HEALTH CARE OCCUPATIONS: ROAD TO SUCCESS OR PATH TO DEAD END?

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The following faculty members have examined the final copy of this thesis for form and content, and recommend that it be accepted in partial fulfillment of the requirement for the degree of Master of Arts with a major in Sociology.

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ABSTRACT

Health care provides an attractive career choice for individuals seeking employment in a growing field with livable wages and quality benefits. Jobs in health care services are projected to increase significantly in the coming decades. Like other skilled professions, significant disparities exist regarding who works in the positions that are highest paying and often most rewarding. This project investigates the representation and incomes of mi norities in health care professions. Individual, structural, and race/gender theories provide the theoretical framework for the composite model. Using secondary data from the Current Population Survey (CPS) March 2008 Annual Social & Economic Supplement (ASEC), a sample of 19,693 health care workers were used for this study. Univariate, bivariate, and multivariate analyses were used to test the composite model hypotheses. The findings of this research indicate that net of other factors, minority health care workers earn $3,036 less annually than non-minorities. Additionally, minorities are disproportionately concentrated in lower compensating occupations.

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1. Introduction

Health care provides an attractive career choice for individuals seeking employment in a growing field with livable wages and quality benefits. Jobs in health care services are projected to increase 25.4% by 2016 (U.S. Department of Labor, Bureau of Labor Statistics, 2009[a]). Lack of replacement labor for retiring health care providers and the increased demand of services by an aging population is expected to exacerbate labor shortages. In attempts to reduce shortages, educational and training initiatives have been created in order to increase labor pools with workers attracted by perceived stability and good wages (Palumbo, Rambur, McIntosh, and Naud, 2008). Like other skilled professions, significant disparities exist regarding who works in the positions that are highest paying and often most rewarding. Women, people of color, people of lower socioeconomic status, and immigrants account for most of the people occupying positions in the lowest paying sectors of the health care economy.

Occupations in health care have wide gaps in the required education and training necessary to gain employment. Some researchers suggest structural hierarchies in health care provider networks exist in part because of these gaps (Glen, 1987). Not all professional distinctions can be determined by education or training alone. Researchers have suggested that cultural factors influence occupational composition, wages and prestige (Hinze, 1999). Diagnostic providers, often doctors with a medical education, reside at the top of the provider hierarchy (Glen, 1987). Support providers such as nurses and physical therapists have at least a college degree and more frequently have earned graduate degrees. Support providers do not experience the same occupational prestige or income as diagnostic providers, but they do maintain moderate levels of status in medical settings (Glazer, 1991). Service providers like certified nursing assistants and other health aids often have some education or training and

experience the least amount of prestige and income (Glazer, 1991). There is little mobility between occupations and organizational career ladders are limited by rigid regulatory credentials (Queneau, 2006).

Researchers continue to investigate the representation of minorities in health care professions, both their underrepresentation in diagnostic and support occupations, and their concentration in service positions (Duffy, 2005; Gabard, 2007). The racial and gender composition of health care occupations is relevant to research assessing income inequality; it would be a mistake to assume they are not related. Theories rooted in individualistic concepts of earnings potential assert challenges in wage inequality can be overcome by utilizing and gaining access to resources. Jobs in health care offer wages that reward individuals based on competitive skills, education, and abilities. Structural models assert that wage determination is based upon the position occupied, and hierarchies are necessary to attract the most qualified persons to positions. Individual attributes are of little importance in wage determination compared to the position occupied. Theories used to support the race model borrow from gender theoretical perspectives. Gender theorists suggest that the gender/racial composition of an occupation influence the pay and prestige of jobs. The composite model used in this research is composed of theories that suggest systemic processes influence health care industry labor pool patterns. These processes support income stratification by sorting minorities into low-paying occupations and fields. Furthermore income inequality exists in all health care occupations, becoming even more pronounced in the high-earning groups.

2. Literature Review

2.1 Individual Models

According to rational choice theory, individuals make choices based on rational preferences and have goals which their actions support (Ritzer, 2004). In the framework of this theory, workers make decisions based on their skill levels and personal preferences (Kaufman, 2002). This theory assumes that actors have access to the necessary resources and information in order to make decisions about their occupational options (Ritzer, 2004). Segregation of occupations is viewed as a product of the decisions made by individuals rather than structural limitations. Thomas (1995) analyzed the earnings of professional and non-professional black men compared to their white peers, and it was not until 1970 that black professional men were earning more than white non-professional men. Historically, black families sent their daughters to college because women experienced more occupational segregation than black men, who were able to find work that did not require a college education (Staples, 1988). The incentives to enter professional occupations were limited by wage inequalities until recently. Minority women were able to gain access to health care occupations that were gendered and at times racially segregated, but the increased access did not necessarily translate into increased wages. Rational choice theory predicts that workers have the agency to choose occupations that best suit their needs and skills. For example, blue collar factory jobs, when they were plentiful, offered decent wages to minority men and these jobs did not require the high cost of education and credential attainment required of most health care professions.

The gendering of professions within health care is often explained by the assumption that women choose nursing and other caretaking positions because of their nurturing nature (Kaufman, 2002). This assumption is contradicted by studies suggesting that social constraints

affect occupational availability and choice (Figart and Bergmann, 1989; Jacobs, 1989; Reskin and Roos, 1990). Rational choice theory assumes that actors apply discriminating methodology in career pursuits, and that personal desires and abilities influence their reasoning. Women may consider the costs and time necessary to complete higher status professional programs prohibitive, and may think that such pursuits reduce their chances of having a family friendly career (Kaufman, 2002). Women seeking a career with flexibility have long found nursing to be an acceptable alternative. The racial segregation of professional and service type careers within health care is more difficult to parse out. Research suggests that minorities may not pursue certain occupations if they anticipate racial discrimination, and it is suggested that racial bias may be amplified for minority men in health care occupations (Wingfield, 2009). Occupations traditionally identified as male, such as doctors, may not have the same barriers for minority men than occupations traditionally identified as female. Men may be more accepted by patients and peers working in physical therapy, a field that is related to sports and is considered more rehabilitative than care work, than nursing (MacLean and Rozier, 2007). As Wingfield (2009) notes Black male nurses experience suspicion and alienation from coworkers and supervisors because of the stereotypes of the hypermasculinity of Black men. Young men interested in the field may find challenging racial and gender stereotypes simultaneously a daunting task and as a result may not pursue such training and career opportunities.

Human capital theory argues that an individual's income is directly related to investments the person makes in gaining knowledge and skill (Becker, 1992). These investments include formal education, on the job training, and apprenticeships. A rational cost and benefits approach is applied to decisions about occupation and the training necessary to participate in the workforce (Becker, 1992). The acquisition of skills and knowledge allows a labor force

participant to exchange time and services for monetary reward. Therefore income is said to reflect an individual's investment in human capital (Becker, 1992).

The reward for increased intellectual capital in terms of income result from both formal education and on the job training (Mincer, 1962). The value of formal education differs based on the length of time required to complete an educational program. Knowledge obtained by formal education is further supplemented with on the job training which varies by occupation (Mincer, 1958). The expense of obtaining an education is largely a private cost absorbed by the individual, whereas the costs associated with on the job training are a business expense for the employer (Mincer, 1962). Due to the cost of on the job training, employers have an incentive to be selective about which employees receive expensive training resources. Additionally, maintaining high retention rates of employees who receive specialized training is necessary in order to maximize the organization's investment (Mincer, 1962).

Human capital theory explains that occupational segregation exists because of the lack of education and skills necessary to participate in the competitive marketplace (Kaufman, 2002). When comparing the composition of physician specialties, recognizing that until recently white males were the majority in every position is critical to understanding current divisions. The credential requirements to become a licensed physician have not changed as much as the composition and compensation of physician specialties. As women and minorities enter diagnostic provider occupations, support and service provider occupations remain gender and racially segregated (England, Allison, and Wu, 2007). Women and minorities may experience periods of education and career disruption because of social constraints that prove to be challenging. Per human capital theory, proper credentials and skill is not the only component of wage determination. Work patterns that demonstrate commitment to career success is another

important factor. Seniority and credentials often determine promotions and pay raises; with white men experiencing less career interruptions than women (Brown and Jones, 2004). For women, especially women of color who still shoulder much of the responsibilities of family, career interruptions seem inevitable.

A broad field like the health care sector provides an opportunity to assess series of jobs and positions that are clearly defined and segmented. Differences in the qualifications necessary to work in a specialized job, such as a nurse or radiology technician, make tracing the qualifications of applicants relatively easy. Queneau (2006) found that despite years of job proliferation and growth in the health care sector, the labor market is still gender/racially segregated. Between the years 1983 and 2002 racial composition of occupations within health care became more integrated, but the distribution is not representative of the population (Queneau, 2006). Minority enrollment in professional programs has increased in the last 20 years; however minorities and women are over-represented in lower-paying and lower-status occupations (Gabard, 2007). Nearly 50% of medical school students are women, yet most female physicians are concentrated in family specialties (Weeks and Wallace, 2006). Minorities, excluding Asians, constitute roughly 20% of medical students (AAMC Report, 2008). Minority medical students are more likely to anticipate working in organizations and areas that provide services to underserved populations (Weeks and Wallace, 2006). Working in specialties that focus on family services or underserved populations reduces income potentials for the physicians as compared to their peers providing private or specialized services.

Within the context of status attainment theory, occupational decisions are made based on the individual's origin in life (Deng and Zhang, 2008). A family's economic position influences the resources available to invest in their children's human capital (Wagmiller, Lennon, Kuang,

Alberti, and Aber, 2006). Investment in education is a factor in generational social status mobility (Blau and Duncan, 1967). Families of means have access to resources that expand educational opportunities while families of lower socioeconomic standing face limitations of affordability and access.

Society is assumed to be in collective agreement about occupation prestige in status attainment theory, especially in the Wisconsin Model (Balkwell, Bates, and Garbin, 1980). The economic climate, however, is what dictates intergenerational movement between occupations (Blau, 1965). A stable economy meant that many blue collar workers were able to secure a stable position for themselves and eventually their children in the industry they worked in. In times of economic prosperity intergenerational movement is possible when occupations are experiencing worker shortages (Blau, 1962). The blue collar factory workers were able to afford sending their children to college to enter emerging occupational fields. However, because career trajectories typically progress as one ages, it is often the case that before individuals gain experience, they in fact are downwardly mobile from their original economic position (Blau, 1965). With age individuals can, generally speaking, expect their income to increase as they gain experience in their profession.

2.2 Structural Models

Contrary to the individualistic models, structural models view income as a function of positions occupied by individuals within a hierarchical structure as opposed to choices made by individuals. Rewards in the form of compensation and occupational prestige are determined by the location and consensus of the importance of the positions in the organizational structure (Wysong, Perrucci, and Wright, 2002). According to structural theories, distribution of labor in organizations occurs as a result of dual economies and labor market segmentation.

In dual economies, industries are divided by their position and control of a particular market (Zucker and Rosenstein, 1981). Large capitally intensive operations are referred to as core sectors, or monopolistic, and smaller firms that are more local or regional make up the competitive sector (Zucker and Rosenstein, 1981). Peripheral markets consist of service providers as opposed to the industrial goods produced by the monopolistic corporations. Core sector firms emerged from the Industrial Revolution as industry giants with high profits and production power, this sector of the economy can also weather fluctuations in the market more successfully than the competitive sector (Beck, Horan, and Tolbert, 1978). Although the health care industry is more service related than industrial, the development of large corporations which dominate markets regionally and nationally has resulted in core and peripheral markets. The peripheral sectors have lower profit potentials and less economic control of their production and market share (Zucker and Rosenstein, 1981).

The core and peripheral sectors access and compensate their labor pools differently, with the core sector utilizing an internal labor market and the peripheral sector relying on an external labor pool (Noyelle, 1987). Core sector industries have unionized workforces with access to on the job training, upward mobility within the organization, and more competitive wages (Noyelle, 1987). The peripheral sectors provide positions with little mobility and low wages and rely on transient labor pools (Noyelle, 1987).

The current health care economy in the United States results from decades of political influence, aborted reforms, and massive organization mergers. The health care sector is dominated by national medical systems, both for-profit and non-profit, and specialty groups (White, 2007). Large health care systems make up the core sector of the health care economy. Private and loosely affiliated providers reside in the periphery market lacking the resources and

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support of large health care systems. In many regions of the United States only a few organizations own the networks of hospitals, nursing homes, and outpatient facilities, requiring practitioners to work directly for the health system or negotiate an affiliated status (White, 2007). Unlike diagnostic providers, support and service providers lack the ability to negotiate their status in health care systems or private employment. Large medical systems dictate industry standards for employee compensation and benefits, and private practitioners find themselves struggling to compete.

In segmented labor market theory, occupational mobility between primary and secondary job markets is uncommon; primary jobs are often specialized and are accessed through internal channels (McDonald and Solow, 1985). Primary jobs also provide stable and autonomous employment positions filled by specialized individuals earning wages higher than average (McDonald and Solow, 1985). Secondary jobs are characterized as transitional and task oriented, reducing wages and prestige of the position and those who occupy them (Coverdill, 1988). In the segmented labor market wages are largely uniform and stable in the primary positions, but more varied and insecure in the secondary positions (McDonald and Solow, 1985). Primary occupations in health care are skilled positions and often require credentials in order to be hired. Diagnostic and support providers such as physicians and respiratory therapists are primary occupations in the health care industry. Secondary job categories such as health care service workers require very little training, and are occupied disproportionately by minority women (Duffy, 2007).

Women and minorities are over-represented in the secondary labor market (Beck, Horan, and Tolbert, 1978). Beck, Horan, and Tolbert (1978) suggest that there is less discrimination in terms of earnings in the secondary market than the core. It is possible that earnings disparities

are built in through other mechanisms, such as sorting into lower paying jobs or increased

competition, rather than outright pay discrimination in the secondary market. The U.S.

Department of Labor, Bureau of Labor Statistics (2009[b]) reports that in 2008 Blacks made up

11% of the employed population, and roughly 34% of health care aides were Black. Although

minorities have increased their participation in the primary labor market considerably in the last

40 years, their representation in primary health care professions has not reached parity with their

population distribution (Gabard, 2007). Blacks and Hispanics account for 25% of employed

persons, yet combined they make up only 12% of physicians (U.S. Department of Labor, Bureau

of Labor Statistics, 2009[b]).

Establishment of a structural hierarchy in health care occupations evolved within societal

contexts and rapid technological advances. Occupational prestige levels for health care

providers historically reflect the value society assigns to each occupation, conferring highest

levels of prestige to physicians. Medical advancement promoted higher degrees of specialization

among providers, prompting the restructuring of divisions of labor within occupational groups

(Zetka, 2001). As surgeons tracked and presented their successes in medical interventions to

colleagues, they quickly ascended from "craft" practitioners to "heroic" specialists elevating

their occupational prestige (Zetka, 2001). To practice surgery now requires extensive training

post medical school, justifying higher levels of income. Surgeons are now separated from

patients by layers of providers occupying positions of less prestige and arguably less skill (Zetka,

2001).

Direct care providers make up a small proportion of the health care primary job market,

and they are ranked highest in terms of occupational skill level. The rest of the primary job

market in health care is made up of direct care assistant and indirect care providers, all of which

exist on a gradient of skill level. The secondary job market in health care is primarily indirect assistant care providers, mostly medical and dental assistant types of jobs with minimal educational and certification requirements. These jobs are ranked the lowest in terms of occupational skill and are highly segregated by gender and race. Secondary jobs that are low skill and high turnover are less desirable and yet one of the fast growing sectors in the health care workforce (Watson, 2007). While the system requires the different types of providers to work in tandem to provide care for patients, the different labor markets supplying health care systems amplifies the gulf between the different types of providers. Hierarchies of providers are maintained and the direct care providers remain distinct from other providers.

2.3 Race Models

The previous theoretical models suggest that disadvantaged participants in the labor market have the capacity to overcome limitations impeding their labor force participation. The theoretical framework for the race models used in this research borrows from the work of gender theories. All disadvantaged populations are subject to the process of devaluation and sorting at both the individual and structural levels. Race and gender can be conceptualized as similar because of the ascriptive nature of both variables (Jacobs and Blair-Loy, 1996). Occupational and job segregation by gender is well documented and the most ubiquitous practice of sorting (Reskin and Roos, 1990). How race and ethnicity compounds segregation is less clear. The gender literature suggests the process of segregation in labor markets occurs on both the supply and demand side (Tomaskovic-Devey, 1993).

Most men and women work in occupationally segregated jobs (Figart and Bergmann, 1989). Although occupational integration has increased in the last several decades, research has identified a more specific sorting at the job level within organizations (Figart and Bergmann,

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1989; Reskin and Cassirer, 1996; Tomaskovic-Devey, 1993). Occupational segregation occurs when workers in a specific occupational category are predominately the same race or gender (Figart and Bergman, 1989). Nursing continues to be distinctly segregated by gender, 91% of employed nurses are women (U.S. Department of Labor, Bureau of Statistics, 2009[a]). Sorting at the job level takes shape when specific positions have unbalanced gender/race ratios. Integration of women physicians has reached levels representative of the U.S. population. However, on a more micro level, female physicians are concentrated in the lowest compensated specialties such as family medicine, pediatrics, psychiatry, and obstetrics and gynecology (Hinze, 1999). As of 2007 women made up 49% of graduates from medical schools (AAMC, 2008). Despite the perception that women have made gains because of their high enrollment status in medical schools, the only primary care specialty where women make up more than 50% of physicians is general pediatrics (AAMC, 2006). Thus, women are still being sorted into lower paying occupations in medicine. Other specialties with high concentrations (over 40%) of women include internal pediatrics, child and adolescent psychiatry, geriatric medicine, neonatal/perinatal, and obstetrics/gynecology, all of which pay considerably less than specialties such as surgery (Weeks and Wallace, 2006).

Crowding theory proposes occupational segregation results from shrunken labor markets for women and minorities. Sex segregation appears to be the initial sorting mechanism followed by race in the same-sex occupational categories; reducing access to occupations for some women of color and increasing competition in those smaller occupational subsets (Reskin and Cassirer, 1996). Malveaux (1990, as cited in Cotter, Hermsen, and Vanneman, 2003) suggests that crowding in segregated labor markets is particularly problematic for black women who often compete in smaller labor markets than white women. Minorities employed in health care

comprise nearly 39% of service workers, as opposed to 16% of diagnostic and support providers (U.S. Department of Labor, Bureau of Labor Statistics, 2009). Women of color compete for jobs with high turnover, low wages, and less desirable working conditions.

Occupational segregation functions as a feedback system preserved by historical discrimination, implicit contracts, and workplace interactions according to Jacobs' Revolving Door theory (Jacobs, 1989, p. 175). Gender role socialization is considered a lifelong process shored up and reinforced at the individual and structural level beginning early in life and continuing through educational and eventually occupational development (Jacobs, 1989). White males have a vested interest in maintaining a rigid hierarchy in occupations, not only for their own career ambitions, but also in order to have access to cheaper sources of labor as they advance in their profession (Figart and Bergmann, 1989). Devaluation of female occupations persists in this model driving down wages and prestige. Jacobs identified attrition and exclusion as maintaining occupational segregation despite integration in occupations; as evidenced by women exiting male dominated jobs for traditionally female occupations (Jacobs, 1989; Jacobs, and Blair-Loy, 1996).

According to Reskin and Roos (1990) occupational labor pools segregate as the result of job queues ranked by both employers and employees, resulting in gender specific preferences. Employers seeking to fill a position rank the most desirable candidate, likely a white male, and move down their queue until the position is filled (Roos and Manley, 1996). Workers also rank jobs from most desirable to least desirable. As men leave jobs because of declining wages or loss of prestige, employers move down their queues and gender compositional change occurs as a result (Reskin and Roos, 1990). In addition to gender queues, literature suggests race queues exist as well (Jacobs and Blair-Loy, 1996). Racial queues operate as an additional ascriptive

characteristic in identifying labor pools (Jacobs and Blair-Loy, 1996). Unlike the wage depreciation of feminized occupations, racial queues are utilized more often for channeling minorities into the lowest paying jobs, not necessarily decreasing the overall wages of an occupation (Jacobs and Blair-Loy, 1996).

The home health care industry provides an example of channeling minorities into lower paying occupations. Watson (2007) reported on the occupational composition of elder care industries and found that between 1990 and 2005 employment in the home health care sector grew 183%. The majority of those employed in the home health care sector are support and service providers (59%). Of the support providers roughly 56% are registered nurses, and another 25% are licensed practical and licensed vocational nurses (Watson, 2007). Health care aides comprise 86% of service providers in the home health care sector. Service and support providers make up roughly 65% of occupational groups in community and nursing facilities (Watson, 2007). Hispanic workers make up roughly 16% of personal and home health aides, while Blacks make up 24% of personal and home health aides (Watson, 2007).

Researchers Filinson, Cone, and Ray (2005) examined the impact of welfare reform on the long term care labor market. Several states and organizations created programs to recruit welfare recipients to health care service work as certified nursing assistants, nursing aides, and home health care aides. Health care employs more welfare to work program participants than any other industry (Filinson, Cone, and Ray, 2005). Essentially the programs were created to alleviate welfare reliance and health care shortages by channeling already disadvantaged, mostly non-white, women into jobs with low wages, minimal benefits, and little opportunity for advancement.

Bergmann (2006) provides evidence of the intersection of occupational devaluation and gender/racial queues in her analysis of our country's nursing shortage. Wages for nurses remain stagnant compared to male occupations with similar education requirements. As the occupational demands of the profession increase without corresponding income incentives, health care administrators have trouble retaining employees (Bergmann, 2006). Instead of raising wage scales across the occupation, hospitals and other major employers have moved down their job queues from the preference of white women to actively recruiting foreign and minority women (Buerhaus, 2008). As Bergmann notes, by failing to increase wages for nurses, the health care industry creates an occupational category attractive to only a few. As a result men continue to be disinterested in nursing as a career, and white women continue to leave the occupation (Bergman, 2006).

2.4 Composite Model

The preceding models offer individual, structural, and racial/gender theories of wage determination. Prior research suggests that the mentioned theories explain some but not all of income discrepancies. Integration of the three models resulted in the development of the composite model used in this study. The theories discussed in the individual model assert that humans make rational choices regarding investment in human capital. The acquisition of education and skills are determined by a cost-benefits analysis, and income potential is a product of the resulting investment. An individual who invests in a bachelor's degree in nursing will see higher economic yields than someone who only completes an associate's degree in nursing. Individual theories explain income increases as a labor force participant gains experience. For the purpose of this research age serves as a proxy for experience. Structural model theories suggest that income is determined by positions occupied and the corresponding hierarchy and

prestige of the positions. In the structural model, compensation corresponds to the labor market

segment and occupation prestige. For example, an internist receives a higher return on

educational investment than a pediatrician. Literature in gender and race theories have

documented the segregation of disadvantaged populations in lower-paying jobs and occupations

through the processes of devaluation and sorting. Wages reflect the gender composition of the

occupation with traditionally "masculine occupations" offering higher wages. Occupations that

are racially integrated are sorted initially by gendered jobs and secondly by race; therefore

minority women are disproportionately represented in the lowest paying health care occupations.

2.5 Hypotheses

Individual Model

1(a):

Net of other factors, increased age will increase income.

1(b):

Net of other factors, as years of education increase income will increase.

Structural Model

2(a):

Net of other factors, employment in a large organization (core sector) will increase

income.

2(b):

Net of other factors, employment in higher skilled occupations (primary market) will

increase wages.

Race Model

3(a):

Net of other factors, disadvantaged minorities will have lower income.

3(b):

Disadvantaged minorities will be disproportionately represented in lower-skilled health care occupations.

3. Methods

3.1 Data

This research uses data from the Current Population Survey (CPS) March 2008 Annual Social & Economic Supplement (US Census Bureau, 2009). The CPS is collected by surveying a probability sample of roughly 60,000 households on a monthly basis. The CPS and ASEC are carried out by the Bureau of the Census for the Bureau of Labor Statistics. The nationally representative survey collects data from a civilian non-institutionalized population living in the United States. The sample provides estimates and information regarding employment, unemployment, earnings, and hours worked. The labor force estimates are reported for only those over the age of 16.

The narrow scope of this project warranted further restriction of the sample to select only individuals employed in the previous year in the health care sector. Additionally the sample included only individuals between ages 18 and 65, and those not serving in the military. Only individuals with incomes above $5,000 annually were included in the sample. The final sample size for this study is 19,693. The CPS is a national probability sample, therefore weights were available. Weights tend to inflate the sample size and decrease standard error, allowing for false significance values. In order to use the weights for this analysis, creating a relative weight was

necessary. By dividing the mean of the weight by the weight, a relative weight was created and used to reflect the sample distribution without inflating sample size.

3.2 Variables

3.2.1 Dependent

The dependent variable used in this study is an interval level measurement of income in dollars for annual earnings. Quintiles, deciles, and centiles were created to compare income distribution descriptively.

3.2.2 Independent

3.2.2.1 Individual Models

Variables used in the individual model include age, education, region, and residential location in terms of rural or urban. Age is measured as an interval level measure by number of years. In addition to the interval measure of age in years, a binary was created for individuals of prime working age between 25 and 59 (1) and those not of prime working age (ages 18-24 and 60-65) were coded 0. Using the primary working age variable for descriptive analysis provides insight about individuals who are likely out of college and working in career occupations versus transition jobs. Age cohorts were also created for use in descriptive analysis. Age is a proxy variable since there is not a measurement of work experience.

Education was recoded from a nominal level variable of detailed degree attainment, which included categories marking into an ordinal level variable with five categories. Educational attainment ordinal measurement included levels of less than high school which was coded as 1, high school diploma coded as 2, some college (including an associate degree) coded as 3, bachelors degree coded as 4, and graduate or professional degree coded as 5. Corresponding binaries were created to match the five level ordinal measurements.

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The region that the participant resided in was recoded into a four level nominal variable, for which the categories included Midwest, South, Northeast, and West regions. Analysis determined income among health care workers to be lowest in the Midwest region. Participants were also categorized by residence in rural or urban areas. A binary for the Midwest region was created, a value of 1 indicates residing in the Midwest region and 0 indicates residence in all other regions. Lastly a binary was created for rural residence with the value of 1 indicating living in such an area.

3.2.2.2 Structural Models

Independent variables used to analyze the structural models include worker status, hours and weeks worked in the previous year, sector, company size, occupation, and occupational prestige. Hours worked is an interval level variable, and individuals working more than 35 hours a week are classified as full time workers, and part time workers are classified as less than 35 hours per week. An interval level of annual hours worked was created by multiplying hours worked by weeks worked for regression analysis. Binary variables were also used to distinguish full time full year workers, part time full year workers, full time part year workers, and part time part year workers.

Health care providers work in a variety of settings, therefore it is necessary to distinguish the employment status of workers. A six level nominal variable was created to capture this distinction. Workers were classified as private, federal government, state government, local government, self-employed incorporated, and self-employed non-incorporated. A binary variable was created for all government workers with a value of 1 and non-government employees were coded 0. Additional binaries were created for federal government employees, and state and local government employees were combined into one binary variable. A binary

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was also created for self-employed individuals with self-employed individuals coded as 1 and non self-employed individuals coded as 0.

The number of employees working for the respondent's place of employment was used to create an interval level of measurement for company size. This variable was recoded to create an ordinal level of measurement indicating the size of the company. Organizations with 1-99 employees are considered small companies and were coded 1, medium sized companies with 100-499 employees were coded 2, and larger companies that have over 500 employees were coded 3.

Health care occupational categories are condensed into four categories for the purpose of this research. A four level nominal variable was created with the categories direct, direct assisting, indirect, and indirect assisting. Corresponding binary variables were also created for each occupational category. Occupations in the direct category include workers that have been referred to as diagnostic providers, such as physicians and surgeons, dentists, and chiropractors. Direct assist occupations include what has been conceptualized as support providers, such as registered nurses, physician assistants, and dental hygienists. Indirect providers have also been conceptualized in this research as support providers, occupations such physical therapists, radiation therapists, and speech pathologists. Indirect assist occupations such as medical and dental assistants are captured in the final category and have been referred to as service providers in this study.

3.2.2.3 Race Models

Independent variables used in the race model include race and ethnicity, minority status based upon income, immigration status, sex, occupational and industry sex segregation indices, marital status, and parental status. The original variable for race was recoded into a five level

nominal variable; white, black, Asian, American Indian or Alaskan native, and other. The Hispanic ethnicity variable was recoded into a binary, 0 indicating non-Hispanic and 1 indicating Hispanic. Together these variables were combined to create the race/ethnicity variable which is a five level nominal variable with the categories, white non-Hispanic, black non-Hispanic, Hispanic, Asian non-Hispanic, and other non-Hispanic. Corresponding binaries were created for each value of the race/ethnicity variable. A binary was also created to indicate disadvantaged minority status based upon analysis of income. White and Asian non-Hispanic individuals are non-minorities (0) which was determined by preliminary examination of income of both groups, Asians as a group earned roughly the same as Whites. Disadvantaged minorities, including black non-Hispanic, Hispanic, and other non-Hispanic individuals were coded 1 based upon income analysis. A binary was created to reflect an individual's immigration status, non-immigrants were coded 0 and immigrants were coded 1.

For the purpose of this research, the sex variable was recoded from a two level nominal variable into a binary variable coding females 1, and males 0. Industry and occupational sex segregation indices were used in this research. For both variables values less than 1 indicated that women were under-represented, values over 1 indicated that women were over-represented, and a value of 1 indicates that men and women were equal. Marital status was recoded from a seven level nominal variable into a three level variable with the following categories: married, ever married, and never married. Binaries were also created for each of the three marital status categories. A binary variable was created to indicate whether the respondent has children under 6, and another binary was created to indicate children under 18.

4. Results

4.1 Univariate and Bivariate Results

4.1.1 Table 1

Table 1(a) is comprised of univariate and bivariate results for the full sample by minority status based upon income of the respondent. The full weighted sample size is 19,693, of that sample 75% are non-minorities and minorities comprise 25% of the sample. The dependent variable income is measured in dollar amounts earned annually. The average annual earnings for the full sample of health care workers is $43,619; non-minorities earn $46,804 and minority respondents earn $34,274 on average. Income differences between groups suggest that minority health care workers earn 73.2% of the wages earned by non-minority health care workers. The two sample t-test results reveal that minority health care workers earn significantly (t-test is significant at .001 level) less than non-minority health care workers, and this difference is substantial with an effect size greater than .20.

The average age of the sample is 40.3 years. Non-minority workers are significantly (t-test significant at .001 level) older at 40.8 years than minority workers at 38.7 years of age, an effect size greater than .20 suggests this difference is substantial. Overall 21.3% of respondents reported having a high school diploma or less. 37% of minority respondents reported attaining a high school diploma or less compared to 15.9% of non-minority respondents. This difference is not only statistically significant but effect size is greater than .20. Of the sample, 27% of non-minority respondents have a bachelor's degree and 18% have advanced degrees. Non-minorities are significantly (t-test significance levels .001) more likely to have a bachelors (27.3%) and advanced degree (18.4%) than the 15.9% of minority workers who have earned a bachelor's degree and 7.9% who have earned an advanced degree. Of the sample 23.8% live in the

Midwest. Minorities (13.3%) are significantly less likely to live in the Midwest than non-minority respondents (27.4%), this finding is not only statistically significant at the .001 level but the effect size is greater than .20 as well. About 16% of the sample lives in an area classified as rural, non-minority health care workers (15.7%) are significantly more likely to live in rural areas than minority health care workers (9.4%).

The full sample works an average of 38 hours per week. Minority health care workers, on average work more hours than non-minority health care workers. Minorities work on average 39.01 hours per week, compared to the 37.74 hours worked by non-minority workers, and this difference is significant at the .001 level. Only 4.8% of respondents were self-employed, and non-minorities are significantly more likely to work for themselves than minorities. About half of the sample works for large companies (50.8%), 16.3% work for medium-sized companies and 32.9% work for small companies. Non-minorities are more likely to work for large companies than minorities, and while this difference is significant the effect size is not substantial. Minorities are more likely to work for medium sized companies than non-minorities, and again the difference is significant but the effect size is not substantial. Non-minorities work in occupations with significantly higher occupational prestige scores, this difference is also substantial at an effect size greater than .20. The average occupational prestige score for the sample of health care workers is 58.51, non-minorities average 59.89 and minority workers average 54.58. Prestige ranking is based on a scale of 0-100, a higher score suggests the occupation is considered more prestigious.

Finally, Table 1(a) provides the distribution of workers in health care occupations. Of the full sample, 8.8% of workers are employed as medical direct providers. Non-minorities (10.3%) are significantly (t-test significance level .001) more likely than minority workers (4.1%) to work

as a medical direct provider. Medical direct assist providers make up 28.5% of the full sample, and 32.2% of non-minorities are employed in this type of occupation compared to 17.8% of minority workers. The difference is significant with t-test significance levels at .001, and substantial as well with an effect size greater than .20. Medical indirect providers make up 30.6% of the providers, and 31.8% of the non-minority respondents are employed in these types of occupations. Medical indirect occupations employ 26.8% of minority respondents and the difference between groups is significant at the .001 level. Of the occupational levels medical indirect assistants make up the largest portion of the sample (32.2%). Minority respondents (51.3%) are much more likely to be employed in these occupations than non-minority respondents (25.7%). This difference is not only significant at the .001 level, but substantial as well as the effect size is greater than .20. This finding supports hypothesis 3(b) that disadvantaged minorities are disproportionately represented in lower-skilled health care occupations.

Table 1(b) includes univariate and bivariate analyses for the independent variables of the race model. The majority of health care workers in this sample are women (81.9%). Analysis suggests that there is a difference between minorities (83.2%) and non-minorities (81.4%) that is statistically significant (at the .01 level) and substantial with an effect size greater than .20. Minority and non-minority respondents both work in sex segregated occupations, with women overrepresented, but minorities experience even higher segregation. The difference is not only statistically significant but also substantial as the effect size is larger than .20.

Overall, 59% of the respondents are married, however significantly more non-minority respondents (64.2%) are married than minority respondents (43.9%), a substantial difference between groups. Of the sample minority respondents are most likely to have never married

(33.2%) as opposed to non-minority respondents (18.9%), the difference is both significant and substantial (t-test significance level .001 and effect size greater than .20). Minority respondents are also significantly more likely to have children under the age of 6 (24%) than non-minority respondents (19.4%). Nearly half of the sample (46.3%) has children under eighteen, 52.7% of minority health care workers and 44.1% of non-minority health care workers. Minorities are significantly (t-test significance level .001) more likely to be immigrants (26.3%) than non-minorities (10.8%), a substantial difference.

4.1.2 Table 2

Univariate and bivariate results for full time and full year workers are provided on Table 2. Many health care occupations offer flexible work schedules and for many employers part time workers are their employee base; therefore it was necessary to look at these categories separately. Table 2(a) is comprised of the independent variables for the individual and structural models. Of the full sample 13,738 individuals are classified as full time full year workers. Comparison of full time full year workers with the full sample illustrates a larger gap (69.9%) in the percentage minority health care workers earn annually versus non-minority health care workers compared to the 73.2% gap of the full sample. Minority respondents who work full time for the entire year earn on average $37,984 in comparison to the $54,351 earned by non-minority respondents. A two sample t-test indicates that among full time workers, non-minority health care workers earn significantly more (significance at .001 level) than minority health care workers with a substantial effect size greater than .20.

The average age of the sample of full time full year workers is 40.9 years. Non-minority workers are significantly (t-test significant at .001 level) older at 41.5 years than minority workers at 39.3 years of age, an effect size greater than .20 suggests this difference is substantial.

Overall 21.8% of the full time full year respondents reported having a high school diploma or less. Approximately 36% of minority respondents reported attaining a high school diploma or less compared to 16.4% of non-minority respondents. This difference is not only statistically significant but meaningful as the effect size is greater than .20. Of the full time full year workers, 27% of non-minority respondents have a bachelor's degree and 19% have advanced degrees. Non-minorities are significantly (t-test significance levels .001) more likely to have a bachelors and advanced degree than the 16.4% of minority workers who have earned a bachelor's degree and 8.4% have earned an advanced degree. Of the full time full year health care workers sampled, 22% live in the Midwest. Minorities (12.5%) are significantly less likely to live in the Midwest than non-minority respondents (25.8%), this finding is not only statistically significant at the .001 level but the effect size is greater than .20 as well. About 16% of the sample lives in an area classified as rural, non-minority health care workers (18.1%) are significantly more likely to live in rural areas than minority health care workers (9.2%).

Only 4.5% of full time full year respondents were self-employed, and non-minorities are significantly more likely to work for themselves than minorities. About half of the sample works for large companies (52.7%), 16.7% work for medium-sized companies and 30.7% work for small companies. Non-minorities are more likely to work for large companies than minorities, and while this difference is significant the effect size is not substantial. Minorities are more likely to work for medium sized companies than non-minorities, and again the difference is significant (at a .01 level) but the effect size is not substantial. Non-minorities work in occupations with significantly higher occupational prestige scores, this difference is also substantial at an effect size greater than .20. The average occupational prestige score for the

sample of full time full year health care workers is 59.03, non-minorities average 60.52 and minority workers average 55.13.

Table 2(a) provides the distribution of full time full year workers in health care occupations. Of the full sample, 9.5% of workers are employed as medical direct providers. Non-minorities (11.5%) are significantly (t-test significance level .001) more likely than minority workers (4.4%) to work as a medical direct provider. Medical direct assist providers make up 28.2% of the sample, and 31.8% of non-minorities are employed in this type of occupation compared to 18.7% of minority workers. The difference is significant with t-test significance levels at .001, and substantial as well with an effect size greater than .20. Medical indirect providers make up 31.8% of the sample, and 33.1% of the non-minority respondents are employed in these types of occupations. Medical indirect occupations employ 28.3% of minority respondents and the difference between groups is significant at the .001 level but not substantial. Of the full time full year health care providers, 30% work in medical indirect assist occupations. Minority respondents (48.6%) are much more likely to be employed in these occupations than non-minority respondents (23.5%). This difference is not only significant at the .001 level, but substantial as well as the effect size is greater than .20. This finding supports hypothesis 3(b) that disadvantaged minorities are disproportionately represented in lower-skilled health care occupations.

Table 2(b) includes univariate and bivariate analyses for the independent variables of the race model. Similar to the full sample, the majority of full time full year health care workers are women (78.9%). 81.5% of minority full time health care workers are women, a minimal difference from the full sample. However, women make up only 77.9% of non-minority health care workers that are full-time full year. The difference between the groups is statistically

significant at the .001 level, but this difference does not appear to be substantial. Minority and non-minority respondents both work in sex segregated occupations, with women overrepresented, but minorities experience even higher segregation. The difference is not only statistically significant but also substantial as the effect size is larger than .20.

Of the full time full year respondents 57.6% are married, however significantly more non-minority respondents (64.8%) are married than minority respondents (44.1%), a substantial difference between groups. Of the sample minority respondents are most likely to have never married (31.8%) as opposed to non-minority respondents (18.4%), the difference is both significant and substantial (t-test significance level .001 and effect size greater than .20). Minority respondents are also significantly more likely to have children under the age of 6 (22.6%) than non-minority respondents (16.5%). Nearly half of the sample (44%) has children under eighteen, 50.8% of minority health care workers and 41% of non-minority health care workers. Minorities are significantly (t-test significance level .001) more likely to be immigrants (26.8%) than non-minorities (12.2%), a substantial difference.

4.1.3 Table 3

Occupational categorical earnings provide a more in-depth look at the income differentials between non-minorities and minorities. Table 3 consists of bivariate analyses of the annual earnings of non-minority and minority health care workers across educational and occupational categories. T-test analysis suggests significant and substantial differences in the earnings between groups. Respondents in the full sample with a high school diploma or less earn $23,574 annually. Non-minority health care workers with a high school diploma or less earn $24,443 and minorities earn $22,477. The difference in terms of annual earnings is significant but not substantial. Non-minority workers with some college earn significantly more ($35,602)

on average than minority workers with some college earn ($31,515), this difference is significant

(at .001 level) and substantial as well. Non-minority health care workers with a bachelors or

advanced degree earn significantly more than minority health care workers, yet the difference

does not appear to be substantial. Comparison of the earnings for each group by occupational

category reveals that non-minority health care workers who provide indirect care earn more

($39,677) than minority health care workers in the same category ($35,839). Analysis suggests

that this difference is not only statistically significant at the .001 level, but substantial with an

effect size greater than .20. Similar analysis of workers in the indirect assist occupational

category yields similar results, non-minority health care workers earn on average $23,407

annually, while minority workers earn $21,429. The difference between the two groups in the

medical indirect assist occupational category is also statistically significant (at .001 level) and

substantial as well. Bivariate tests do not show a significant or substantial difference between

non-minorities and minorities in the medical direct or medical direct assist categories.

4.2 Multivariate Results

Regression analysis for the full sample indicates that according to the adjusted R square,

64.3% of the variation of the dependent variable income is explained jointly by the independent

variables in the model. Results in the full sample regression (Table 4) suggest that net of other

factors, minorities make $3,026 less than non-minorities per year, and this finding supports

hypothesis 3(a). At the individual level, age, education and geographical location can

significantly predict the variations of income. OLS analysis suggests a non-linear relationship

between income and age (see Figure 1). Hypothesis 1(a) is somewhat supported by this finding

as detailed on Table 4, earnings increase as one ages, until reaching a plateau typically before

retirement, at which time earnings begin to decline. Those with an advanced college degree

(masters degree or higher) earns $18,981 more per year than someone with a high school diploma or less. Individuals with a bachelor's degree would earn $9,322 more than individuals with a high school diploma or less. Those with some college can expect to earn $4,421 more annually than workers with a high school diploma or less. These findings shown on Table 4 lend support to hypothesis 1(b), that net of other factors as years of education increase income will increase. Living in the Midwest would result in $1,995 less per year than those living in other regions of the United States. Living in a rural area also predicts a decrease of income by $3,255 per year.

Structural level factors that can significantly predict the dependent variable include annual hours worked, employment with the government, self-employment status, working for a large company, and occupational category. Self-employed health care workers earn $8,700 more per year than those not self-employed. According to the regression analysis for the full sample, working for a large company would result in $3,307 more per year than working for a medium sized company, which was used as a reference group in this analysis. Results from this analysis provided on Table 4 supports hypothesis 2(a), that net of other factors employment in a large organization increases annual earnings.

Income is predicted also by the occupational category in which an individual is employed. Working as a medical direct provider would result in $53,580 more annually than working in a medical indirect assist occupation. Individuals working in medical direct assist occupations would earn $20,152 more annually than those working in medical indirect assist occupations. Finally, those working in medical indirect occupations would earn $6,753 more annually than workers in medical indirect assist occupations. These findings supports hypothesis 2(b), that net of other factors higher skilled occupations increase wages.

At the race level, in addition to minority status already discussed, sex and occupation sex segregation significantly predict the variations of income. Women earn $6,156 less annually than men in health care occupations. Regression analysis of the full sample suggests that occupational sex segregation accounts for $6,692 less per year of income. Since most health care occupations are segregated by sex the regression coefficients are unusually large.

Due to the interaction effects between the variable minority and other independent variables, the sample was split into two groups using the main independent variable minority status. Separate regression analyses are conducted using both the minority group data and the non-minority data. Comparing the models in separate regression analysis provides stable coefficients for the independent variables while decreasing multicollinearity.

Variations of income for both models significantly predicted at the individual level include age, education and rural residency. Each year aged for non-minorities yields $341 more in annual income, and minorities earn $191 more for each year. The difference across models is statistically significant according to a modified chow test. Non-minorities with an advanced degree make $20,150 more than non-minorities without a high school diploma, whereas minorities with an advanced degree make $14,480 more than minorities without a high school diploma. The difference across models is statistically significant according to a modified chow test. Non-minorities with some college make $5,093 more than their counterparts with a high school diploma or less, whereas minorities with some college make $3,258 more than minorities with a high school diploma or less. The difference across models according to a modified chow test is statistically significant. Living in a rural area results in $3,076 less annual income for non-minorities compared to non-minorities living in urban areas, and $3,692 less for minorities

living in urban areas. A modified chow test did not indicate that the difference between the non-minority and minority model is significant.

At the structural level hours worked, self-employment, company size, and occupational category have significant coefficients in both non-minority and minority models. Non-minorities earn $18 more for hours worked, whereas minority health care workers earn $11. A modified chow test indicates this difference is statistically significant across models. Self-employment results in an increased income of $8,601 for non-minority health care workers, and $7,412 for minority health care workers, however the difference between models is not statistically significant according to a modified chow test. Non-minorities working for a large business earn $3,748 more annually than non-minorities working for medium sized businesses. Minority health care providers working at a large organization earn $2,122 more annually than minority health care providers working for medium sized organizations. A modified chow test indicates the difference between the models is not statistically significant.

Non-minority medical direct care providers earn $51,377 more annually than non-minority medical indirect assist providers. Minority medical direct care providers earn $63,995 more annually than minority medical indirect assist providers. A modified chow test indicates that the difference between the two models is statistically significant. Non-minorities working in medical direct assist occupations earn $19,590 more annually than non-minority medical indirect assist providers. Minority medical direct assist providers earn $21,670 more annually than minority medical indirect assist providers. Analysis indicates that the difference between the two models is statistically significant. These findings support hypothesis 2(b), that net of other factors working in higher skilled occupations increases earnings, particularly for members of disadvantaged minority groups.

Race level factors with significant coefficients in both models are sex and occupational sex segregation index. Non-minority female health care workers earn $6,655 less annually than non-minority men, and minority women earn $4,627 less than minority men, which indicates that being female penalizes income more for non-minority women. Analysis indicates that the difference between the models is statistically significant. Occupational sex segregation index indicates that non-minority health care workers in sex segregated jobs earn $6,594 less per year, and minorities earn $5,841 less annually, however the difference between the models is not statistically significant.

Figure 2 is the share of unique variance explained. For the full sample, unique variance of the individual segment accounts for 16.64% of the total unique variance, the structural segment accounts for 80.13%, and the race segment accounts for 3.44%. The total shared variance of the models is .452. Partitioning the models revealed that the individual segment's unique variance share decreased for the non-minority model (12.73%) and increased for the minority model (17.6%). This is likely because minorities experience increased opportunities and returns on investment in human capital compared to other minorities. Structural factors explain the majority of income differentials between non-minority and minority health care workers in the saturated model. However, when models are partitioned structural factors explain more of the dependent variable for the non-minority model (84.99%) than the minority model (79.68%). The race segment decreases share of variance for the non-minority model (2.28%) and for the minority model (2.73%) as well.

5. Conclusion

5.1 Discussion

Analysis indicates that hypothesis 1(a) of the individual model is somewhat supported, with age income increases until flattening out and eventually declining. Age is used as a proxy for experience in this project. Both non-minorities and minorities experience an increase in annual earnings with age, however there is a significant difference between non-minorities and minorities. A possible explanation for this is that minorities are not rewarded the same as non-minorities for experience. Another possible explanation suggested by previous research is that women and minorities are more likely to experience career interruptions than white men (Brown and Jones, 2004) and this is reflected in annual earnings.

OLS regression analysis indicates that hypothesis 1(b) of the individual model is supported, net of other factors increased education results in increased income. This finding supports theories of human capital, that individuals' income is a reflection of their investment in education (Becker, 1992). Although regression analysis findings do not suggest a significant difference in earnings between non-minorities and minorities with a bachelor's degree, there were significant differences between those with some college and advanced degrees. These results support theoretical positions that investment in education by individuals is rewarded (in this case in terms of income) equitably because the cost of the investment is absorbed by the individual rather than the organization (Mincer, 1962). However, this finding also supports Mincer's (1962) suggestion that employers have incentive to be selective about which employees they invest in with on the job training, perhaps reflecting structural bias.

Analysis supports hypothesis 2(a), that net of other factors employment in a large organization results in increased wages. Half of the full sample works in large organizations,

characterized as having more than 500 employees. Health care workers employed in large

organizations earn $3,307 more annually than those employed in medium sized organizations.

This finding supports previous research suggesting that core (large) sectors compensate labor

pools differently (Noyelle, 1987). Large organizations have high profit margins and can afford

to pay more competitive wages. Presumably, many of these large organizations are the large

national health care systems that White (2007) identifies. There does not appear to be a

significant difference in earnings between non-minorities and minorities working in large

organizations, an indication that income may be determined more by occupational position than

company size.

Hypothesis 2(b) of the structural model is supported, that net of other factors employment

in higher skilled occupations increases wages. Those working in the secondary labor market in

positions (medical indirect assist) such as home health care aid and certified nursing assistant

earn significantly less than occupations in primary labor markets. The average annual earnings

of the full sample in medical indirect assist occupations is $22,605 compared to the full sample

of health care workers who earn on average $43,619 annually. This finding lends support to

McDonald and Solow's (1985) findings suggesting that primary jobs are filled by specialized

individuals earning higher than average wages. Just over 30% of the sample works in

occupations in the secondary labor market, and over half of disadvantaged minorities are

employed in these positions. Thus, the current study supports prior research findings that

minorities and women are over-represented in the secondary labor market (Duffy, 2007; Gabard,

2007).

Hypotheses of the race model are supported by analysis. Both hypothesis 3(a) net of other

factors disadvantaged minorities have lower incomes than non-minorities, and hypothesis 3(b)

that minorities are disproportionately represented in lower-skilled health care occupations are supported. Disadvantaged minorities earn less than non-minorities at all educational and occupational levels. The non-minority model suggests that 64.1% variance in the dependent variable income is explained jointly by the independent variables, and for the minority group 61.9% of the variance is explained. Such difference in explained variance suggests the existence of another variable, such as discrimination influences income. This study corroborates previous research documenting racial income disparities in health care occupations (Duffy, 2007; Gabard, 2007; Glen, 1987; Queneau, 2006; Weeks and Wallace, 2006). Disadvantaged minorities employed in the health care industry are disproportionately employed in occupations that are lower-skilled, low paying and physically taxing. The results from this study support occupational segregation and sorting theories (Figart and Bergman, 1989; Reskin and Cassiere, 1996, Reskin and Roos, 1990, Tomaskovic-Devey, 1993). One possible explanation of this practice is rooted in occupational recruitment. Medical indirect assist occupations, such as certified nursing assistants, make up a large proportion of employed medical staff working for nursing homes and home health care agencies (Watson, 2007). As the need for care providers continues to grow the recruitment for semi-skilled and semi-professional workers also increases. Previous research has linked this recruitment of lower and semi-skilled healthcare workers to welfare reform and the increasing professionalization of nursing (Filinson, Cone, Ray, 2005; Glazer, 1991).

5.2 Limitations

Due to the use of secondary data for this study there are limitations. CPS data is cross-sectional rather than longitudinal, meaning that the variables are measured at one point in time and very little information is available about the context of the variables. Because of this

limitation it is difficult to determine the positions obtained through on the job training, performance based promotions, or management experience. Another limitation of this study is the health care worker occupational categories. Some members of occupational categories may be "grandfathered" in despite increased educational and training requirements for that occupation today, and the CPS does not capture this information.

Another limitation of this study is the inclusion of Asian Americans in the non-minority category for analysis. Considering a group as a non-minority that has historically experienced oppression and discrimination in the United States is debatable. Prior research influenced the coding of this variable. Literature supports using social context in conjunction with other factors, such as income, to develop the disadvantaged minority status. As mentioned in the methods section, preliminary analysis suggested that Asian health care workers in the sample earned on average roughly the same as Whites.

5.3 Policy Implications

Educational institutions struggle with recruitment and retention of disadvantaged minorities in professional health care programs (AAMC Report, 2008; Queneau, 2006; Villarruel, 2002). Initiatives that aim to increase minority representation in the professional health care provider pipelines overlook the concentration of minorities already employed in the semi-professional occupations. The earnings gap between non-minorities and disadvantaged minorities wanes with an increase in education, yet this wage gap persist for those with some college or advanced degrees. Medical innovation and technology has increased the demand for a well educated and trained workforce, and in many cases providers are attaining advanced degrees to remain competitive. Increased demand for health care services combined with the need for a

leading edge workforce suggests that education alone is not a panacea for labor shortages or wage inequalities.

In the past a shortage of nurses encouraged corporations to partner with educational institutions to offer program completion and training opportunities to their employees who lacked a degree or were uncertified (Gillespie, 1999). Several states faced labor shortages in the 1990's, and with support from the Robert Wood Johnson Foundation disadvantaged minorities working in entry and mid-level positions in hospitals and nursing homes enrolled in the "Ladders in Nursing Care" (Gillespie, 1999). The goal of the program was to increase the number of RN's by training the existing workforce. While the program was considered a success, following the dissolution in 1998 several challenges were apparent (Gillespie, 1999). The final report indicated that mergers, downsizing, and restructuring of health care organizations dissuaded administrators from committing funds for training employees who may not be needed in a year or two (Gillespie, 1999). Furthermore as health care providers in general became more specialized, nurses included, registered or general nurses experienced a decline of demand and opportunity. Primary employers such as hospitals and major health care organizations began requiring a bachelor's degree for nurses and other specialized providers as technology rapidly advanced requiring more training and education. For a brief period disadvantaged minorities were given the opportunity to climb the ladder, in nursing at least, and hold positions that were socially and economically rewarded. Health care occupations offer very few opportunities to "work your way up the ladder", so that partnerships between corporations and educational institutions to identify and re-train minorities already employed in health care services deserve more consideration. The sorting process into occupations begins long before an individual reaches working or college age, and is perhaps best addressed at the high school or even middle

school level. The increasing demand for health care professionals should be a source of stable employment with livable wages, and hopefully this demand translates into opportunities for equality and advancement rather than reproducing existing inequalities.

A cause for concern documented by feminist researchers is the recruitment of disadvantaged minorities to abate the shortage of long term care workers (Dodson and Zincavage, 2007; Watson, 2007). As Dodson and Zincavage (2007) point out, exploitation of minority nursing home workers is multi-faceted and rooted in historical stereotypes of minority women being suited for low compensated caretaking work. In a survey of CNAs, most of which are women and half are minorities, nearly 1/3 received some form of public assistance (Squillace, Remsburg, Harris-Kojetin, Bercovitz, Rosenoff, and Han, 2009). Glazer (1991) provided a theoretical framework of the legitimization of nursing as a profession within a capitalistic and stratified environment. The actions taken by nursing organizations in order to attain higher wages, prestige, and professionalization resulted in re-organizing power structures and further subordinating working class and minority women (Glazer,1991). Increased wages and the recruitment of men to meet our nation's growing health care demands would improve the occupational distribution of workers.

Policy makers recognize the importance of minority representation in professional health care occupations (AAMC Report, 2008). The health of a community depends upon having access to care providers, and this access extends beyond geographic and financial perimeters. Patients and communities benefit when providers have a cultural literacy of the populations that they serve. Cultural literacy can include bilingualism, but is also far more complex. For certain populations this can include understanding a general distrust of providers, such as the case with many African Americans. Cultural literacy can also include understanding social factors that can

influence health, such as lack of transportation or flexible office hours, all of which can be an obstacle in seeking preventative care. Gabard (2007, p. 166) identified positive effects of a diverse health care workforce. Cultural competence enhances communications between providers and patients, which allows practitioners to collect more relevant patient information and encourages patients to seek services sooner and follow recommendations (Gabard, 2007). A racially stratified health care workforce has far-reaching effects extending beyond labor and economic inequalities to exigent public health consequences.

This study examined the income disparities and distribution of disadvantaged minority health care workers. All of the hypotheses tested were supported, and this research contributes to the growing body of literature on the effects of a stratified health care workforce. It is unlikely that we will see a decrease in the need for health care providers, at all occupational levels. Long term care providers who work in institutions and provide services to patients at home are also likely to be in demand. Such providers will become increasing necessary as families become dependent on assisted care. More research is needed to direct attention to the discrepancies in earnings and occupational distribution of workers that is clearly related to race, class, and gender.

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APPENDIX

Table 1A

Values for Full Sample By Minority

Variables:	Full Sample	Non-Minority	[1] [2]	Minority	
Dependent Variable:					(pay gap)
Annual Earnings (mean)	$43,619	$46,804	*** ^	$34,274	73.2%
Annual Earnings (median)	$35,000	$38,000		$27,000	71.1%
Annual Earnings Centile	49%	52%		40%	
(stddev)	(34,342)	(35,875)		(27,326)	
Independent Variables:					
Individual-Level Factors:					
Age (years)	40.3	40.8	*** ^	38.7	
	(11.9)	(12.0)		(11.4)	
% High School Diploma or less (0,1)	21.3%	15.9%	*** ^	37.0%	
	(.409)	(.366)		(.483)	
% Some College (0,1)	38.5%	38.3%		39.1%	
	(.487)	(.486)		(.488)	
% BA/BS (0,1)	24.4%	27.3%	*** ^	15.9%	
	(.430)	(.446)		(.366)	
% Advanced Degree (0,1)	15.7%	18.4%	*** ^	7.9%	
	(.364)	(.388)		(.270)	
% Midwest (0,1)	23.8%	27.4%	*** ^	13.3%	
	(.426)	(.446)		(.340)	
% Rural (0,1)	15.7%	17.8%	*** ^	9.4%	
	(.364)	(.383)		(.292)	
Structural-Level Factors:					
Annual Hours Worked (mean)	1,893	1,876	***	1,945	
	(597.2)	(606.5)		(566.0)	
Annual Hours Worked (median)	2,080	2,080		2,080	
Hours Per Week (mean)	38.08	37.74	***	39.10	
	(10.2)	(10.5)		(9.4)	
Works Full Time Weekly	78.3%	76.1%	*** ^	84.9%	
	(.412)	(.427)		(.358)	
% Government (0,1)	11.6%	11.3%		12.2%	
	(.320)	(.317)		(.328)	
% Self-employed (0,1)	4.8%	5.6%	***	2.6%	
	(.214)	(.229)		(.161)	
% Work at Small Co. (0,1)	32.9%	32.5%		33.9%	
	(.470)	(.468)		(.474)	
% Work at Medium Co. (0,1)	16.3%	15.6%	***	18.3%	
	(.369)	(.363)		(.387)	
% Work at Large Co. (0,1)	50.8%	51.9%	***	47.7%	
	(.500)	(.500)		(.500)	
Occupational Prestige	58.5	59.9	*** ^	54.6	
	(10.65)	(10.53)		(10.01)	
% Direct (0,1)	8.8%	10.3%	*** ^	4.1%	
	(.283)	(.305)		(.199)	
% Direct Assist (0,1)	28.5%	32.1%	*** ^	17.8%	
	(.451)	(.467)		(.382)	
% Indirect (0,1)	30.6%	31.8%	***	26.8%	
	(.461)	(.466)		(.443)	
% Indirect Assist (0,1)	32.2%	25.7%	*** ^	51.3%	
	(.467)	(.437)		(.500)	
Sample n (weighted):	19,693	14,687		5,006	
	100%	74.6%		25%	

[1] = *** p < 0.001; ** p < 0.01; * p < 0.05
[2] = ^ effect size greater > .20

Table 1B

Values for Full Sample By Minority

Variables:	Full Sample	Non-Minority	[1]	[2]	Minority
Race Factors:					
% Female (0,1)	81.9%	81.4%	**	^	83.2%
	(0.385)	(0.389)			(0.374)
Occupational Sex-Segregation	1.739	1.715	***	^	1.807
	(0.394)	(0.417)			(0.306)
% Married (0,1)	59.0%	64.2%	***	^	43.9%
	(0.492)	(0.479)			(0.496)
% Ever Married (0,1)	18.4%	16.9%	***	^	23.0%
	(0.388)	(0.375)			(0.421)
% Never Married (0,1)	22.5%	18.9%	***	^	33.2%
	(0.418)	(0.392)			(0.471)
% With Children Under 6 (0,1)	20.6%	19.4%	***		24.0%
	(0.404)	(0.395)			(0.427)
% With Children Under 18 (0,1)	46.3%	44.1%	***	^	52.7%
	(0.499)	(0.497)			(0.499)
% Immigrant (0,1)	14.7%	10.8%	***	^	26.2%
	(0.354)	(0.311)			(0.440)
Sample n (weighted):	19,693	14,687			5,006
	100%	74.6%			25%

[1] = *** p < 0.001; ** p < 0.01; * p < 0.05
[2] = ^ effect size greater > .20

Table 2A

Values for Full Time Full Year Workers By Minority

Variables:	Full Sample	Non-Minority	[1]	[2]	Minority	
Dependent Variable:						(pay gap)
Annual Earnings (mean)	$49,802	$54,351	***	^	$37,984	69.9%
Annual Earnings (median)	$40,000	$45,000			$30,000	66.7%
Annual Earnings Centile	56%	60%			45%	
(stddev)	(35,657)	(37,264)			(27,816)	
Independent Variables:						
Individual-Level Factors:						
Age (years)	40.9	41.5	***	^	39.3	
	(11.5)	(11.6)			(11.2)	
% High School Diploma or Less (0,1)	21.8%	16.4%	***	^	35.8%	
	(0.413)	(0.370)			(0.479)	
% Some College (0,1)	37.6%	36.8%	**		39.5%	
	(0.484)	(0.482)			(0.489)	
% BA/BS (0,1)	24.1%	27.1%	***	^	16.4%	
	(0.428)	(0.445)			(0.370)	
% Advanced Degree (0,1)	16.5%	19.7%	***	^	8.4%	
	(0.372)	(0.398)			(0.278)	
% Midwest (0,1)	22.1%	25.8%	***	^	12.5%	
	(0.415)	(0.437)			(0.331)	
% Rural (0,1)	15.6%	18.1%	***	^	9.2%	
	(0.363)	(0.385)			(0.289)	
Structural-Level Factors:						
Annual Hours Worked (mean)	2182	2187	*		2170	
	(374.9)	(376.3)			(371.0)	
Annual Hours Worked (median)	2080	2080			2080	
Hours Per Week (mean)	42.0	42.1	*		41.7	
	(7.21)	(7.24)			(7.13)	
% Government (0,1)	12.8%	12.5%			13.6%	
	(0.334)	(0.330)			(0.342)	
% Self-employed (0,1)	4.5%	5.4%	***	^	2.3%	
	(0.208)	(0.226)			(0.151)	
% Work at Small Co. (0,1)	30.7%	30.2%	*		32.0%	
	(0.461)	(0.459)			(0.467)	
% Work at Medium Co. (0,1)	16.7%	16.2%	**		18.0%	
	(0.373)	(0.368)			(0.384)	
% Work at Large Co. (0,1)	52.7%	53.7%	***		50.0%	
	(0.499)	(0.499)			(0.500)	
Occupational Prestige	59.0251	60.5232	***	^	55.1323	
	(10.82)	(10.69)			(10.18)	
% Direct (0,1)	9.5%	11.5%	***	^	4.4%	
	(0.294)	(0.319)			(0.205)	
% Direct Assist (0,1)	28.2%	31.8%	***	^	18.7%	
	(0.450)	(0.466)			(0.390)	
% Indirect (0,1)	31.8%	33.1%	***		28.3%	
	(0.466)	(0.471)			(0.450)	
% Indirect Assist (0,1)	30.5%	23.5%	***	^	48.6%	
	(0.460)	(0.424)			(0.500)	
Sample n (weighted):	13,738	9,920			3,818	
	100%	72%			28%	

[1] = *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$
[2] = ^ effect size greater > .20

Table 2B

Values for Full Time Full Year Workers By Minority

Variables:	Full Sample	Non-Minority	[1] [2]	Minority
Race:				
% Female (0,1)	78.9%	77.9%	***	81.5%
	(0.408)	(0.415)		(0.388)
Occupational Sex-Segregation	1.7228	1.6932	*** ^	1.7996
	(0.409)	(0.437)		(0.314)
% Married (0,1)	57.6%	62.8%	*** ^	44.1%
	(0.494)	(0.483)		(0.497)
% Ever Married (0,1)	20.3%	18.8%	***	24.1%
	(0.402)	(0.391)		(0.428)
% Never Married (0,1)	22.1%	18.4%	*** ^	31.8%
	(0.415)	(0.387)		(0.466)
% With children under 6 (0,1)	18.2%	16.5%	*** ^	22.6%
	(0.386)	(0.371)		(0.418)
% With children under 18 (0,1)	43.7%	41.0%	*** ^	50.8%
	(0.496)	(0.492)		(0.500)
% Immigrant (0,1)	16.2%	12.2%	*** ^	26.8%
	(0.369)	(0.327)		(0.443)
Sample n (weighted):	13,738	9,920		3,818
	100%	72.2%		28%

[1] = *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$

[2] = ^ effect size greater > .20

Figure 1
Median Annual Earnings of Full Sample by Age Cohort
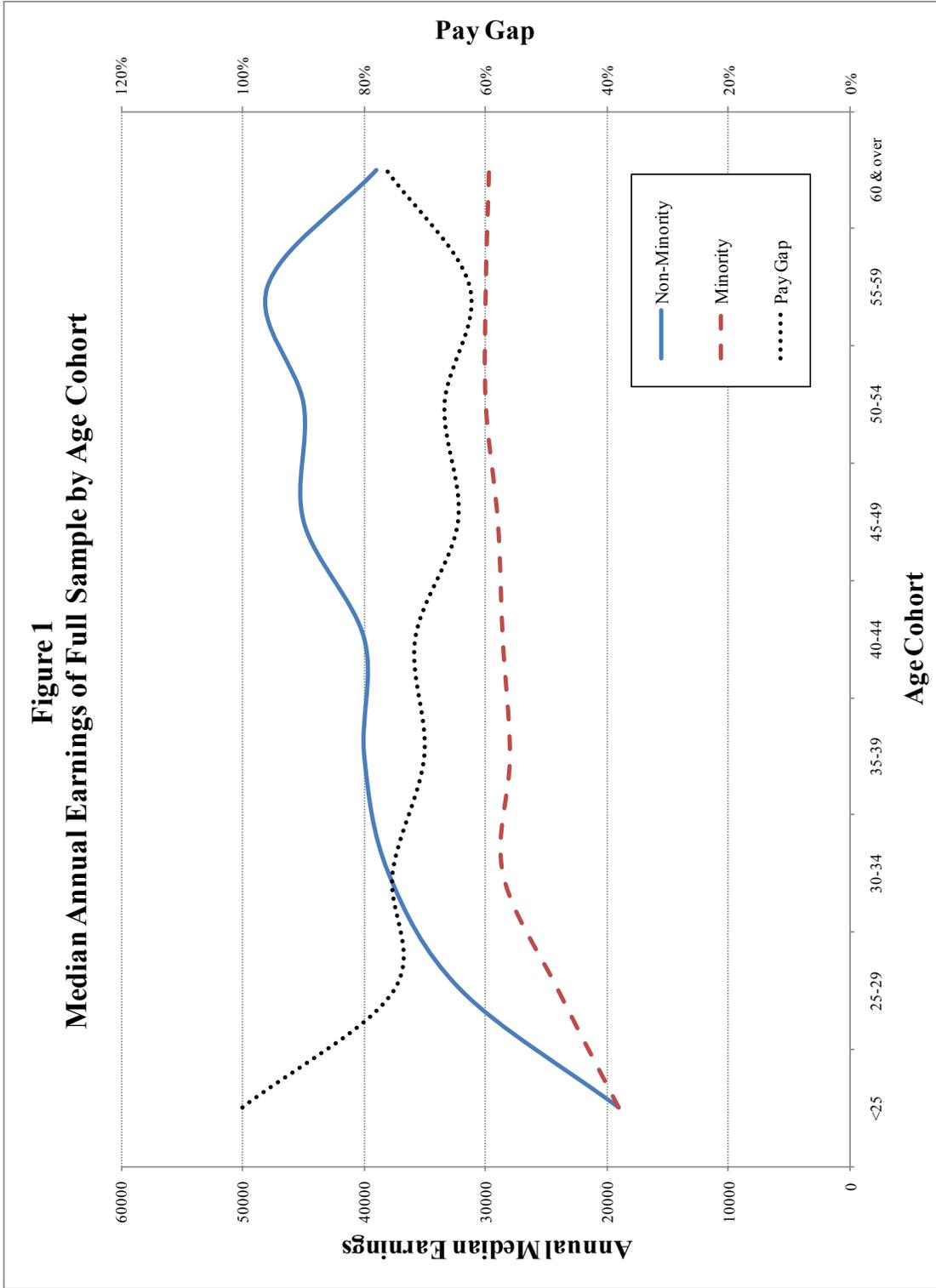
Table 3

Average Annual Earnings by Occupation and Education

Variables	Full Sample	Non Minority	Minority	Full Sample	% of all non minorities	1 2	% of all minorities	Full Sample	Non Minority	1 2	Minority	Pay Gap
				(100%)	(100%)		(100%)					
Education												
High School Diploma or Less	4,194	2,341	1,853	21.3%	15.9%	*** <	37.0%	$23,574	$24,443	***	$22,477	92.0%
Some College	7,588	5,628	1,960	38.5%	38.3%		39.1%	$34,546	$35,602	*** <	$31,515	88.5%
BA/BS	4,810	4,014	796	24.4%	27.3%	*** <	15.9%	$48,843	$49,322	**	$46,428	94.1%
Advanced Degree	3,101	2,704	397	15.7%	18.4%	*** <	7.9%	$84,822	$85,743	**	$78,556	91.6%
Occupation												
Direct	1,725	1,519	206	8.8%	10.3%	*** <	4.1%	$112,701	$112,828		$111,766	99.1%
Direct Assist	5,610	4,721	889	28.5%	32.1%	*** <	17.8%	$51,266	$51,301		$51,083	99.6%
Indirect	6,017	4,676	1,341	30.6%	31.8%	***	26.8%	$38,822	$39,677	*** <	$35,839	90.3%
Indirect Assist	6,340	3,770	2,570	32.2%	25.7%	*** <	51.3%	$22,605	$23,407	*** <	$21,429	91.6%

[1] = *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$

[2] = ^ effect size greater > .20

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Table 4

OLS Regression Analysis for the Income Determination Model

(Dependent variable = annual earnings)

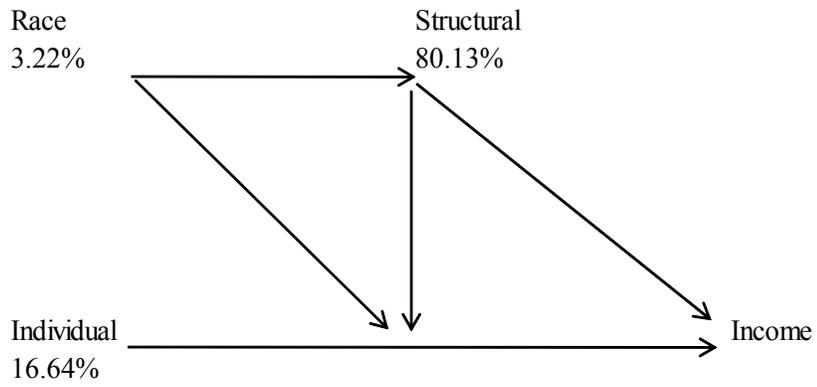| Variables	Full Sample			Non-Minority				Minority		
	unstd.	[1]	std	unstd.	[1]	std.	[2]	unstd.	[1]	std.
Independent Variables:										
Individual Level Factors:										
Age	$301	***	0.104	$341	***	0.114	^	$191	***	0.080
Age Squared	-$9	***	-0.038	-$12	***	-0.046		-$3		-0.013
High School Diploma or Less(0,1)										
Some College (0,1)	$4,421	***	0.063	$5,093	***	0.069	^	$3,258	***	0.058
BA/BS (0,1)	$9,322	***	0.117	$9,793	***	0.122		$9,087	***	0.122
Advanced Degree (0,1)	$18,981	***	0.201	$20,150	***	0.218	^	$14,480	***	0.143
Midwest (0,1)	-$1,995	***	-0.025	-$2,077	***	-0.026		-$1,021		-0.013
Rural (0,1)	-$3,255	***	-0.034	-$3,080	***	-0.033		-$3,757	***	-0.040
Structural Level Factors:										
Annual Hours Worked	$17	***	0.289	$18	***	0.308	^	$11	***	0.237
Government (0,1)	-$1,358	**	-0.013	-$2,196	***	-0.019		$1,400		0.017
Self-employed (0,1)	$8,700	***	0.054	$8,601	***	0.055		$7,412	***	0.044
Small Business (0,1)	$450		0.006	$956		0.012		-$715		-0.012
Medium Business (0,1)										
Large Business (0,1)	$3,307	***	0.048	$3,748	***	0.052		$2,122	**	0.039
Direct (0,1)	$53,580	***	0.441	$51,377	***	0.436	^	$63,995	***	0.465
Direct Assist (0,1)	$20,152	***	0.265	$19,590	***	0.255	^	$21,670	***	0.303
Indirect (0,1)	$6,753	***	0.091	$6,378	***	0.083		$7,793	***	0.126
Indirect Assist (0,1)										
Race Factors:										
Minority (0,1)	-$3,026	***	-0.038							
Female (0,1)	-$6,156	***	-0.069	-$6,655	***	-0.072	^	-$4,627	***	-0.063
Occ Sex Seg	-$6,692	***	-0.077	-$6,594	***	-0.077		-$5,841	***	-0.065
Married (0,1)	$475		0.007	$335		0.004		$919		0.017
Ever Married (0,1)										
Never Married (0,1)	$16		0.000	$81		0.001		-$303		-0.005
Children Under 6 (0,1)	$977	*	0.011	$1,550	**	0.017		-$342		-0.005
Children Under 18 (0,1)										
Immigrant (0,1)	$555		0.006	$902		0.008		$351		0.006
Constant	-$2,372			-$6,787	***			$5,974	*	
Adjusted R-sq.	0.643	***		0.641	***			0.619	***	

[1] = *** p < 0.001; ** p < 0.01; * p < 0.05

[2] = signficant difference between non-minorities and minorities at the .05 level

Figure 2
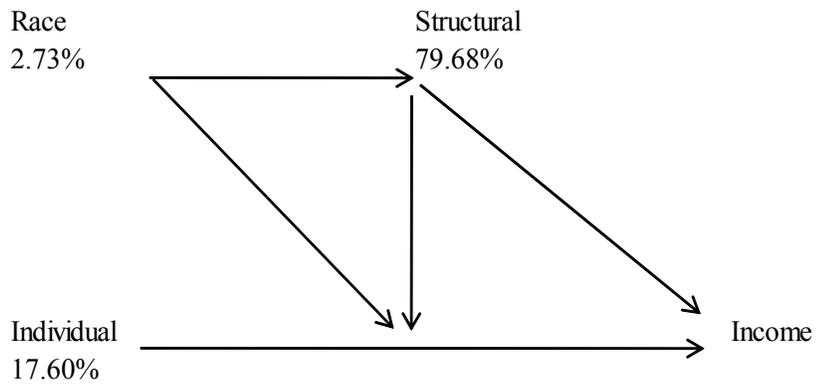**Shares of Unique Variance Explained**

Full Sample

Race
3.22%

Structural
80.13%

Individual
16.64%

Income

(adapted from Wright, 1992)

Non-Minorities

Race
2.28%

Structural
84.99%

Individual
12.73%

Income
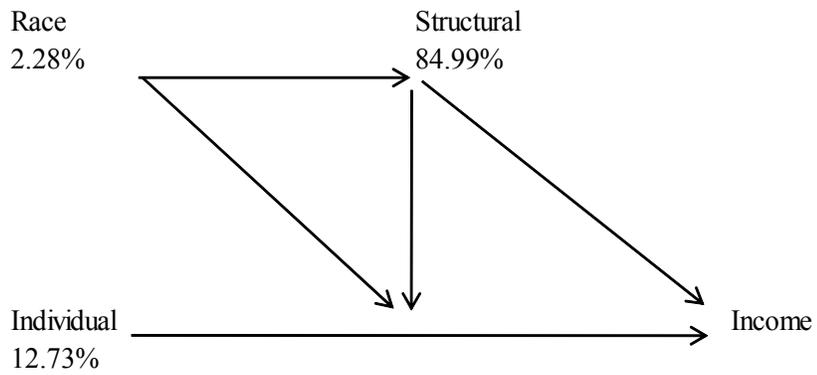
(adapted from Wright, 1992)

Minorities

Race
2.73%

Structural
79.68%

Individual
17.60%

Income

(adapted from Wright, 1992)