

Women in Higher Education and the Gender Wage Gap

By  
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## *Executive Summary*

The gender wage gap has managed to maintain a significant and persistent presence throughout history. When considering the significant strides women have made in terms of social and economic status, and the importance of gender equality, there has been reasonable interest in researching and addressing this issue for both researchers and policymakers, respectively.

Women have been increasingly participating in the higher education sector, exceeding men in areas including degree attainment. Despite this phenomenon, a gender inequality in pay continues to exist. The gender wage gap has hovered in the seventy percentage range for the past ten years, and has yet to break the eighty percentage mark (United States Census Bureau, 2015).

Utilizing a trend, comparison analysis of existing data on male-female education attainment, this study attempted to answer the following research question:

- Does female higher education attainment significantly contribute to decreasing the gender wage gap?

The results indicated that female higher education attainment does not significantly contribute to decreasing the gender wage gap. The results also indicated that higher education is beneficial for women in terms of earning higher incomes.

This study was of significance because pay inequalities have the potential to threaten women and their livelihood, especially considering women having been a historically marginalized group in society. It is also important to determine the outcomes of the investment time and money women make when attaining a higher education. This study contributes to the

understanding of the gender wage gap; and it also contributes to the understanding of how female higher education attainment relates to the gender wage gap and what impact it may potentially have for women.

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## *Chapter 1: Introduction*

### *Background of the Problem*

The gender wage gap in the United States has had a significant, as well as persistent, presence throughout history; and the gap has been a primary indicator of gender inequality in pay. As such, both policy makers and researchers have reasonable interest in the addressing and the understanding of this issue of inequality. In 2014, the gender wage gap was at 78%, in which women earned 78% of what men earned. Looking at the gender wage gap over an extended period of time, in 1960, the gender wage gap was 61%; in 1970, the gender wage gap was 59%; in 1980, it was 60%, in 1990, it was 72%; and in 2000, it was 74%. Additionally, over the past ten years, the gender wage gap has hovered in the high seventy percentage range, and has yet to break into the eighty percentage range (United States Census Bureau, 2014). Based on these percentages, it can be inferred that the gender wage gap has not *significantly* decreased throughout history, especially considering the significant strides women have made in terms of social and economic status. Although women have been a notably marginalized group in history, they have achieved significant successes, with the help of critical legislation, towards reaching equal social and economic platforms to those of men. In earlier times, women's role was perceived as homemakers, and women generally made small contributions of earnings to family income. In current times, women have dramatically increased their participation in the labor force and the contribution of wives' earnings to their family income has steadily increased (United States Bureau of Labor Statistics, 2014). Women are also increasingly finding themselves in higher paying, professional positions. In spite of this, women have yet to reach an equal platform to men in terms of pay.

In analyzing the gender gap, researchers look at the gender wage gap from different perspectives and reach various conclusions that have enhanced the understanding of the gender wage gap. What can be ultimately concluded from these previous studies is that there is not any one conclusion to the issue. There are many variables which have been found to play a pertinent role in the gap, and higher education attainment can be considered one of these variables.

### *Statement of the Problem and Research Question*

Women are increasingly making a presence in the higher education sector; and this has been so much that in many ways, women have become the majority in the higher education sector. In fact, women are, in current times, notably exceeding men in higher education degree attainment (National Center for Education Statistics, 2010). With knowledge of this phenomenon, it is of importance to note the gender wage gap has significantly persisted despite women increasingly entering the higher education sector and increasingly attaining higher education degrees. In many ways, it is a harsh reality of pay inequality for women and society alike; especially for those who have invested their time and money into attaining a higher education. As a result, this can potentially undermine women's views of the quality and returns of a higher education. As such, the research question this study attempts to address is:

- Does female higher education attainment *significantly* contribute to decreasing the gender wage gap?

### *Methods and Procedures of the Study*

This is an applied research study that will attempt to answer the above noted research question, therefore attempting to determine the significance of the contribution of female higher

education attainment on decreasing the gender wage gap. This study will utilize a time series analysis approach in an attempt to identify potential growth, trends, etc. This study will begin with a literature review on historical and theoretical perspectives, and will then conduct a comparison analysis of existing, quantitative data on male-female level of education and income to potentially provide an assessment of the significance of female higher education attainment in relation to the gender wage gap.

### *Significance of the Study*

The inequality of the gender wage gap is an important issue in today's society, being that today's society increasingly promotes equality on a multitude of levels, whether it is gender, race, age, etc. This inequality poses serious issues for women and their livelihood. As women were a historically marginalized group in society in terms of social and economic status, it is important to address this inequality that has been a continual phenomenon throughout history. Increasing the understanding of this issue is one of the first steps towards being able to meaningfully address the issue.

Equally as important is determining the significance of female higher education attainment; which is an aspect of relation to the inequality of the gender wage gap. A higher education does not come easy these days; it is an investment of time and money for students. In general, students seek a higher education for increased opportunities in terms of employment and earnings. As such, with an ongoing gender wage gap, it is important to assess how higher education attainment potentially impacts women's earnings in terms of the role it plays in relation to the gender wage gap. In turn, the study is of importance as it may contribute to the understanding of the gender wage gap; it may also contribute to understanding how female

higher education attainment relates to the gender wage gap and what impact it may potentially have for women.

In the literature review, the gender wage gap will be further introduced through historical and theoretical perspectives, and women in higher education will also be introduced in relation to the gender wage gap.

## *Chapter 2: Literature Review*

### *The Gender Wage Gap*

The gender wage gap has continually been an area of interest and perplex for researchers and policy makers alike. Although there has been a continued stride for women's progression and gender equality in the United States, women notably fall short of men in terms of income. In current times, more and more women are pursuing a higher education, earning degrees, and entering the professional workforce; and this is to the extent that in many cases, they are outnumbering men. In spite of such progresses, the gender wage gap continues to exist. As recent as 2013, the median income for men working full time and year round was \$50,852; and the median income for women working full time and year round was \$39,798. Therefore, there was a pay gap of approximately 22%, with women being paid approximately 78% of what men were being paid (Unites States Census Bureau, 2015). When considering equality and anti-discrimination of the sexes, the persistence of the gender wage gap raises serious concerns. In light of this phenomenon, researchers continually attempt to explain the gap, while policy makers have the task of attempting to address it. This literature review will examine the historical, legislative, and theoretical aspects of the gender wage gap; and will additionally examine the context of women and higher education.

### *Foundational Legislation*

During the 1960s, the nation's leaders, including President John F. Kennedy, began to realize the role of women in society, and the hardships women faced in terms of social and economic status (National Equal Pay Task Force, 2013).

Two landmark laws established in the U.S. critically affected gender equality: The Equal Pay Act and the Civil Rights Act. The Equal Pay Act of 1963 was established specifically to create gender pay equality. The Equal Pay Act "prohibits sex-based wage discrimination between men and women in the same establishment who perform jobs that require substantially equal skill, effort and responsibility under similar working conditions" (United States Equal Employment Opportunity Commission, 2015). This law was a major success for women, as it was specifically intended to assure that women were being acknowledged as equal to men in terms of labor and wages. The Civil Rights Act of 1964 was established to prohibit discrimination based on "race, color, religion, sex, or national origin"; and in Title VII of the Act, it notably made employment discrimination illegal (Our Documents, 2015). Clearly, this law had the intention to protect various groups of people from discriminatory practices, and this included women. Each of these laws were important to the concept of gender equality, as they provided a legal foundation in the U.S. for women, being historically subordinate to men, to continue to strive for an equal social and economic status to that of men.

Executive Order 11246, enacted in 1965, was another significant law that furthered gender inequality; it prohibited government contractors from employment discrimination and required affirmative action for equal opportunity purposes. Executive Order 11375 amended 11246, by specifically prohibiting discrimination on the basis of sex within the federal government. Title IX of the Education Amendments of 1972 prohibited discrimination on the basis of sex by any education program that receives Federal assistance. The Pregnancy Discrimination Act of 1978 prevented employment discrimination on the basis of a woman's pregnancy or pregnancy related conditions (National Equal Pay Task Force, 2013).

In essence, this historical legislation laid the legal ground work for gender equality, most significantly pay and employment equality. The states' legislation had also begun to follow the federal government's lead. As a result, discriminatory employment practices were largely discouraged and women now had legislative support to establish cases for discriminatory employment practices.

### *Historical Context*

Women have historically been subordinate to men in terms of social and economic status. Correspondingly, their roles in society have historically differed greatly to those of men. Women were responsible for care giving, with the expectation that they take care of their home and their children. Men, in turn, were responsible for working and establishing an income for their household. It was a societal norm of the sexes that is often the case in today's times as well; it's often rare that a woman is the "breadwinner", or main source of income, in a family's household.

As a result, women have essentially been subject to being financially dependent on men due to these traditional roles. This is often a topic of importance for researchers when considering gender inequality. Baxter and Kane find that "women's economic and interpersonal dependence on men can create a practical barrier to gender equality by directly constraining women's opportunities and behavior" (1995, p. 211). In relation, Bedolla discusses the importance of taking into consideration history and structure when researching inequality and marginalization (2007). The historical context of women's social and economic status, as well as their traditional roles, can bear great importance on understanding the continuance of the gender wage gap, as it is likely an origin of the issue. Continued research of this historical context would

benefit in determining to what extent the historical subordination of women has affected their current social and economic status and the persistence of the gender wage gap.

From the 1960s to the 1980s, after significant legislation had historically been put into place, women's social and economic status began to change, as employment and education opportunities for women began to expand. The traditional role of women in society was prominently shifting as more and more women were beginning to enter the workforce and increase their educational attainment. It became a significant time for women's movement into the labor and educational sectors of society (National Equal Pay Task Force, 2013). Smith and Ward noted in their research piece, "The traditional division of labor within the family, with men concentrating on market work and women specializing in productive activities in the household, has been eroding steadily" (1985, p. 560). Women's labor force participation had become a distinctive social change, as the number of women entering and participating in the workforce had begun to grow so extensively. In 1960, the percentage of women in the workforce was 35.5%. In 1970, this percentage had grown to 40.8%; and by 1980, the percentage was 47.7% (United States Bureau of Labor Statistics, 2014). During this time, women were increasingly earning higher education degrees as well. In 1960, the percentage of bachelor's degrees being awarded to women was 35.3%, in 1970 it was 43.1%, and in 1980, it rose to 49%, which was nearly half of the male-female population (Castro and Herman, 1998). In relation to this, O'Neill and Polachek found that between 1976 and 1989, the hourly wage gap between women and men began to decline at approximately 1% per year (1993). This time period was a turning point for women, as the nation's leaders became conscious of the importance of addressing women's discrimination and promoting equality of the sexes; and women were able to capitalize on this movement.

During the time period between the 1980s to the 2000s, the wage gap began to narrow significantly. The wage gap in 1980 was at 60.2 %. In 1970, it narrowed to 71.6%, and in 2000, it narrowed to 73.7 % (United States Census Bureau, 2015). Women had become the majority in higher education degree attainment, and in turn, their wages increased steadily. In 1981, women reached the half point for the population of persons earning bachelors and masters degrees; and throughout this time period, they gradually took the lead (United States Department of Education, 2010). Additionally, the contribution of married women's income to their family income had also begun to increase, rising from 26.7% in 1980 to 33.5% in 2000 (United States Bureau of Labor Statistics, 2014). While the time period between 1960 and 1980 was a significant era of social change, the time period between 1980s to the 2000s was a time period where the outcomes of that social change really became noticeable.

It was during the time period of 2000 through 2010 that progress began to slow down. There was a notable stall of women's labor force participation as well, with very slight increasing and decreasing throughout this time period. In 2000, the percentage of women in the labor force was 57.5%, and by 2010, the percentage of women in the labor force had decreased to 53.6% (United States Bureau of Labor Statistics, 2014). In regards to education, women continued to be the majority in higher education degree attainment, and education attainment continued to be an important factor in women's earnings (National Equal Pay Task Force, 2013). Since 2000, the gender wage gap has hovered in the 70 percentage range. In 2000, the percentage was 73%, and in 2010, it rose to 76%. It has yet to break the 80% mark (United States Census Bureau, 2015).

*Theories*

As previously noted, despite the progress made towards gender equality, including the enactment of equal pay and rights laws and women's changing role in society, a significant gender wage gap continues to exist. Majority of research attempts to identify theories to explain the gender wage gap's persistence.

One widely acknowledged and researched theory is based on gender preference; it is the theory that the difference in preferences and choices that men and women make are primarily contributing to the gender wage gap. Most research has focused on these preferences and choices in terms of college major and occupation. Men tend to gear towards one side of a spectrum, while women tend to gear towards another. Daymont and Andrisani contend that differences between males and females in regard to degree and work preferences accounts for a substantial amount of the gender gap. They noted men were more likely than women to feel that money plays an important factor in their job or career selection; they also noted that upon entering the higher education system, men and women had notable differences in their choice of major. Men were more likely to choose to major in studies such as engineering and business, while women were more likely to choose to major in studies such as humanities, health, and education. Aside from the health related majors, these female-preferred majors tend to yield employment that is not as highly paid as that of the male-preferred majors (Daymont & Andrisani, 1984). Correspondingly, Garcia-Aracil concluded that women tended to be less disadvantaged when they pursued those majors that were characterized as male-preferred (2008). This theory brings to the surface an important aspect of the gender wage gap. It deviates from the commonly referenced discrimination of women, and points out that gender differences in preference should also be a topic of interest when discussing the subject of gender pay differences.

Another theory focuses on child-bearing and its impact on duration of lifetime work for women in comparison to men, and also its impact on women's career choices. Women generally have to take time off from work to have children, whether it be for health and recovery purposes, feeding and childcare purposes, etc. For men having children, taking time off work is usually not as critical. As such, women are known to bear a greater responsibility to their children and/or family. Using data from the National Longitudinal Survey of Youth, Erosa et. al. note that in regards to gender differences in amount of time worked, the percentage for women is less than that of men, and note that for weekly hours worked, women work approximately 40% less hours than do men (2005). Also using various forms of data in their work, Budig and England conclude "We find a wage penalty for motherhood of approximately 7% per child among young American women. Roughly one-third of the penalty is explained by years of past job experience and seniority, including whether past work was part-time. That is, for some women, motherhood leads to employment breaks, part-time employment, and the accumulation of fewer years of experience and seniority, all of which diminish future earnings" (2001, p.219). Data is always beneficial in evaluating trends and the findings in this research are able to distinctly note the correlation between child-bearing and its negative implications in the workplace, which directly correlates to gender wage differences.

A much less popular theory focuses on cognitive reasons for the disparity, emphasizing on how natural characteristics of men and women contribute to a gender gap. It is largely based on the belief that men and women are naturally prone to different thought processes and skills. Whether this is naturalized or socialized is often a debatable subject. In a controversial study, Maccoby and Jacklin argued that men and women had significant differences in cognitive abilities (1974). However, multiple research studies have been conducted to disprove this theory.

Linn and Hyde concluded that gender differences in ability are small, and argue that this theory should be deemphasized. Linn and Hyde's study is beneficial to the understanding of the gender gap as it purposely goes beyond the superficial "men and women think differently" argument. This article examines the difference in gender multi-dimensionally, and in turn, identifies that gender differences are more so based on situation and experience rather than ability; and furthermore, these differences are subject to change with training (1989).

### *Women and Higher Education*

Although it has been indicated in extensive research that women tend to have different preferences in higher education than do men, women are increasingly seeking higher education nonetheless. With regard to the number of women seeking higher education and the persisting gender inequalities in income, there is an ongoing emphasis on the benefits higher education can provide to women in terms of social and economic status, and the degree of its impact on the gender wage gap.

Higher education has been found to be generally beneficial for women. In their evaluation of higher education return trends, Diprete and Buchmann found that higher education provided, for both sexes, a greater probability of marriage, a higher standard of living, and insurance against poverty. They also noted that "the returns to college completion in terms of personal earnings, family standard of living, or the probability of avoiding income deprivation have remained higher for women than for men" (2006, p. 20). Montgomery and Powell compared the gender wage gap for select individuals who attained an advanced degree, and those who only had a college education, and tested whether women who attained a Masters of Business Administration faced less discrimination than women who did not. Their evidence suggested

women with an MBA did face less discrimination than those that did not, as they found a significant wage gap for those who did not complete an MBA, and a smaller, more insignificant gap for those who did (2003). In relation, McCall notes that "the college/non-college wage gap among adults aged 25 to 64 is at least as high among women as among men in both full-time and combined part-time/full-time samples" (2000, p. 251).

However, even with higher education taken into consideration, women still tend to fare less than men in terms of income male-female income ratios. In his study, evaluating college graduates working full time in 1999, Bobbit-Zeher found that women were earning 83% of what men were earning. Similarly to other research, he suggests that college major plays an important role, but he also notes that "While the analysis suggests that segregation of college majors plays an important role in earnings inequality early in young workers' careers, its contribution should not be over stated. In their mid-20s, college-educated women make about \$4,400 less per year than do men even when they have the same level of education, college major, cognitive skills, and selectivity of the college from which they graduated" (2007, p. 15). In 1998, Weinberger did a study on recent college graduates at the time, and found an almost consistent 10-15% gender wage gap (1998). Similarly, found that 15 years after graduating law school, women were earning 60% of that of which their male counterparts were earning; they also found that women were less likely to work in higher paying settings (Wood et. al., 1993).

As a result, relative literature suggests that higher education is beneficial to women in terms of social and economic status, which in turn may impact the gender wage gap; however, an inequality continues to persist when in terms of comparisons to men.

*In Summary...*

Research on the gender wage gap is ongoing; throughout history, women have progressed significantly in terms of legislation, as well as social and economic status; and yet a gender inequality in income continues to exist. Research methods on the gender wage gap have varied from the analysis of statistical data on employment, income, etc., to surveying and tracking progress over extended periods of time. Multiple theories have been consistently identified as explanation of the persisting gap; they generally focus on gender differences in preference, values, thought-processes, and experiences. These theories show that multiple factors can affect the gender wage gap, therefore making it difficult to put one solid conclusion to the problem.

What can be brought to light from this is that education does provide a platform for women to improve their social and economic status, and therefore can play an important role in the context of the gender wage gap. However, in today's times, when women are outnumbering men in attaining higher education degrees yet the gender wage gap continues to exist, it seems that women's educational attainment may not be as important and influential to the wage gap as are the theoretical barriers that were discussed previously in this review.

This study will focus primarily on the research of trends related to male-female higher education attainment and income, in an attempt to identify the significance of its impact, on the gender wage gap.

### *Chapter 3: Methodology*

#### *Purpose of the Study*

As discussed previously, the gender wage gap has been a topic of discussion for both researchers and policy makers, and it is difficult to place one clear conclusion to the issue. There are a multitude of factors that may potentially play a role in the gender wage gap. This particular study is of significance when considering the gender wage gap, as the number of women participating in the higher education sector has been notably increasing; and therefore it is important to gain an understanding on how this phenomenon relates to the gender wage gap. The purpose of this study is to analyze trends related to male-female and female-female education attainment and income, or earnings, to determine the significance of its impact on the gender wage gap. In order to make this assessment, this study will utilize quantitative data. As such, the primary research question that this study will attempt to answer is:

- Does female higher education attainment significantly contribute to decreasing the gender wage gap?

#### *Design*

This study is non-experimental, and as discussed, will utilize quantitative data. A time-series analysis will be the approach utilized to determine the significance of the contribution of female higher education attainment on the gender wage gap by analyzing the trends related to male-female and female-female education attainment and income. A time-series analysis is an appropriate and effective approach for this study as it can be used to analyze and identify trends over a significant period of time in terms of patterns, growth, etc., which, in turn, can allow one to make an assessment of these trends. A weakness of the time-series analysis approach is that

this approach requires generalization of broad data, despite there being various factors known to affect the gender wage gap.

### *Data*

The data sample is based on male-female income by level of education attainment in the United States from the years 1991 through 2009, a 19 year time period. In regards to income, the data sample will consist of median earnings of male-female full time, year-round workers age 25 years and older by highest level of education attainment. In regards to education attainment, the data sample will consist of male-female highest level of education attained in the United States, in terms of a high school completion, an associate's degree, a bachelor's degree, a master's degree, and a doctor's degree. Full-time, year-round workers were selected as a data sample as the income of full-time, year-round workers is the data generally utilized when analyzing and discussing a gender wage gap.

As such, the variables of this data are:

- Gender
- Education attainment
- Income

The nominal variables are gender and education attainment. The dependent variable is income. The variable of gender is based on males and females in the United States. The variable of education attainment is based on highest level of degree attained, as discussed previously: high school completion, A.A., B.A., M.A., P.H.D. The variable income is based on real median earnings and earnings ratio.

### *Data Collection*

The quantitative data utilized for this study is from one source of existing data. The data was obtained through a basic internet search. The data set is sourced from the National Center of Educational Statistics, the primary federal entity for census data relating to education. The data set consists of median earnings for male-female full time, year-round workers age 25 years and older by highest level of education attainment. Both male and female data will be utilized for this study. The selected years within this data set are from 1990 through 2009. For the purpose of this study, the data that will be utilized will be from the years 1991 through 2009, as year 1990 did not have full data available. The division of levels of education attainment within this data set consists of: less than 9th grade, some high school/no completion, high school completion, some college/no degree, associate's, bachelor's, master's, first-professional, and doctor's. For the purpose of this study, the levels of education within this data that will be utilized will be high school completion, associate's, bachelor's, master's, and doctor's degrees.

### *Data Analysis*

In order to address the research question, and make an assessment in relation to the trends of male-female and female-female education attainment and income, this study will conduct a comparison analysis utilizing the existing data set and the three variables, as noted previously, of gender, education attainment, and income. The analysis will focus primarily on male-female comparisons of incomes by level of education attainment; and the analysis will also focus on comparisons of female incomes by level of education attainment. The three variables consist of two independent variables and one dependent variable. The two independent variables are gender and education attainment. The analysis uses male-female highest level of education attainment in

the United States, in terms of a high school completion, A.A., B.A., M.A., and P.H.D., from the years 1991-2009. The dependent variable is income, or earnings. The analysis uses the median amount of income, or earnings, for male-female full time, year-round workers age 25 years and older by level of education attainment.

### *Chapter 4: Results and Discussion*

As explained in the previous chapter, in conducting this research, two comparison analyses were made: male-female education attainment and income, and female-female education attainment (high school completion versus higher education attainment) and income.

#### *Results*

##### *Male-Female Education Attainment and Income:*

Exhibit 1-1 is a line graph that demonstrates the trends and comparisons in income for males and females with highest level of education being high school completion through the years 1991 through 2009. Although this graph demonstrates a constant increase in earnings for both sexes, it also demonstrates a constant wage gap, showing females with similar education to that of men consistently earning less than men.

Exhibit 1-2 is a line graph that demonstrates the trends and comparisons in income for males and females with highest level of education being an associate's degree through the years 1991 through 2009. Although this graph demonstrates a constant increase in earnings for both sexes, it also demonstrates a constant wage gap, showing females with similar education to that of men consistently earning less than men.

Exhibit 1-3 is a line graph that demonstrates the trends and comparisons in income for males and females with highest level of education being a bachelor's degree through the years 1991 through 2009. Although this graph demonstrates a constant increase in earnings for both

sexes, it also demonstrates a constant wage gap, showing females with similar education to that of men consistently earning less than men.

Exhibit 1-4 is a line graph that demonstrates the trends and comparisons in income for males and females with highest level of education being a master's degree through the years 1991 through 2009. Although this graph demonstrates a constant increase in earnings for both sexes, it also demonstrates a constant wage gap, showing females with similar education to that of men consistently earning less than men.

Exhibit 1-5 is a line graph that demonstrates the trends and comparisons in income for males and females with highest level of education being a doctorate's degree through the years 1991 through 2009. Although this graph demonstrates a constant increase in earnings for both sexes, it also demonstrates a constant wage gap, showing females with similar education to that of men consistently earning less than men.

Exhibit 1-6 is a table that demonstrates the trends and comparisons in ratios of female to male income through the years 1991 through 2009 by similar level of education attainment: high school completion, associate's degree, bachelor's degree, master's degree, and doctorates degree. This table demonstrates the yearly changes in ratios.

Indicated by the trend analysis graphs in exhibits 1-1 through 1-4, when considering male-female education attainment and income, a significant gender wage gap continued to exist on all levels of education attainment. Men continued to earn more than women with similar education attainment in terms of high school completion, A.A., B.A., M.A. and P.H.D.

Throughout the 19 year time period, the gender wage gap remained fairly steady for all education

attainment comparisons. For the most part, each comparison demonstrated gender wage gaps that hovered in the seventy percentage range. Based on this analysis, it appears that female higher education attainment does not necessarily play a significant role in decreasing the gender wage gap.

Exhibit 1-1

Male and Female Trend Graph of Earnings, Highest Level of Education Attainment High School, from Years 1991-2009

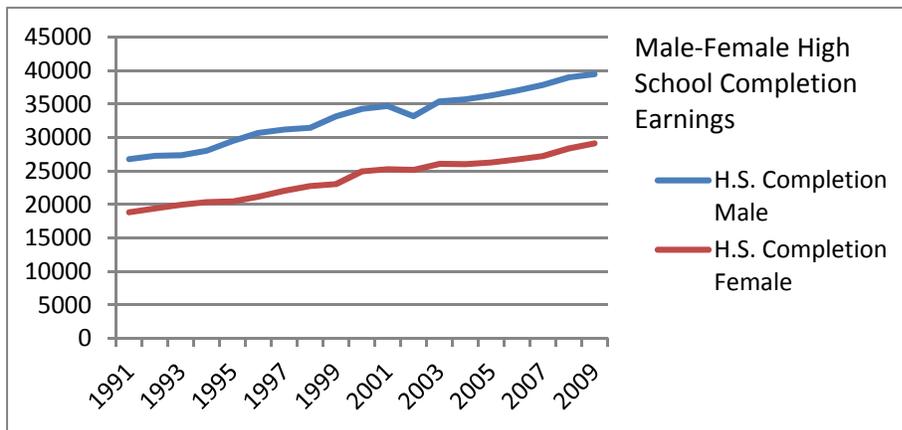


Exhibit 1-2

Male and Female Trend Graph of Earnings, Highest Level of Education Attainment Associate's Degree, from Years 1991-2009

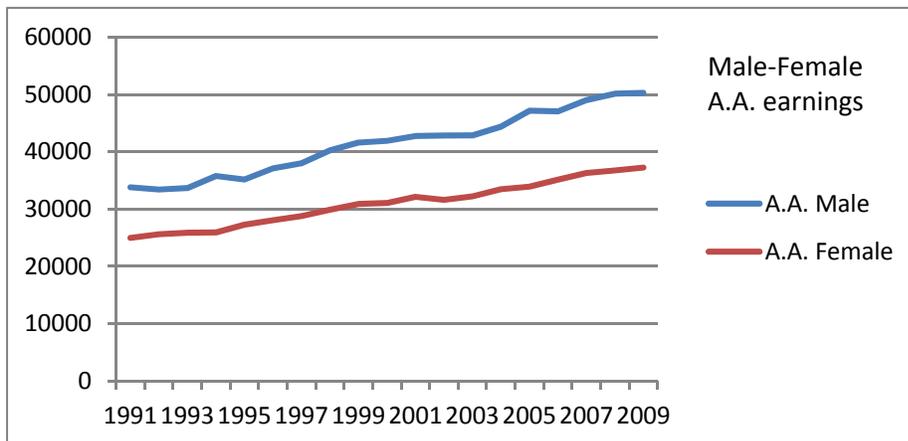


Exhibit 1-3

Male and Female Trend Graph of Earnings, Highest Level of Education Attainment Bachelor's Degree, from Years 1991-2009

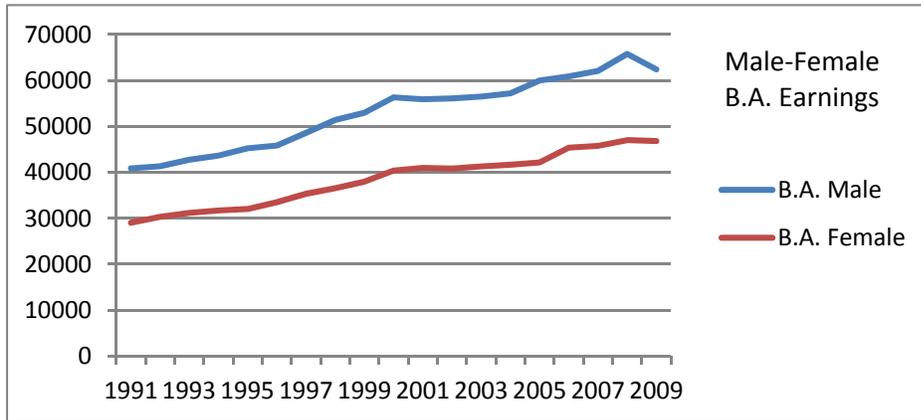


Exhibit 1-4

Male and Female Trend Graph of Earnings, Highest Level of Education Attainment Doctorate's Degree, from Years 1991-2009

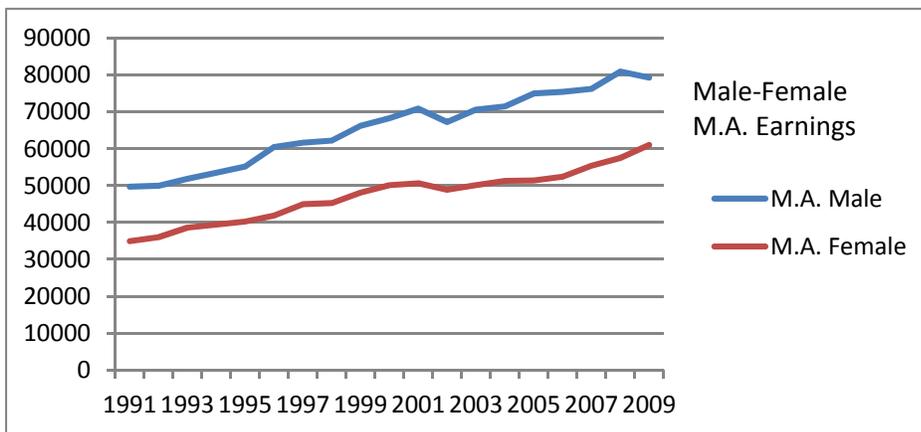


Exhibit 1-5

Male and Female Trend Graph of Earnings, Highest Level of Education Attainment Doctorate's Degree, from Years 1991-2009

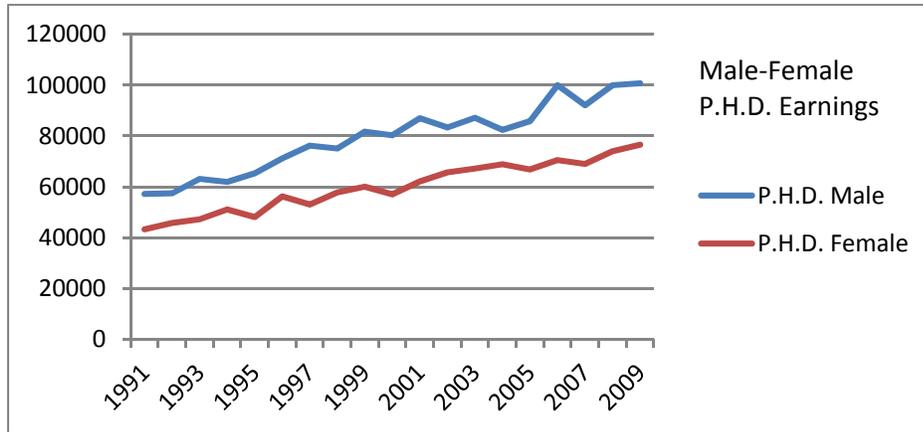


Exhibit 1-6

Ratios of Female Earnings to Men Earnings by Level of Education Attainment (High School, Associate’s, Bachelor’s, Master’s, Doctorate’s), Years 1991-2009

	H.S.	A.A.	B.A.	M.A.	P.H.D.
Year	Ratio	Ratio	Ratio	Ratio	Ratio
1991	0.70	0.74	0.71	0.70	0.76
1992	0.71	0.77	0.73	0.72	0.80
1993	0.73	0.77	0.73	0.74	0.75
1994	0.73	0.72	0.73	0.74	0.83
1995	0.69	0.78	0.71	0.73	0.74
1996	0.69	0.76	0.73	0.69	0.79
1997	0.71	0.76	0.73	0.73	0.70
1998	0.72	0.74	0.71	0.73	0.77
1999	0.69	0.74	0.72	0.73	0.74
2000	0.73	0.74	0.72	0.73	0.71
2001	0.73	0.75	0.73	0.71	0.71
2002	0.76	0.74	0.73	0.73	0.79
2003	0.74	0.75	0.73	0.71	0.77
2004	0.73	0.75	0.73	0.72	0.84
2005	0.72	0.72	0.70	0.69	0.78
2006	0.72	0.75	0.75	0.70	0.71
2007	0.72	0.74	0.74	0.73	0.75
2008	0.73	0.73	0.71	0.71	0.74
2009	0.74	0.74	0.75	0.77	0.76

*Female-female Education Attainment and Income*

Exhibit 2-1 is a line graph that demonstrates the trends and comparisons in income for females with highest level of education being high school completion versus females with highest level of education being an associate's degree through the years 1991 through 2009. Although this graph demonstrates a constant increase in earnings for both levels of education attainment, it also demonstrates a constant wage gap, showing females with high school completion consistently earning less than females with an associate's degree.

Exhibit 2-2 is a line graph that demonstrates the trends and comparisons in income for females with highest level of education being high school completion versus females with highest level of education being a bachelor's degree through the years 1991 through 2009. Although this graph demonstrates a constant increase in earnings for both levels of education attainment, it also demonstrates a constant wage gap, showing females with high school completion consistently earning less than females with a bachelor's degree.

Exhibit 2-3 is a line graph that demonstrates the trends and comparisons in income for females with highest level of education being high school completion versus females with highest level of education being a master's degree through the years 1991 through 2009. Although this graph demonstrates a constant increase in earnings for both levels of education attainment, it also demonstrates a constant wage gap, showing females with high school completion consistently earning less than females with a master's degree.

Exhibit 2-4 is a line graph that demonstrates the trends and comparisons in income for females with highest level of education being high school completion versus females with highest level of education being a doctorate's degree through the years 1991 through 2009. Although this graph demonstrates a constant increase in earnings for both levels of education

attainment, it also demonstrates a constant wage gap, showing females with high school completion consistently earning less than females with a doctorate's degree.

Exhibit 2-5 is a table that demonstrates the trends and comparisons in ratios of income for females with highest level of education being high school completion to females with higher education: associate's degree, bachelor's degree, and doctorate's degree. This table demonstrates the yearly changes in ratios for each comparison.

The comparison of female-female education attainment and income, in terms of high school completion versus higher education attainment, demonstrated more intriguing results than that of the latter. In comparing female high school completion versus female higher education attainment, there was a significantly large wage gap for all levels of higher education attainment, which included an A.A., B.A., M.A., and P.H.D. Women with a higher education had a significantly higher income than those with only high school completion. For the comparison of women with high school completion versus women with a B.A., the wage gap hovered around the sixty percentage range; and this percentage range decreased significantly for the higher levels of degrees. Meaning the higher the level of degree attainment, the larger the wage gap became when compared to high school completion. For each level of higher education attainment versus high school completion in this analysis, the wage gap seemed to be widening throughout the 19 year time period. Based on this analysis, although female higher education attainment may not play a significant role in decreasing the gender wage gap, it does appear that higher education attainment is beneficial for women in terms of earning higher incomes.

Exhibit 2-1

Female Trend Graph of Earnings, Highest Level of Education Attainment High School versus Associate’s Degree, from Years 1991-2009

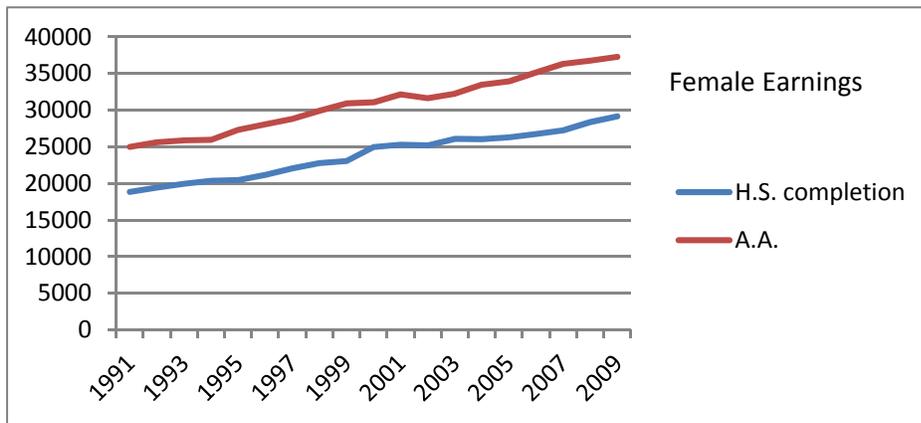


Exhibit 2-2

Female Trend Graph of Earnings, Highest Level of Education Attainment High School versus Bachelor’s Degree, from Years 1991-2009

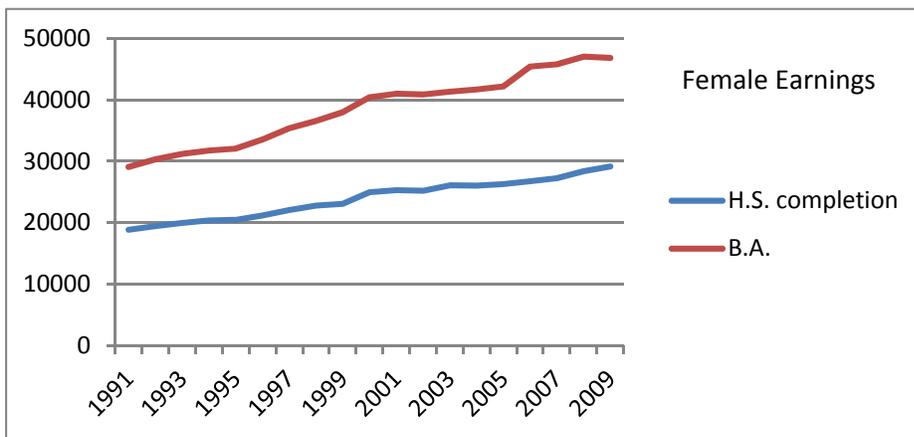


Exhibit 2-3

Female Trend Graph of Earnings, Highest Level of Education Attainment High School versus Master’s Degree, from Years 1991-2009

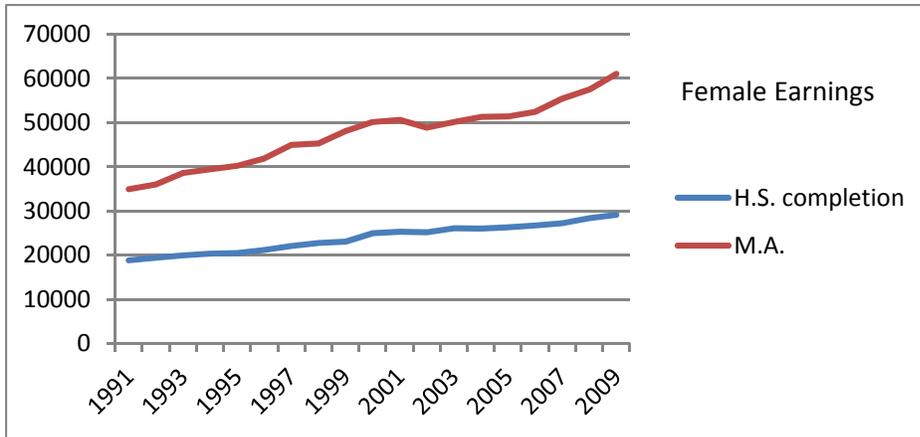


Exhibit 2-4

Female Trend Graph of Earnings, Highest Level of Education Attainment High School versus Doctorate’s Degree, from Years 1991-2009

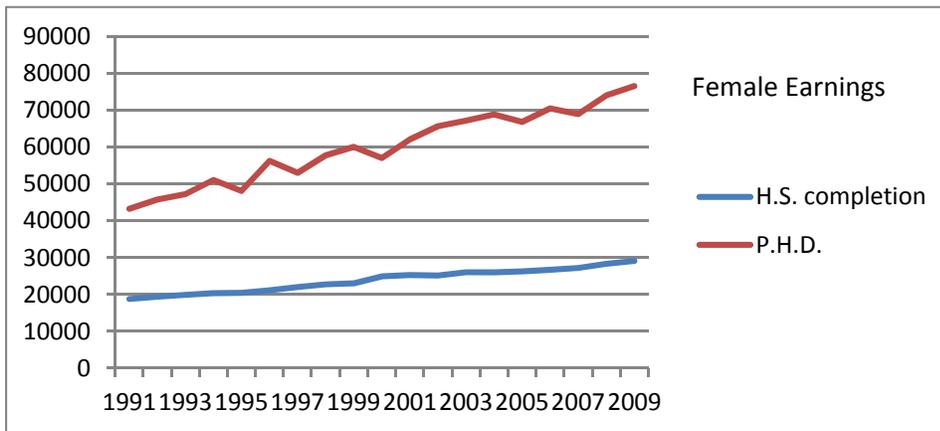


Exhibit 2-5

Ratios of Female with High School Completion Earnings to Female with Higher Education Attainment Earnings by Level of Higher Education Attainment (Associate’s, Bachelor’s, Master’s, Doctorate’s), Years 1991-2009

	Ratio to A.A.	Ratio to B.A.	Ratio to M.A.	Ratio to P.H.D.
1991	0.75	0.65	0.54	0.44
1992	0.76	0.64	0.54	0.42
1993	0.77	0.64	0.52	0.42
1994	0.79	0.64	0.52	0.40

1995	0.75	0.64	0.51	0.43
1996	0.75	0.63	0.51	0.38
1997	0.77	0.62	0.49	0.42
1998	0.76	0.62	0.50	0.39
1999	0.75	0.61	0.48	0.38
2000	0.80	0.62	0.50	0.44
2001	0.79	0.62	0.50	0.41
2002	0.80	0.62	0.52	0.38
2003	0.81	0.63	0.52	0.39
2004	0.78	0.62	0.51	0.38
2005	0.77	0.62	0.51	0.39
2006	0.76	0.59	0.51	0.38
2007	0.75	0.60	0.49	0.39
2008	0.77	0.60	0.49	0.38
2009	0.78	0.62	0.48	0.38

### *Discussion*

Female higher education attainment is beneficial for women; however, it does not significantly decrease the gender wage gap. It appears this irony can be contributed to some of the more accredited theories previously discussed in the literature review, which would include gender preferences, and childbearing and motherhood's impact on women's lifetime work and career choices. Therefore, it appears higher education cannot be its own sole factor in decreasing the gender wage gap.

For stakeholders, which would primarily include women, researchers, and public officials, this study provides implications that the gender wage gap is a multi-dimensional phenomenon; and this research confirms it is a phenomenon comprised of multiple conclusions. Higher education is an important asset for women in terms of earning higher incomes, but it cannot be perceived as the sole factor in resolving the gender wage gap.

## *Chapter 5: Summary, Conclusions, and Recommendations*

### *Summary of the Study*

The study was performed to answer the following research question:

- Does female higher education attainment significantly contribute to decreasing the gender wage gap?

The gender wage gap is a complex issue that has continued to have a noticeable impact on society. Based on the phenomenon of women increasingly entering the higher education sector and exceeding men in various aspects of the higher education sector, this study is of importance in order to analyze how female higher education attainment may relate to the gender wage gap. The study consisted of first conducting a literature review of the historical and theoretical perspectives on the gender wage gap. It was noted, from prior research, that women have made significant strides in terms of social and economic status throughout history, increasingly entering the labor force and increasingly contributing to their household incomes. It was also determined that various factors have been found to potentially play a role in the gender wage gap, the most prominent factors being gender preference, and childbearing and motherhood. The methods utilized to attempt to answer the research question consisted of a time-series, comparison analysis of male-female education attainment and income, as well as female-female education attainment and income, in terms of high school completion versus higher education attainment. Quantitative data from the National Center of Educational Statistics was utilized to complete this study.

### *Conclusions*

The results indicated:

1. Female higher education attainment, solely, does not significantly contribute to decreasing the gender wage gap.
2. Female higher education attainment is significantly beneficial to women in terms of earning higher incomes.

The time-series, comparison analysis of female-female education attainment (high school versus higher education) and income brought forth much more interesting results than that of male-female education attainment and income. The wage gap for the male-female analysis was significant, hovering in the seventy percentage range. There was a significantly large wage gap between females with high school completion and females with higher education attainment; and the higher the level of education attainment, the more significant the gap. As such, it was determined that the gender wage gap is a multi-dimensional issue in which various factors can be taken into account.

### *Recommendations*

The gender wage gap is a pertinent issue in today's society. Although female higher education attainment, solely, did not significantly contribute to decreasing the gender wage gap, it was found pertinent to females in terms of earning higher education incomes. Therefore, in further research, it would be recommended to analyze female higher education attainment and the gender wage gap multi-dimensionally, to determine to what extent higher education attainment plays a role in relation to the various other factors that potentially contribute to the gap.

Another recommendation would be to further research the significantly large wage gap between females with high school completion versus females with higher education attainment to increase the understanding of this staggering phenomenon.

This study may provide a greater understanding on how female higher education attainment relates to the gender wage gap and the benefits a higher education poses for women in today's society.

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*Appendix A: IRB Letter*



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**Date:** 2 November 2015  
**To:** Crystal Romero, MPA Student Investigator  
**cc:** Jinping Sun, MPA Faculty Sponsor  
 Roseanna McCleary, IRB Chair  
**From:** Isabel Sumaya, Research Ethics Review Coordinator

**Subject: Protocol 15-101: Not Human Subjects Research**

Thank you for bringing your protocol, "Women in Higher Education and the Gender Wage Gap", to the attention of the IRB /HSR. On the form, "Is My Project Human Subjects Research?", received on November 2<sup>nd</sup>, 2015, you indicated the following:

I want to interview, survey, systematically observe, or collect other data from human subjects, for example, students in the educational setting. **NO**

I want to access data about specific persons that have already been collected by others [such as test scores or demographic information]. Those data can be linked to specific persons [regardless of whether I will link data and persons in my research or reveal anyone's identities]. **NO**

Given this, your proposed project will not constitute human subjects research. Therefore, it does not fall within the purview of the CSUB IRB/HSR. Good luck with your project.

If you have any questions, or there are any changes that might bring these activities within the purview of the IRB/HSR, please notify me immediately at 654-2381. Thank you.

Isabel Sumaya, University Research Ethics Review Coordinator