COMPONENTS AND DIFFERENCES IN THE INCOME OF
MALE AND FEMALE EDUCATORS

A Thesis by

Craig Daniel Rager Seals

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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 requirements for the degree of Master of Arts with a major in Sociology.

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Kathleen Perez, Committee Chair

_____
Lisa Thrane, Committee Member

_____
Mark Vermillion, Committee Member

DEDICATION

To my wife Anastasia, my parents Thomas and Kathy, my sisters Elizabeth, Alexandra, and Sarah, and the rest of my friends and family.

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ABSTRACT

This research examined some of the factors that help explain the variance in income between male and female educators. Data from the Current Population Survey (CPS) was used to examine some of the components that determine income for teachers at the elementary/middle school, secondary, and postsecondary level, as well as educational administrators. Educational attainment and experience were found to be factors that influenced both male and female incomes. Also, both the crowding hypothesis and the glass escalator were found to account for part of the pay gap between men and women. Also, when all factors were equal, men were still found to have higher incomes than women. Although the pay gap between men and women has closed in recent years, the results here showed that there are still some factors contributing to this pay gap that need to be addressed in order for the gap to close.

TABLE OF CONTENTS

LIST OF TABLES

CHAPTER 1

INTRODUCTION

In 1969, for full-time full-year workers, the median income of women was only 58.6 percent of the median income for men (U.S. Census Bureau, 2009). The pay gap between men and women has decreased in size in the intervening years, but it still exists. In 2008 women were paid 76.8 percent of what men were paid (U.S. Census Bureau, 2009). Although progress has been made in regards to equal pay for men and women, to eliminate the wage gap changes must still be made. It is important to see what factors play a role in creating this gender pay gap, in order to know more specifically what can be done to correct this problem.

Many factors influence the income of individuals. For this study, literature was reviewed that examined both individual level and structural level theories that address the pay gap between men and women. Educational attainment, work experience, and other forms of human capital were reviewed in various fields of study. Also reviewed were other theories such as the glass ceiling, the glass escalator, and the crowding hypothesis that affect the structure of the workplace. Sex, as a distinct and separate variable, was also examined to see what affect it had by itself on the income of individuals.

This research study will focus specifically on the pay gap among teaching and administrative positions in the education field. The literature review examined some literature specifically on these positions, but also reviewed literature on various other occupations. Although the professions are different, the various explanations for the pay gap in other professions could be relevant and, therefore, considered in regard to those within education.

CHAPTER 2

LITERATURE REVIEW

Individual – Income

There are different individual factors that can have an affect on one's salary. Much of the research uses the phrase "human capital" to refer to these factors. Becker (1964) was one of first to use the phrase human capital to describe the individual attributes a person has to contribute to work. Investments in human capital could include various forms of self-improvement such as education, on-the-job training, or even migrating in order to find work (Becker, 1964). These investments in human capital were meant to improve skills and knowledge, which in turn led to individuals being able to make more money (Becker, 1964). Although Becker's (1964) focus was on educational attainment, there are other factors under human capital to be considered with regard to one' income.

Broyles (2009) examined the gender pay gap of chemists to find possible explanations, and human capital factors played a significant role in the explanation. Using data from the American Chemical Society (ACS), Broyles (2009) was able to examine the income factors of 22,081 of the enrolled ACS members. Results showed that 17 percent of the pay gap was due to discrimination or other unmeasured factors (Broyles, 2009). However, 83 percent was due to differences in productive characteristics, such as levels of experience and education, work function (such as management, working in a lab, or another type of research), and employer (aerospace, plastics, and other areas of work for chemists) (Broyles, 2009). Discrimination may exist, according to the study, where two workers with equal endowments or qualifications receive different wages (Broyles, 2009). Although there was a small percentage (17 percent) that

could possibly be considered discrimination, much of the pay gap was due to the other factors mentioned above that can be considered on the individual level (Broyles, 2009).

Even if sex explains part of the pay gap, it is not always the main explanation. Noonan, Corcoran, and Courant (2005) looked at the gender gap in lawyers' earnings. In the cohorts examined, men were found to earn 52 percent more than women, 17 percent more than women with similar characteristics, and 11 percent more than women with both similar characteristics as well as being in the same job setting (Noonan et. al., 2005). There was a large difference in the hours worked between sexes over time, and this was a significant reason for the pay gap (Noonan et. al., 2005). Morgan and Arthur (2005) also found this to be the case. The 1993 National Survey of College Graduates (NSCG) and the 1991 Practice Patterns of Young Physicians (PPYP) were used to measure the pay penalty for women in regards to hours worked (Morgan and Arthur, 2005). Their study measured differences in earnings as a dependent variable and number of hours worked as an independent variable (Morgan and Arthur, 2005). Both data sets showed that the pay penalty for women was greater when hours worked was put into the equation, with a 3 percent difference in the NSCG data, and an 11.2 percent difference in the PPYP data (Morgan and Arthur, 2005).

Educational attainment is another individual level variable that also appears to have an affect on income. Montgomery and Powell (2003) used the people who registered for the GMAT between June 1990 and March 1991 to compare the gender wage gap between those with an MBA and those without an MBA. This data set provided them with 4,293 usable cases (Montgomery and Powell, 2003). The gender wage gap was found to be lower among those who had an MBA, suggesting that higher educational attainment for individuals helps to decrease the gender wage gap (Montgomery and Powell, 2003).

In the education literature, there is past research that also supports the affect of individual level factors on income. Monks and Robinson (2000) used data from the 1993 National Survey of Postsecondary Faculty (NSOPF) to examine income differences across both racial and gender groups. Findings showed that the majority of the income gap between both gender and racial groups was due to these factors (in order of largest effect): rank and tenure status, experience and seniority, and highest degree earned (Monks and Robinson, 2000).

Gilbert, King, and Cregan (2002) looked at the gender pay gap between primary school teachers in New Zealand. The sample consisted of 125 New Zealand primary school teachers, of whom 28 were male (Gilbert, King, and Cregan, 2002). Gender differences in qualification levels (which in their study referred to a combination of educational attainment and professional or in-service training), teaching experience, and how often the individual had changed schools accounted for 61.4 percent of the income differential between males and females (Gilbert, King, and Cregan, 2002).

Summarily, several factors that can be classified under human capital have an effect on an individual's income. Higher levels of educational attainment appear to lead towards a higher income, regardless of sex. Also, experience seems to have a positive affect on income. In addition, work function and hours worked also have an affect on one's income.

Human capital is an area where women's progress is in line with the shrinking pay gap. In 1969, when the pay gap was 58.6 percent, only 8.1 percent of women had finished four or more years of college compared to 13.6 percent of men (U.S. Census Bureau, 2009). In 2008, 28.8 percent of women had completed four or more years of college, compared to 30.1 percent of men (U.S. Census Bureau, 2009). If the differences between men and women with these human capital factors of income have lessened, but remains significant, then we must look for more

reasons to explain the current pay gap. If individual factors, such as human capital, have been affected by sex, then perhaps the structural elements of the workplace have also been affected by sex.

Sex – Structure – Income

The structure of the job market, in general, has certain jobs that are much more rewarding than others with regard to income. There is also a structural organization to each workplace or company that is used to represent a pay hierarchy. Of the many factors that can affect the makeup of the structure of the job market, sex has to be considered as one of the most significant.

The glass ceiling and the glass escalator are two theoretical ideas to consider when looking at sex and structure in the workplace. Hultin (2003), in her research, referred to the glass ceiling as a ceiling for women in the workplace with regard to level of career advancement. By this she meant there is only a certain level to which a woman's career can advance. The glass escalator, meanwhile, referred to men being on an upwardly mobile career path in predominantly female occupations (Hultin, 2003). Hultin (2003) used a large Swedish longitudinal data set for her research and found evidence of a glass escalator in Sweden, but not a glass ceiling.

Research in the engineering field also produced results that are contrary to the glass ceiling effect in the pay gap. Morgan (1998) used two different data sets, the Survey of Natural and Social Scientists and Engineers (SSE) and a survey of men and women engineers, to look for a glass ceiling effect as well as a cohort effect. The 17,012 respondents in the study were separated into cohorts based on their year of college graduation (Morgan, 1998). The results found that there was more of a cohort effect than a glass ceiling effect (Morgan, 1998). The

earnings penalties for younger cohorts of women were found to be essentially zero (Morgan, 1998).

Alessio and Andrzejewski (2000) responded to Morgan's findings. They claimed that Morgan (2000) had flaws in her data due to bias, and that the data presented traces of a glass ceiling (Alessio and Andrzejewski, 2000). The glass ceiling was said to consist of both a gender survival gap as well as a gender wage gap (Alessio and Andrzejewski, 2000). The gender survival gap claims that due to discrimination, women have a harder time surviving in a career (Alessio and Andrzejewski, 2000). Referencing the data set used by Morgan (1998), Alessio and Andrzejewski (2000) looked at the percentage of men and women that responded when resurveyed at the two, four, and seven-year marks. At the seven-year mark, 55 percent of the males responded, while 42 percent of the females responded (Alessio and Andrzejewski, 2000). Alessio and Andrzejewski (2000) stated that one could consider this 13 percent difference to be the better survival rate for men.

Maume (1999), however, found different results. Maume's (1999) research used data from the Panel Study of Income Dynamics (PSID) between the years 1981 and 1987. The total sample size in the pooled data set was 16,312 (8,534 men and 7,778 women) (Maume, 1999). The results of the study showed that men were more likely to receive management and supervisory positions than women (Maume, 1999). Also, women had to put in more time with the company than men in order to receive promotions (Maume, 1999). Men were placed on a much quicker path to management (Maume, 1999). Blau and Devaro (2007) also found that men are more likely to receive a promotion than women.

Cotter et al (2001) also looked at the glass ceiling effect in regards to both race and sex. Cotter et al (2001) used the 1976-1993 waves of the Panel Study for Income Dynamics (PSID).

A total of 39,051 cases from 4,278 persons were selected based on age (25-29) and the amount of hours worked during the year (at least 250). Their research showed that, for sex, there was evidence of a glass ceiling for women (Cotter et al, 2001).

When women do move into management positions, they are put in lower and middle-management positions. Cohen and Huffman (2007) found in their research that even when women do receive positions in management, they tend not to make it all the way to higher-level management positions. When women were found in higher-level management positions, there was a trickle down affect for other women working for the company, as the pay gap between men and women narrowed in these situations (Cohen and Huffman, 2007). However, women were many times trapped in middle and lower-management, where decisions on salary were not theirs to make (Cohen and Huffman, 2007).

When women are able to move past lower and middle management positions, Goman and Kmee (2009) found it was better to switch companies as opposed to being promoted within when looking for upper management positions. Gorman and Kmee (2009) looked at corporate law firms to examine women's upward mobility within the firms. Their research found that there was a female mobility disadvantage at higher organizational levels as far as internal promotions (Gorman and Kmee, 2009). However, this was not the case for external hires (Gorman and Kmee, 2009).

Social closure can also be a factor within the workplace structure. Roscigno, Garcia, and Bobbitt-Zeher (2007) looked at social closure with respect to both race and sex. Social closure, according to Roscigno et al (2007), implied discrimination as white males preferred to surround themselves with white males, thus closing off others for positions in both informal and institutional arrangements. This presents problems within institutional and organizational

structures when people in higher positions only want to hire people like themselves. Elliott and Smith (2004) found similar results. In addition, Elliott and Smith (2004) also found that there was another factor, effective network assistance, involved. Network assistance refers to people getting a job through a friend or family member (Elliott and Smith, 2004). White males, since already in power, were found to benefit most from receiving network assistance from their white male connections (Elliot and Smith, 2004).

In the education literature, the type of institution and occupational positions in which women work, as opposed to men, can also have an impact on the pay gap. Monks and McGoldrick (2004) looked at the gender pay gap among the top five salaried individuals at private, higher education institutions. Men had a 13 percent pay advantage when compared to women (Monks and McGoldrick, 2004). Most of this, 10.4 percent, was attributed to differences in the types of institutions and occupations of women as opposed to men (Monks and McGoldrick, 2004). Women administrators were found to have fewer jobs at larger, research-oriented universities and were found to have lower-paying positions at smaller institutions (Monks and McGoldrick, 2004). Also, women were less likely to have jobs as deans of business and law schools (Monks and McGoldrick, 2004).

Summarily, although there is research that shows little or no glass ceiling effect, there is research that supports its existence. Women appear to have a more difficult time climbing the career ladder. Also, research suggests that men are riding the glass escalator to higher ranking positions in female-dominated occupations.

Sex – Income

So far, the review of literature has covered individual and structural level variables that have an effect on one's income. When discussing the structure of the job market and workplace, sex was considered to have an affect on both. Sex by itself, however, should also be considered when discussing the pay gap.

Using data from the 2000 Census, Miller (2008) looked for differences in the pay gap by sector of employment and, according to, the earnings distribution. Evidence of a glass ceiling was investigated, as well as the sticky floor effect (Miller, 2008). The sticky floor effect suggests that women are stuck at the bottom of the career ladder (Miller, 2008). Miller (2008) examined the salaries of workers aged 25-64 in both the private and government sector. The private sector did not display the glass ceiling or sticky floor effect; however, the government sector displayed a sticky floor effect to account for part of the wage differences (Miller, 2008). In the government sector, in the lowest decile, the pay gap between men and women was 26 percent (Miller, 2008). In the highest decile, the pay gap was only 13 percent (Miller, 2008). The results of the study showed that men made more than women, regardless of employment sector (Miller, 2008). Also, the pay gap was larger in the private sector than among government employees or the public sector (Miller, 2008).

Solberg (2005) tested the crowding hypothesis as a possible explanation for the gender pay gap. The crowding hypothesis states that the gender pay gap comes from females being crowded into low-paying jobs (Solberg, 2005). Solberg (2005) used the 1996 wave of the National Longitudinal Survey of Youth (NLSY) in his study. Although some of the pay gap could be attributed to female crowding in low-paying jobs, the results showed that other factors also play a part (Solberg, 2005). Solberg (2005) had possible explanations, such as the glass

ceiling or some other form of gender discrimination, but did not test for them in his research. Sorensen (1989) also found results that hinted at the crowding hypothesis. Using the 1984 Panel Study of Income Dynamics, Sorenson (1989) found that women in female-dominated jobs were found to earn 6-15 percent less than women with the same characteristics in other jobs. A female-dominated job was one that had at least 60 percent female representation according to the 1980 Census (Sorensen, 1989).

Dinovitzer, Reichman, and Sterling (2009) examined the pay gap between male and female lawyers who had recently entered the profession. They found, across the sample, that women earned 5.2 percent less than men, net of credentials, work profiles, opportunity paths and structures, and legal markets (Dinovitzer et al, 2009). While 5.2 percent may not sound like a drastic difference, over a lifetime of earnings, it is a dramatic difference in dollars.

In the education field, even accounting for other factors, a sex pay gap can be found. Travis, Gross, and Johnson (2009) examined faculty salaries at one university. The results showed that sex, even after controlling for rank, academic field, and years of service, was a cause for part (men made $2,986 more when the mentioned conditions are identical) of the pay gap (Travis et al, 2009). The findings were true in the science fields where women typically have lower representation, as well as the fields viewed as traditionally female (Travis et al, 2009).

Solberg and Laughlin (1995) looked at seven occupational categories to see if there was a gender pay gap. When they excluded fringe benefits from the compensation measure, six of the seven occupational categories saw men receiving more compensation than women: craft, operatives, sales, managers, service, and professional and technical (Solberg and Laughlin, 1995). The only category that did not report this was the most female-dominated category, which was clerical (Solberg and Laughlin, 1995).
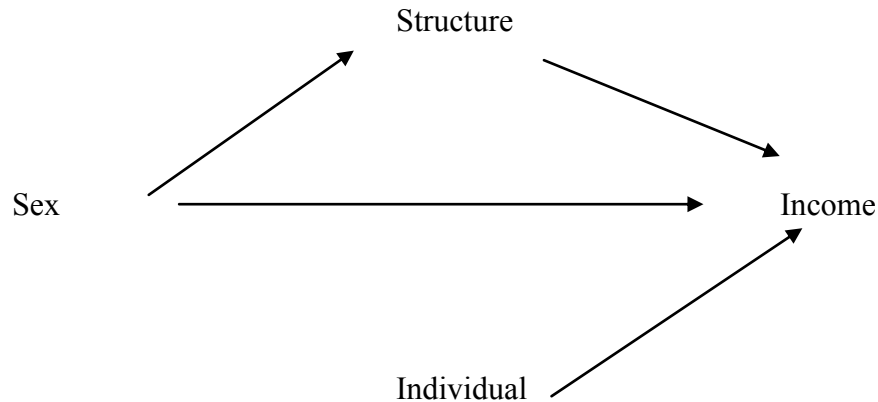
Maume (2004) looked to see if the pay gap continued throughout the career path. Women were found to actually be closer in pay to men in younger cohorts than older cohorts (Maume, 2004). Also, the results of the analysis showed that the majority of the gap was attributable to unexplained factors, such as discrimination (Maume, 2004). Morgan (2008) found something similar when examining college majors. At the bachelor's level, among all of the majors that were considered, except for professionals (business, law, and medicine), a pay gap was found between men and women (Morgan, 2008).

Prokos and Padavic's (2005) research was looking for the glass ceiling affect on the pay gap, but found another variable to account for the main difference in pay. The research looked at possible explanations for the pay gap in the engineering field (Prokos and Padavic, 2005). Using an integrated data set called SESAT, a sample set of 74,462 workers employed in science and engineering occupations were examined (Prokos and Padavic, 2005). Although there was a pay gap (82 percent from their 1993 survey, and 78 percent from their 1999 survey), they concluded that the glass ceiling was not the reason (Prokos and Padavic, 2005). Discrimination, in forms they were unable to measure, was the explanation given by the researchers (Prokos and Padavic, 2005).

In many of the studies looking at educators, there were pay gaps that could not be accounted for. Monks and Robinson (2000) found that income differentials were in large part due to individual factors. However, within each racial group, men made more than women net of other factors (Monks and Robinson, 2000). Gilbert et al (2002) found that 61.4 percent of the pay gap in their data set was due to human capital factors, which left 38.6 percent of the gap due to discrimination factors that could not be measured.

Even if sex is not the primary factor in the pay gap, it does appear to play a part, as women earn less than men even when holding constant all factors.

Figure 1: Model Segment

Structure

Sex → Income

Individual

Hypotheses

      Given the preceding review of literature, the following set of hypotheses will be tested in this study among those employed in educational occupations:

1. Individuals with higher levels of educational attainment will have higher incomes.

2. Individuals with more experience will have higher incomes.

3. Men will be more likely to be employed in administrative positions than women.

4. Men will be more likely to be teachers at the university level than women.

5. Women will be more likely to be teachers at the elementary and middle school level than men.

6. Net of other factors, men will have higher incomes than women.

CHAPTER 3

METHODS

Data

The data for this study was drawn from the 2007-2009 Current Population Survey (CPS). The CPS is used by the government primarily to obtain official statistics on employment and unemployment. The CPS, however, also provides the government with information on race, age, sex, marital status, and many other variables in order to describe the demographic status of the U.S. population. The information is gathered via interviews conducted with approximately 57,000 households each month. The 2007-2009 CPS data contained information from 468,546 respondents.

For this study, data was restricted to those respondents aged 18 to 65 who identified themselves as falling into one of the following occupations: educational administrator, postsecondary teacher, secondary teacher, or elementary and middle school teacher. Only respondents with valid weights from the CPS were selected. The resulting sample included 11,828 respondents. Once the sample was created, relative weights to the sample were created.

Dependent Variable

The income measure for this study is defined as the total wage and salary earnings for the year. It was measured at the ratio-level. With respect to this variable, it must be noted that salaries for teachers increase from one educational level to the next. This means that, in general, university professors make more money than high school teachers who make more money than elementary or middle school teachers.

Independent Variables

     1. Sex. The respondents in the survey were asked to indicate their biological sex, with response options being "male' and "female." Sex is a nominal-level variable.

     2. Age. The age variable asked the respondent to indicate their age at the time the data was being collected. The data was collected one year later than the year about which they were being asked. Therefore, in order to obtain the age for the time period the CPS focused on, a new age variable was created that subtracted one year from each respondent's age given in the study. This revised ratio-level variable was used in the analysis.

     Surprisingly, given its purpose, the CPS does not include a variable that measures years of experience. For analytical purposes, the age variable will be used as an indicator of experience. Although not an ideal measure of experience, it is a justifiable substitution considering that older workers are likely to have more experience.

     3. Race. Respondents were asked to identify their race when taking the survey. There were 21 possible response categories from which to select. An initial review of the frequency distribution found that the vast majority of respondents classified themselves as "White, non-Hispanic." Given the dispersion of the remaining respondents over the remaining 20 possible response categories, the decision was made to recode the variable of race. Therefore, for analytical purposes, race was divided into two groups: white non-Hispanic and minority, resulting in a nominal-level variable.

     4. Educational attainment. Respondents were asked to indicate their current level of educational attainment, an ordinal-level variable. Given the chosen occupational area under investigation in this study, respondents in the sample reported the following levels of educational attainment: some college including associate degree, bachelor's degree, and advanced degree. It

must be noted that advanced degree did not distinguish between having a doctorate or a master's degree.

  5. Occupation. Respondents were asked for the primary occupation they fulfilled for the year in question. Respondents with the following occupations were selected: elementary and middle school teachers, secondary teachers, postsecondary teachers, and educational administrators. This is a nominal level variable.

CHAPTER 4

FINDINGS

Demographic Profile of Respondents

As shown in Table 1, 68 percent of the sample was female and 80.2 percent self-identified as being white, non Hispanics. The average age in the sample was 41.4 with a standard deviation of 12.08. Surprisingly, 52.4 percent of the respondents had an advanced degree, while another 40.9 percent had a bachelor's degree. Only 6.7 percent of the respondents had some college including an associate's degree. The respondents are well educated. Slightly less than 50 percent of the respondents (49.8 percent) were elementary and middle school teachers, with 20.9 percent of the respondents secondary school teachers, 18.5 percent postsecondary teachers, and 10.8 percent educational administrators. With respect to the dependent variable, the mean income for the entire sample was $43,012, with a standard deviation of $22,466.

In reviewing the demographic profile of the full sample, with the exception of the variable age, all the individual independent variables had skewed distributions which could influence subsequent analysis. To better understand the selected respondents for this analysis, the demographic information was subdivided by sex. There are three variables where the male and female respondents noticeably differ. First, with respect to educational attainment, 10.3 percent more men have an advanced degree when compared to the female respondents (59.4 percent versus 49.1 percent). Second, when examining the distributions for occupation, the female respondents are clearly concentrated in the elementary and middle school teachers category (59.3 percent) while for male respondents there is a more even distribution across response categories. Approximately 30 percent of male respondents are found in each of the

teacher categories while the remainder (12.3 percent) identified themselves as administrators. Third, male respondents, on average, made $8,528 more than females across the entire sample.

Hypothesis Testing

Hypothesis 1 predicts a positive association between level of educational attainment and income. As shown in Table 2a, individuals with an advanced degree had a mean income of $51,418, with a standard deviation of $22,513. Individuals with a bachelor's degree had a mean income of $35,408, with a standard deviation of $17,896. Individuals with some college including an associate's degree had a mean income of $23,565, with a standard deviation of $18,248. The ANOVA results (F=1212.117, df=2, p<.001) indicate a strong relationship between educational attainment and income. Therefore, individuals with higher levels of educational attainment were more likely to have higher incomes. Hypothesis 1 was supported.

Hypothesis 2 predicts a positive association between level of experience and income. As shown in Table 2b, the Pearson's r value of .319 (p<.001) indicates a positive, moderate association between the 2 variables. Therefore, the more experienced (i.e.: older) a person is, the more income they earn. Hypothesis 2 was supported.

Table 2c shows the results of the Chi-square tests performed to test Hypotheses 3, 4, and 5, all of which were related to an individual's biological sex and his or her occupational category. Hypothesis 3 predicted that within education, men would be more likely to be found in administrative positions than women. As shown in the top section of Table 2c, for the total sample, 10.8 percent of the respondents had administrator positions, 12.4 percent of the male respondents and 10.0 percent of the female respondents. The Chi-square value (14.07, df=1, p<.001) indicates an association between biological sex and being an administrator. Therefore,

the results indicate that within education, men are more likely to be found in administrative positions than women. Hypothesis 3 was supported.

Hypothesis 4 predicted that men would be more likely to be teachers at the university level than women. As shown in the middle section of Table 2c, for the total sample, 18.5 percent of the respondents were postsecondary teachers, 29.6 percent of the male respondents and 13.3 percent of the female respondents. The Chi-square value (451.991, df=1, p<.001) indicates a strong association between biological sex and being a postsecondary teacher. Therefore, the results indicate that men are more likely to be postsecondary teachers than women. Hypothesis 4 was supported

Hypothesis 5 predicted that women would be more likely to be teachers at the elementary and middle school level than men. As shown in the bottom section of Table 2c, for the total sample, 49.8 percent of the respondents were elementary/middle school teachers, 29.7 percent of the male respondents and 59.3 percent of the female respondents. The Chi-square value (903.320, df=1, p<.001) indicates a strong association between biological sex and being elementary/middle school teachers. Therefore, the results indicate that women are more likely to be elementary/middle school teachers than men. Hypothesis 5 was supported.

To test Hypothesis 6, OLS regression was run. The independent variables regressed on income were sex, age, race, educational attainment, and occupation. Dummy variables were created for sex, race, educational attainment, and occupation. The mode for each of these variables was used as the reference category: female, white non-Hispanic, advanced degree, and elementary/middle school teacher. In addition, a standardized age variable (ie: recentered and squared) was created to account for the possible negative effect of older ages on income. As

shown in Table 3a, net of the other factors, being male instead of female was found to increase an individual's income $7,296. Hypothesis 6 was supported.

Among the other variables introduced in the regression equation, each one-year increase in age, an individual was found to make an additional $456. The standardized age variable, however, showed the pay penalty for older age to be -$2,912. Individuals from minority race/ethnic groups made -$401 less than white non-Hispanics. Individuals with some college including an associate's degree saw a pay penalty of -$25,583 compared to those with an advanced degree. Having a bachelor's degree saw a pay penalty of -$12,298 compared to those with an advanced degree. Secondary teachers were found to make $1,612 more than elementary/middle school teachers. Postsecondary teachers, surprisingly, were found to make $3,535 less than elementary/middle school teachers. Administrators were found to make $13,034 more than elementary/middle school teachers. The adjusted R-square for the regression equaled .305, indicating that slightly more than 30 percent of the variation among incomes was accounted for by the independent variables of sex, age, experience, race, occupation, and educational attainment.

To further understand the difference in income, OLS regression was undertaken again but separately for men and women. The remaining independent variables of age, experience, race, occupation and educational attainment were regressed on income. As shown in Table 3b, for men, a 1-year increase in age saw an increase of $667, while the standardized age variable showed a pay penalty of -$4,907 for older ages. Among males, being a minority had a pay penalty of -$3,066 for males. For educational attainment, men with some college including an associate's degree saw a pay penalty of -$17,906 compared to an advanced degree. Men with bachelor's degrees saw a pay penalty of -$11,490 compared to those with an advanced degree.

Being a secondary teacher instead of an elementary/middle school teacher saw a man make $2,907 more. Being a postsecondary teacher instead of an elementary/middle school teacher saw a man make $262 less. Being an administrator instead of an elementary/middle school teacher saw a man make $14,765 more. The adjusted R-square for this equation was .336, representing a slight increase in variation explained when compared to the R-square for the total sample.

For women, a 1-year increase in age saw a woman make $356 more, with the standardized age variable showing a -$2,205 pay penalty for older ages. Among women, being a racial minority saw an increase of $1,017. Having some college including an associate's degree saw a woman make $28,006 less than a woman with an advanced degree. Having a bachelor's degree saw a woman make $12,406 less than a woman with an advanced degree. Being a secondary teacher instead of an elementary/middle school teacher saw a woman make $1,255 more. Being a postsecondary teacher instead of an elementary/middle school teacher saw a woman make $5,397 less. Being an administrator instead of an elementary/middle school teacher saw a woman make $12,745 more. The adjusted R-square for this equation equaled 0.269. Therefore, less of the variation in female education incomes was explained when compared to males.

Table 3c shows the partitioning of variance for the individual, structural, and sex segments of the theoretical model. As noted before, dummy variables were created for sex, race, educational attainment, and occupation. The mode for each of these variables was used for the reference category: female, white non-Hispanic, advanced degree, and elementary/middle school teacher. Also, as noted before, a standardized age variable was included. The individual segment of the income model included the age, race, and educational attainment variables. The individual segment of the model was found to account for 79.4 percent of the variation in

income. The structural segment of the model was made up of the occupational variable. This

segment accounted for 12.4 percent of the variation in income. The third segment was the

biological sex segment. This segment accounted for 8.2 percent of the variance in the model.

CHAPTER 5

DISCUSSION

There were some expected and some unexpected findings in this study. Among the expected findings were that men earn higher levels of income than women in educational positions. This corresponds with the pay gap found in broader society. In addition, as expected, men were more likely to be educational administrators than women. This corresponds with the glass escalator theory.

What was unexpected were the effects of level of educational attainment and occupation on income and these effects being larger among women than men. As an example, why would being a postsecondary teacher result in a decrease in income when compared to elementary and middle school teachers, and why would the decrease be noticeably larger among women? Perhaps a difference in the requirements or structure of a unified school district versus a state university or private college would account for this finding. In many areas of the United States, teachers in unified school districts are unionized. Because of this, school districts and/or states may be required to provide cost of living adjustments and years in service increases when actual "pay" raises are not given. These practices would increase income for elementary, middle, and secondary teachers. However, these annual adjustments are not required at the post-secondary level. Additionally, when examining post-secondary teachers, no variables were available to differentiate full-time versus part-time teachers, nor to differentiate adjunct versus tenured or tenure-track faculty.

There are other variables that the CPS does not include that perhaps could have explained more of the variation in income. As an example, this data set did not break down each teacher position by area of specialization. Having the subject taught along with the level would have

provided even more insight into which teachers receive higher incomes. Knowing whether a teacher was employed at a public, private or religiously affiliated school also would have been advantageous. Additionally, there was no indication on whether a teacher had additional duties to perform with his or her job, such as coaching. There was also no measure for experience, either with the current job or with teaching in general. Finally, it is possible some states or regions of the country have base salaries for each level of teaching that differ noticeably given cost of living differentials across the U.S. Additionally, there was no indication on whether a teacher had additional duties to perform with his or her job, such as coaching. There was also no measure for experience, either with the current job or with teaching in general. Finally, it is possible some states or regions of the country have base salaries for each level of teaching that differ.

Another interesting piece of information was the high number of advanced degrees found among the sample. The majority of the teachers taught at the elementary and middle school level, which does not necessarily require an advanced degree. This was more evident for female respondents, as 49.1 percent of the respondents had an advanced degree, and 59.3 percent of the respondents were elementary or middle school teachers. The high percentage of advanced degrees could be associated with required continuing education requirements among teachers at the primary and secondary levels, or could be reflective of these teachers seeking formal means to increase their personal salaries.

As for the hypotheses tested, all were supported. The relationship between sex and income was a weak to moderate relationship. Men still earned an average of over $8,000 a year more than women in income. The other variables tested played a role in explaining this income discrepancy. Besides those mentioned earlier, the variables that cannot be measured here, such

as discrimination, go beyond just how much an employer pays his or her employees. It also goes into the factors at the structural and individual level. The sex gap has closed in some areas, such as educational attainment, which in turn is helping the pay gap close. Some factors, such as job choice, have seen a shift yet still seem to hold close to the gender roles and stereotypes that have been in the U.S. for generations. As much progress that has been made in all these areas in terms of striving for equality, it appears that more can still be made.

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APPENDIX

Table 1: Demographic Profile of Full Sample

	Total Sample		Men		Women	
	f	percent	f	percent	f	percent
Sex (n=11,828)						
Male	3789	32.0	-	-	-	-
Female	8039	68.0	-	-	-	-
Race (n=11,828)						
White, non-Hispanic	9484	80.2	3000	79.2	6485	80.7
Minority	2344	19.8	789	20.8	1555	19.3
Occupation (n=11,828)						
Elementary/Middle school teacher	5893	49.8	1125	29.7	4768	59.3
Secondary school teacher	2473	20.9	1076	28.4	1397	17.4
Postsecondary school teacher	2189	18.5	1120	29.6	1069	13.3
Educational administrator	1274	10.8	468	12.3	806	10.0
Educational Attainment (n=11,828)						
Some college including associate's	787	6.7	202	5.3	585	7.3
BA/BS	4841	40.9	1337	35.3	3504	43.6
Advanced Degree	6200	52.4	2249	59.4	3951	49.1
	mean	SD	mean	SD	mean	SD
Age (n=11,828)	41.42	12.08	41.63	12.47	41.32	11.81
Income (n=11,828)	$43,012	22,466	$48,809	23,994	$40,281	21,167

Table 2a, One-Way ANOVA Test

Educational Attainment	N	Mean Income	S.D.
some college including associate	787	$23,565	$18,248
BA/BS	4841	$35,408	$17,896
Advanced degree	6200	$51,418	$22,513
Total	11828	$43,012	$22,466

F=1212.117***, df=2

*p<.05, **p<.01, ***p<.001

Table 2b: Pearson's r Correlation

	Income
Age	0.319***

*p<.05, **p<.01, ***p<.001

Table 2c, Chi-square tests

	Men	Women	Total
Non-administrators	3321	7234	10555
Percentage	87.6%	90.0%	89.2%
Administrators	468	806	1274
Percentage	12.4%	10.0%	10.8%
Total	3789	8040	11829
Percentage	100.0%	100.0%	100.0%
Chi-square=14.07***, df=1			
Non-postsecondary Teachers	2668	6971	9639
Percentage	70.4%	86.7%	81.5%
Postsecondary Teachers	1120	1069	2189
Percentage	29.6%	13.3%	18.5%
Total	3788	8040	11828
Percentage	100.0%	100.0%	100.0%
Chi-square=451.991***, df=1			
Non-Elementary/Middle School Teachers	2664	3272	5936
Percentage	70.3%	40.7%	50.2%
Elementary/Middle School Teachers	1125	4768	5893
Percentage	29.7%	59.3%	49.8%
Total	3789	8040	11829
Percentage	100.0%	100.0%	100.0%
Chi-square=903.320***, df=1			

*p<.05, **p<.01, ***p<.001

Table 3a

	Total Sample		
	B	SE	Beta
(constant)	$30,439	$738	
age	$456	$15	0.244***
standardized age	-$2,912	$194	-0.117***
male	$7,296	$387	0.152***
minority	-$401	$436	-0.007
some college including associate	-$25,583	$720	-0.284***
BA BS deg	-$12,298	$382	-0.269***
secondary teachers	$1,612	$459	0.029***
postsecondary teachers	-$3,535	$499	-0.061***
administrators	$13,034	$594	0.180***
N	11,828		
F	577.152	***	
Adjusted R-square	0.305		

*p<.05, **p<.01, ***p<.001

Table 3b	Men			Women		
	B	SE	Beta	B	SE	Beta
(constant)	$29,416	$1,397		$34,180	$860	
age	$667	$27	0.346***	$356	$17	0.198***
standardized age	-$4,907	$353	-0.192***	-$2,205	$231	-0.092***
male	-	-	-	-	-	-
minority	-$3,066	$794	-0.052***	$1,017	$514	0.019*
some college including associate	-$17,906	$1,465	-0.168***	-$28,006	$815	-0.344***
BA BS deg	-$11,490	$737	-0.229***	-$12,406	$440	-0.291***
secondary teachers	$2,907	$835	0.055***	$1,255	$551	0.022*
postsecondary teachers	-$262	$858	-0.005	-$5,397	$628	-0.087***
administrators	$14,765	$1,098	0.202***	$12,745	$704	0.181***
N	3,789			8,039		
F	239.546	***		369.67	***	
Adjusted R-square	0.336			0.269		

*p<.05, **p<.01, ***p<.001

Table 3c

Variable	b	Beta	sig.	part	sq. part	per model segment	pct of total
age	455.752	0.244	0.000	0.236	0.056	0.204	79.4%
standardized age	-2912.369	-0.117	0.000	-0.115	0.013		
some college including associate	-25583.237	-0.284	0.000	-0.272	0.074		
BA BS deg	-12297.863	-0.269	0.000	-0.247	0.061		
minority	-401.029	-0.007	0.358	-0.007	0.000		
secondary teacher	1611.785	0.029	0.000	0.027	0.001	0.032	12.4%
postsecondary teacher	-3534.559	-0.061	0.000	-0.054	0.003		
administrator	13033.697	0.180	0.000	0.168	0.028		
male	7295.559	0.152	0.000	0.145	0.021	0.021	8.2%

Total Unique Variance	0.257
Total Shared Variance	0.048
Total Variance (R^2)	0.305