white workers (29 percent of women and 32 percent of men) would still have had to move into an occupation in which their group was underrepresented for black and white same-sex workers to have had the same occupational distributions.

Summary of Findings

The importance of occupational segregation in creating and perpetuating racial inequality, the apparent stalling of occupational integration after 1980 and the paucity of research on racial occupational segregation after 1990 prompted this study of the post-1988 trends in the occupational segregation of black and white men and women. To determine the levels and trends in black-white occupational segregation, I estimated segregation indices for black and white full-time, full year (FTFY) same-sex workers for each decade between 1980 and 2009. My results show that between1980 and 2000 the decline in segregation slowed for women and stopped for men. After 2000 trends toward occupational integration stalled and, for some subgroups, reversed. Pooled data for 2005 to 2009 show that roughly a quarter of black or white

workers would have had to move into an occupation in which they were currently underrepresented for both blacks and whites to have had the same occupational distributions. Because I examined segregation for black and white same-sex workers, these results understate the degree to which black and white workers are segregated in the labor market since black women are even more segregated from white men than they are from white women, and white women are more segregated from black men than they are from black women (Tomaskovic-Devey and Stainback 2007). Thus, black and white workers remained segregated to a nontrivial degree through the first decade of the 21st century.

I then examined the sources of the declines in segregation. I found that about half of the decline in segregation from 1980 to 2000 stemmed from changes in the occupational structure rather than from the increased integration of occupations. Relatively integrated occupations such as those in the low-skilled service sector employed a growing share of workers, while more segregated occupations such as blue-collar manufacturing, employed a shrinking share of workers. This finding implies that, despite anti-discrimination legislation and affirmative action regulations for federal contractors, only half of the modest integration that occurred since 1980 can be attributed to changes in employers' hiring and job assignment practices. Instead, many employers appear to have continued using the same, often segregative, hiring and job assignment practices such as hiring through networks (Royster 2003). These practices predictably generate race-related inequality independent of employers' intentions (Reskin and McBrier 2000).

I then examined segregation for subgroups of workers defined by educational attainment, age and region of the country. These analyses show that while all groups of workers experienced declines in segregation between 1980 and 2000, segregation levels stabilized or increased between 2000 and 2009. For example, men and women with less than a high school education

experienced declines in levels of segregation of four and five points respectively between 1980 and 2000. Between 2000 and 2009, however, both men's and women's segregation indices increased by three points. Among workers with at least a bachelors degree men's and women's segregation indices dropped by three points and two points between 1980 and 2000 but between 2000 and 2009 only men saw a further one-point decline.

After establishing that the trend toward black-white occupational integration had indeed slowed after 1980, I used fixed effects regression models for longitudinal analyses to determine how changes in an occupation's characteristics between 1980 and 2010 were associated with the changing occupational distribution of black men and women. Among the occupational characteristics whose effects I examined were earnings, unemployment, share of jobs in the public sector and the share of jobs filled by immigrants and workers of the other sex.

I found that occupations that employed more low-wage workers in each successive decade also employed more black men, but not more black women. Black women's employment actually declined in occupations with increased shares of low-wage workers. However, increased unemployment in an occupation was associated with increases in the representation of both black men and women. Because wages and unemployment are primary factors that workers use to rank occupations, black men's increased representation in jobs with declining wages and greater unemployment most likely reflects employers' unwillingness to hire them in better occupations where other workers are available.

In those occupations with relatively small increases in the employment of either black women or black men, black workers of the other sex also made gains. However, in occupations in which there were relatively large increases in the employment of black women, black men's representation fell, and large gains by black men similarly resulted in a decline in the

employment of black women. Illustrating how race modified the impact of sex, however, my results also showed that relatively small increases in the employment of white men and women were associated with a decline in the employment of their black other-sex counterparts. Thus, if black women made small gains in representation in an occupation, black men also made gains in representation. If white women's representation increased, however, black women's representation declined. Black men experienced similar outcomes.

I also examined the relationship between changes in the share of an occupation's workforce that was comprised of foreign-born workers and the representation of black workers. Again, because of high levels of occupational sex segregation, I considered only same-sex immigrant workers. My results show that an increase in the employment of immigrant workers was positively related to an increase in the employment of black workers until immigrant men exceeded nine percent and immigrant women exceeded six percent of all same-sex workers. After immigrant workers' representation exceeds these values, black workers' representation began to decline. Thus, it appears that after non-white workers made small or modest gains in representation within an occupation, black men's and women's access also increases. However, small or modest increases by white workers or larger increases by immigrant workers served to limit black workers' access.[30]

While the results of these analyses give us ample reason to be concerned about trends in black-white economic inequality, they tell only part of the story about the extent to which blacks are economically disadvantaged relative to whites through their jobs or access to the labor force. First, I focused on *employed* workers. However, black workers tend to be unemployed at twice the rate of white workers even in good economic times (see Mishel et al. 2009). Moreover,

[30] Large increases in the proportional representation of white workers in an occupation are positively associated with the representation of black other-sex workers.

unemployment rates may underestimate the black-white gap because they exclude two groups of workers who have left the labor force—groups that are disproportionately black. The first is "discouraged workers", persons who have sought employment but have given up a continuing search as hopeless. Although African Americans are just thirteen percent of the labor force in 2012, they constituted 26 percent of discouraged workers (Bureau of Labor Statistics 2013, Mitchell 2013). The second group that has left the labor force and hence are omitted from the unemployment rate are the incarcerated (Pettit 2012, Western and Pettit 2005). Thus, the disproportionate rate of incarceration of black males (Alexander 2010) artificially reduces their unemployment rate, thereby likely inflating my estimates of blacks' economic progress (Western and Pettit 2005). Finally, my focus on persons working full-time year round and black workers cannot take into account that blacks are more likely than whites to be underemployed or working in part-time or other contingent positions (Kalleberg et al. 2000).

Public sector employment has long been particularly important for black workers generally. Its greater openness to blacks has helped to reduce levels of occupational segregation because the public sector is less segregated than the private sector. In 1980 women employed in the public sector had a segregation index of .25, compared to .31 in the private sector; the respective numbers for men were .28 and .36. By 2000 segregation levels had fallen in both the public and private sectors for both sexes, but the public sector remained less segregated than the private sector. However, according to my 2009 estimates women experienced no further declines in segregation after 2000 in either the public or private sector, while men experienced a one-percentage point decline in segregation in the public sector but no change in the private sector. The loss of over 700,000 state and local public sector jobs since July 2008 (Irwin 2013),

however, is sure to produce an upward pressure on segregation levels, further slowing the trend toward integration.

Finally, my analyses highlight the importance of immigration *policies* for black-white occupational segregation and economic inequality. The millions of undocumented workers in the U.S. allow employers to exploit and abuse these workers, reducing their earnings and job quality. Providing these workers with legal status would provide them with the ability to challenge workplace abuse and, potentially, to raise wages and improve their working conditions. Immigrants who are legally able to work in the U.S. may be more likely to leave low-paying jobs for other opportunities that are not available while they remain undocumented. As a result, employers may be forced to raise wages in these jobs if they are to maintain their workforces and, as a result of better wages and working conditions, these jobs will become more attractive, or at least less unattractive.

If the United States takes seriously its nominal commitment to racial equality, the above analyses show the need to develop and implement more effective policies to address occupational segregation. Access to education and the labor market are both important. I have shown that better educated workers are less segregated. Thus ensuring equal access to quality primary, secondary and higher education for African Americans is vital. This means addressing barriers such as the quality of the primary and secondary education all students receive as well as the growing costs of higher education (Royster 2007). Because higher education is neither possible nor necessary for all workers, it will be important to ensure equal access to information about the full range of occupational possibilities. We must provide additional access to job training and apprenticeships, to information about the full range of occupational possibilities and to information about job openings and promotion opportunities (Royster 2003; McGuire 2000).

In addition to preparing workers for the job market, we must ensure that those workers already in the job market receive nondiscriminatory treatment. Accomplishing this requires ensuring adequate funding and a strong mandate for enforcement for the Equal Employment Opportunity Commission (EEOC) and the Office of Federal Contract Compliance Programs (OFCCP). The degree of funding and political support for these agencies is crucial to their ability to effectively pursue discrimination claims and monitor compliance with civil rights laws (EEOC 2011). When enforced in the late 1960s and the 1970s, civil rights laws prompted many employers to change how they recruited, hired, assigned jobs, and promoted workers which increased occupational integration (Collins 1997; Holzer and Neumark 2000). Effective enforcement not only impacts employers directly involved with these agencies, but can create general norms that diffuse across employers (Sutton and Dobbin 1996, Hirsh 2009). Unfortunately, politics affect the level of support and resources these agencies receive (Kelly and Dobbin 1998; Wood 1990). If these agencies are to be effective, their access to resources must be severed from shifts in the political landscape.

Finally, job creation must be a priority. The occupational gains of African American workers during the 1960s and 1970s reflect a number of factors, of which the robust economy of the 1960s was certainly one. When labor markets are tight, black workers are more likely both to be employed and to gain access to occupations previously closed to them (Cherry 2001, Massey and Denton 1993). However, over the last 30 years the black unemployment rates has been double that of white counterparts (Vedder and Gallaway 1992). Thus, as long as black workers and other people of color disproportionately cluster near the bottom of employers' labor queues, slack labor markets will increase black workers' unemployment rates and reduce their representation in better jobs.

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APPENDIX A: Means and Standard Deviations by Decade

	1980		1990		2000		2010	
	Mean	**S. D.**	**Mean**	**S. D.**	**Mean**	**S. D.**	**Mean**	**S. D.**
Black female	3.90	4.51	4.33	4.50	4.73	4.69	4.73	4.63
Black male	5.45	4.41	5.69	4.23	5.95	4.18	5.89	4.11
White female	28.22	24.10	28.75	23.07	27.00	21.29	25.33	20.21
White male	54.54	26.26	49.82	25.03	46.21	23.36	43.73	22.27
Immigrant female	6.52	3.81	8.91	5.37	13.14	7.96	15.75	10.20
Immigrant male	7.28	4.38	10.60	6.44	14.69	8.61	17.19	10.19
Median education	6.96	1.79	7.09	1.60	7.11	1.69	7.32	1.74
Low-wage	22.80	17.31	21.63	16.98	17.69	14.94	20.25	16.51
High income	0.47	1.67	0.57	1.99	0.88	2.53	0.91	2.87
Unemployed	5.03	3.95	4.64	3.26	3.87	2.57	5.48	3.51
Union coverage	*	*	18.98	20.12	15.72	17.60	14.27	17.41
Pension	*	*	47.48	21.84	50.71	20.76	46.57	19.49
Part-time	16.43	14.19	16.55	14.06	15.97	13.83	18.18	15.34
Occupation size	301	605	346	675	411	692	437	765
Mean firm size	*	*	5.25	0.78	4.85	1.07	4.80	1.06
Public sector	18.97	23.44	16.11	21.21	15.44	21.33	14.88	21.07
Self employed	3.90	9.66	4.46	9.24	4.86	9.61	4.71	8.81
Nonsouth	67.75	8.82	65.92	8.25	64.36	7.96	63.76	7.97
Suburb	17.83	9.57	43.90	11.54	47.79	10.83	49.31	10.49

* Values not available in data set in 1980

Appendix B: Occupations dropped due to missing value in any year

Occupation	Occ1990 Code
Adjusters and calibrators	693
Biological science instructors	114
Chemistry instructors	115
Cost and rate clerks (financial records processing)	343
Crushing and grinding machine operators	768
Duplication machine operators/ office machine operators	345
Earth, environmental, and marine science instructors	113
Economics instructors	119
Education instructors	139
Electrical and electronic (engineering) technicians	213
Engineering instructors	127
Fabricating machine operators, n.e.c.	717
Food counter and fountain workers	438
Hand painting, coating, and decorating occupations	789
History instructors	123
Home economics instructors	149
Horticultural specialty farmers	474
Information clerks, n.e.c.	323
Law instructors	145
Managers of food-serving and lodging establishments	17
Managers of horticultural specialty farms	476
Managers of service organizations, n.e.c.	21
Marine life cultivation workers	483
Materials movers: stevedores and longshore workers	876
Math instructors	128
Mechanical engineering technicians	215
Nursery farming workers	484
Office machine repairers and mechanics	538
Other precision and craft workers	684
Other precision apparel and fabric workers	674
Other precision woodworkers	659
Photoengravers and lithographers	735
Physics instructors	116
Private household cleaners and servants	407
Production checkers and inspectors	796
Psychology instructor	118
Shaping and joining machine operator (woodworking)	728
Sociologists	168
Sociology instructors	125
Solderers	784

Statisticians	67
Stenographers	314
Stock handlers	877
Tailors	667
Teacher's aides	387
Technicians, n.e.c.	235
Theology instructors	147
Tinsmiths, coppersmiths and sheet metal workers	653
Water transport infrastructure tenders and crossing guards	834

Additional Occupations Dropped in Fixed Effects Models	
Judges	179
Legislators	3
Postmasters & Mail Superintendants	16