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Spatial variations in gender income differentials

Zorn, Jenny Jane, Ph.D.
The Ohio State University, 1990

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Spatial Variations
in Gender Income Differentials

DISSERTATION

Presented in Partial Fulfillment of the Requirements for
the Degree Doctor of Philosophy in the Graduate
School of The Ohio State University

By
Jenny J. Zorn, B.A., M.A.

... ...

The Ohio State University
1990

Dissertation Committee:
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Howard Gauthier, Ph.D.
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Approved by

Advisor
Department of Geography
DEDICATION

To my parents
I thank my parents for arousing my interest in geography and the surrounding world through our many travels. My mother was a bright, inquisitive, and generous soul who opened my mind and heart to many opportunities in life. My father is a strong, wise, and proud man whose value of education has inspired me to persevere when I was most doubtful. I thank them with all my heart for the opportunities they have given me and for their love and constant support that has carried me through some of the toughest times.

Emilio Casetti always supported me and my desires without imposing his own presuppositions. His wisdom and insightful ideas were always given freely, yet the choices were always my own. I sincerely respect him and admire his high standard of ethics and his professionalism. He is responsible for improving the quality and integrity of the research.

Randy Smith has been a constant support and guide for me since I first entered the program at Ohio State. I thank him for his positive influence in my career in geography. He has consistently given me his support and his keen geo-
graphic knowledge. My first teaching experiences were with Howard Gauthier who inspired me with his lecturing talents. I thank him for developing the teacher in me. My initial spark of interest in geography as a discipline came from John Kistler during my undergraduate program. His excitement for the world and environment, his true love of life, and his sincere concern and interest in people are his greatest assets.

Throughout the research of this dissertation Kavita Pandit gave comments, interpretations, and guidance. I thank her for her help specific to the dissertation and for her love and support as a friend.

I thank the Geography Department and the University Libraries at The Ohio State University which provided the financial support for my graduate studies. In addition, I thank Joe Damico and Fred Ruland who helped me work through all of the computer problems associated with employing such large data sets.

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I thank Amy Zorn specifically for her editing of the dissertation. Thank you for showing me the value of the written word. It is hard to believe I put down the paper puncher, the mixing bowl filled with 7-up, and the baseball glove long enough to write a dissertation. Tim Zorn and family provided escapes to "normal" life which helped me maintain my sanity. I cheer you today as much as I did years ago.

And to Andy Copeland. You have given me laughter, strong shoulders, and a warm, comfortable, and happy life. I respect your strength, intellect, open mind, and acceptance of different ideas and people. You supported me through many, many difficult times with the dissertation and with life. I love you very much. Thank you.
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FIELD OF STUDY

Major Field: Geography
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CHAPTER I
INTRODUCTION

The labor market in the United States has changed dramatically in the past few decades as more and more women are entering the paid labor force. This influx of women into the paid work force has been accompanied by changes in the structure of the family. The traditional married-couple family with a male as the head of the household is no longer the norm. More women are assuming the role as head of the household, and, therefore, more women have greater financial responsibilities. Hence, more women have entered the paid labor force to fulfill these financial obligations.

Women have assumed the same financial responsibilities as men but have not received the same economic rewards. Women continue to earn less than men. Their financial responsibilities are similar to those of men, but their income levels continue to lag behind. Changes in the paid labor force and the structure of the family have been dramatic, however, changes in gender wage gaps have been minimal.
This persistence of gender wage gaps has been the focus of numerous studies. Gender wage gaps have been investigated by various social scientists using many different methodological approaches. Previous studies tended to examine gender wage gaps and their determinants, investigating the effects of differing factors on income. These studies focused on identifying the relationships between gender wage gaps and their determinants.

The intent of this research is not only to examine the relationships associated with gender wage gaps but also to investigate the drift in these relationships across space. The implications of place on the relationships associated with gender wage gaps is the focus of this research. The characteristics of the socio-economic environment affect these relationships, and they affect them differently for men than for women. Given the same environment women, vis-à-vis men, experience different impacts on their income as a result of their individual characteristics.

A major component of this study is the creation of a mechanism for estimating individual incomes for specific persons in distinctive environments. Estimated incomes for women are compared to income estimates for men and the resulting gender differentials in those income estimates are investigated. This establishes the mechanism towards future investigations of the relationships involved in gen-
nder wage gaps. The basis of this work is establishing the groundwork of a mechanism for identifying the macro-level relationships associated with gender wage gaps. Future research can build from this framework and develop various directions for further investigations.

Another major objective of this research is the creation of the data sets for use in further investigations of gender wage gaps. The data sets created for this research include an extremely large data set which poses special difficulties in the analyses. It is a unique data set by virtue of its size of nearly 800,000 cases. The size of the data set increases the credibility of a research.

The other components of the study are the testing of hypotheses and examining empirical patterns in the data. Several hypotheses regarding the macro-level relationships of gender wage gaps at the micro-level are presented and tested. The specific effects of context on the relationships between the individual's characteristics and his/her income are examined. Gender variations in the empirical patterns of these contextual effects are investigated. The intent of the research is to provide a clearer understanding of the statistically significant dimensions of the realities associated with gender wage gaps.
1.1 FRAMEWORK OF THE STUDY

This study examines not only the relationships between the individual's characteristics and his/her income but also how the macro-level environment impacts on those micro-level relationships. Specifically, the focus of this study is investigating how the micro-level relationships drift across different metropolitan environments. These relationships at both the micro-level and macro-level are affected by the changing patterns of the participation of women in the paid labor force.

In recent years, more and more women are entering the paid labor force. This feminization of the paid labor force has created a focal point for a large body of research. Accompanying this feminization of the paid labor force has been the changing structure of the family and the feminization of poverty. More women are working in the paid labor force, more are heads of households, and more are impoverished.

Women are assuming greater financial responsibilities as the head of a family or household. Increasingly more women are no longer the secondary earner or unemployed wife in a traditional married-couple household. They provide the primary source of income for their families and many are the only source of income for their family. They are single mothers raising and caring for their children without financial assistance from the children's fathers.
Even within dual-career families they are assuming greater financial responsibilities. Increasingly more husbands are the secondary earners in the family and the trailing spouses in job searches. Many dual-career families need both incomes in order to fulfill their financial responsibilities. The woman's income is just as important to the family as is the man's income.

As these women assume greater financial responsibilities, their financial status is declining. The number of women below the poverty line has dramatically increased in recent years. More and more women are becoming impoverished creating the feminization of poverty. As single mothers, displaced homemakers, and elderly widows they are increasingly dropping below the poverty line.

More women are working in the paid labor force, yet the low wages they receive exacerbate the problems associated with the increase in their assumption of financial responsibilities. Women fail to earn as much as men. Gender wage gaps continue to persist at times when women are assuming greater financial responsibilities which require higher income levels. Women are assuming the financial responsibilities previously assumed only by men, but they are not receiving the same pay as men.

Improvements in gender wage gaps have not paralleled the influx of women into the paid labor force. The increase in
participation rates of women in the paid labor force would seem to indicate advancements in the status of women, however, the minimal improvements in gender wage gaps indicate little improvement in the status of women. The paid labor force has significantly changed in the last thirty years, yet gender wage gaps have changed very little. The feminization of the paid labor force has brought about many changes in that work force, but changes in gender wage gaps have lagged far behind.

Many studies have addressed gender wage gaps and examined the causes attributed to their persistence. These studies reach across many disciplines, approach gender wage gaps from varying theoretical perspectives, utilize different methodological approaches, and employ numerous data sets. Many of these studies have focussed on accounting for the wage disparity and the relationships associated with it.

This research examines the spatial variations in the relationships associated with gender wage gaps. A desirable aspect of this research is its examination of contextual impacts on the micro-level relationships. The relationships associated with gender wage gaps are not the same everywhere. The context of place affects the micro-level relationships. The relationships associated with gender wage gaps are different in areas with more progressive
attitudes than in areas with more traditional lifestyles. Therefore, this research does not remove the relationships from their environment, rather it addresses the impacts of that environment on the micro-level relationships.

Within the scope of this research the environment is defined as a metropolitan area. The environment of a larger, more progressive and diverse metropolitan area provides different opportunities for men than for women. In larger metropolitan areas the incomes are generally higher for all people. However, it is expected that the more progressive attitudes, lifestyles, and employment practices create greater advantages for women, vis-a-vis men, in larger metropolitan areas. Women are more likely to receive lower incomes in more traditional metropolitan areas because of the fewer opportunities, the less progressive attitudes, and the predominance of traditional married-couple family lifestyles.

To identify gender variations in these drifts across metropolitan areas two models are estimated: one for men and one for women. The female model identifies the effects that the environment has on the relationships between a woman's income and her income determinants. The male model represents the same patterns for a man and, thus, gender variations in these relationships are revealed.
The methodological framework employed to identify these variations in the effects of the macro-level environment on the relationships at the micro-level is the Expansion Method (Casetti, 1972). The Expansion Method can be used to investigate the impact of context on micro-level relationships. In studies of gender wage gaps it is desirable to examine contextual impacts on relationships, rather than remove the relationships from their environment and assume the context has no effect on them. The Expansion Method seeks to specify suitable relationships between gender wage gaps and their determinants and thus, to investigate the environmental impacts on these relationships. Certainly a person receives different financial remuneration based not only on his/her individual attributes but also on the characteristics of his/her environment.

Micro-level relationships are impacted by macro-level contextual characteristics. In this application of the Expansion Method, the same initial model identifying the micro-level relationships associated with incomes for males and females is selected. Then this model is examined for contextual variation. To this effect the terminal models produced for each gender reflect not only the initial micro-level relationships but also the drifts in those relationships across space. The two terminal models (one for females, one for males) obtained are used to determine
the estimated income for any individual with specific attributes in an environment with particular characteristics.

Therefore, an individual can identify his/her estimated income based on his/her personal attributes and the characteristics of the metropolitan area in which he/she resides. Estimated incomes for individuals and the drifts in these incomes across different metropolitan areas is identified. A comparison of the female model and the male model reveals gender variations in these drifts. The result is the identification of 1) the micro-level relationships associated with both male and female wages, 2) the drifts in these relationships across metropolitan areas, and 3) the gender variations in these drifts.

Because the model investigates both macro-level characteristics and micro-level attributes, two data sets are employed. The macro-level data set includes summary level data that identify the social and economic attributes of the 317 metropolitan areas in the United States, e.g., per capita income and percent of the population that is non-white. The micro-level data set is composed of 800,000 individual records of persons residing within the metropolitan areas of the United States. It identifies the individual attributes of the persons, e.g., income and educational attainment level. Both data sets are extracted from the 1980 United States Census.
While the size of this micro-level data set enhances the quality of the research, it also creates substantial problems with the manipulations and statistical analyses. A data set of this magnitude is difficult to manage and requires several adjustments within the statistical analyses and computer access for the calculations. The required computer time and work space is massive and necessitates several creative uses of the mainframe's capabilities.

1.2 STRENGTHS AND DISTINCTIVE QUALITIES OF THE RESEARCH

The research design of this study provides several strengths and distinctive qualities which create useful results. While the motivations of the research are directed towards the improvement of the status of women, the investigation is not an articulation of theories and ideologies but rather is designed to identify statistically significant dimensions of reality. The intent of the research is to identify the patterns and processes associated with gender wage gaps which lead to better understandings of the realities involved.

The presuppositions of ideological and theoretical perspectives is not the premise for this research. An identification of the empirical realities brought forth in the study form the basis of the research. The statistically significant patterns of reality that are revealed in the study provide the foundation of the research.
The research is also distinctive in its consideration of context. A valuable aspect of this research is the manner in which it addresses the issue of contextual variation. It examines not only the initial relationships between gender wage gaps and their determinants but also investigates the drifts in these relationships across space. It does not remove the relationships from the environment in which they operate, rather it investigates the impact of context on the relationships. The assumption is that relationships are not constant over time, space or other dimensions. In reality these relationships drift across environments.

The relationships associated with gender wage gaps are not constant over time or space. For example, the relationship between education and income may indeed be positive, but is that relationship the same in different time periods or in different environments? This research methodology does not merely include space as one of the variables in the relationships associated with gender wage gaps, rather it recognizes that the spatial context is a dimension which is the basis for variations in the relationships.

The study is inherently geographic in its sense of place. The idea of where you are and the context of that place is a driving factor in the establishment of the relationships. The spatial implications include the idea that a
sense of place is the underlying force in the drifts of the relationships from place to place. The study is implicitly spatial in this regard.

The other distinctive quality of this research is the size of the micro-level data set. The implication of a large data set is that any of the questions posed are answered from a vantage point that is greatly representative of the realities in the United States. Smaller sample sizes increase the risks of generalizations which are not representative of the entire population. Generally, the larger the data set, the more accurately the data represent the total population. Therefore, the data are more likely to accurately represent all persons. The small nuances of variations in individuals are not lost. However, in a smaller data set the number of people that a respondent represents is increased, and the resulting data set is less accurate in representing all persons.

Therefore, the answers to the questions of this study which uses an extremely large data set are based on more credible results. The research employing large data sets is within an inferential framework which is greatly enhanced by the magnitude of the number of respondents. This results in answers which are not vitiated by noise or random error to the degree that they are in studies utilizing smaller data sets and different approaches. The reli-
ability of the findings is increased by the use of the largest data set available. A data set with a sample of nearly 800,000 cases is extraordinarily unique and brings dramatically enhanced credibility and value to the research.

1.3 FORMAT FOR THE DISSERTATION

The organization of this dissertation begins with a discussion of the background themes relevant to the study. This section includes a discussion of the participation of women in the paid labor force, the changes in the structure of the family, the feminization of poverty, and the difference in pay between men and women. Its intent is to provide an overall understanding of the changes occurring in the paid labor force. The changing status of women in the United States paid labor force affects the relationships associated with gender wage gaps.

The next chapter reviews other previous research on gender wage gaps and the empirical evidence these studies revealed. A discussion of other research designs that incorporate different methodological approaches, ideological frameworks, theoretical perspectives, and applicable data sets is included in this chapter. The chapter concludes with comments on the expectations of the research and a presentation of the hypotheses set forth for testing.
The methodological framework employed to test these hypotheses and expectations is introduced in the fourth chapter. The methodological approach described in this chapter is the Expansion Method. An explanation of the Expansion Method is included with examples of other studies that are constructed based on this research philosophy. Justifications for why and how the Expansion Method is appropriate for this research are discussed. This chapter also includes a simplified example drawn from this research which helps clarify the Expansion Method and its use in this research design.

The fifth chapter presents the data sets involved in the research. The macro-level data set of the 317 metropolitan areas in the United States includes socio-economic variables identifying the characteristics of these metropolitan areas. The micro-level data set contains nearly 800,000 cases of attributes of the individual respondents. Both data sets are drawn from the 1980 United States Census. This chapter identifies the problems associated with utilizing and employing such large data sets.

The analyses and results of the research are identified and discussed in the sixth chapter. The effects of each of the macro-level variables on the relationships associated with gender wage gaps is separately estimated. A discussion of each of these macro-level impacts is presented.
The final pair of terminal models (one for each gender) reveals the relationships present in a metropolitan area with certain attributes. A composite metropolitan area can be defined and the effects of its environment on the relationships associated with an individual's income are identified. The gender wage gap is revealed in a comparison of the female and male models. A presentation of several typical cases concludes the analyses chapter.

The final chapter discusses how this research moves towards a greater understanding of gender wage gaps and the relationships associated with them. An overview of the study and the conclusions of the research are presented and discussed. In addition, directions for future research focusing on understanding the relationships (at both the macro-level and micro-level) associated with gender wage gaps is presented.
CHAPTER II
WOMEN IN THE PAID LABOR FORCE

This research examines the relationships associated with gender wage gaps as they drift across different social and geographical contexts. First, a general understanding of the broader context is useful. Before investigating the relationships associated with gender wage gaps it is beneficial to first identify the trends involved with their persistence.

Today studies of gender wage gaps are more valuable because more and more of the members of the paid labor force are women. Their significance also increases as more women assume greater financial responsibilities that require greater income levels. Because women and men have similar financial responsibilities yet dissimilar incomes, many women are impoverished creating a feminization of poverty.

The United States labor market has changed significantly in recent years because more and more women are working for pay outside of the home. The structure of the labor market is changing and societal adjustments are widespread. The
influx of women into the paid labor force has caused economic, social, psychological, and familial changes in the work place, at home, and throughout society.

With more wives working outside the home the domestic responsibilities and childrearing duties become issues of concern. The question is: Who will perform those duties traditionally assumed by homemaker wives? Dual career families face decisions regarding who will be the trailing spouse in the jobs search strategy. Financially, many of these families require both incomes in order to "get by."

Not only are married women entering the paid labor force in larger numbers, but single mothers compose a larger portion of the paid labor force than ever before. More and more families are headed by single females who are full-time workers supporting their families. These women often assume all the responsibilities of the family. They are the breadwinners and caretakers: the sole means of support both economically and emotionally. The duties are not shared with a spouse. They do it all alone.

The increase in the number of dual career families and single parent families force employers to consider providing workers with day care facilities, spouse relocation programs, flex-time, job sharing opportunities and other programs. These changes in the work place are a result of this influx of women into the paid employment arena.
The status of women in society is changing as a result of the increase in their participation in the paid labor force, the feminist movement, and the changing family structure. More women are working outside the home to solely support their own families or to join their husbands in the financial responsibility.

This heightened awareness of women's issues and the status of women would suggest a betterment of the condition of women. However, the condition is not improving. Women still make only 62% of what men receive in the paid labor force. Women continue to cluster in lower paying jobs. The subordination of women persists as both women and men continue to envision women in subservient roles. Although society is more aware of this situation, the pattern remains.

2.1 THE FEMINIZATION OF THE PAID LABOR FORCE

In recent years the number of women working outside of the home has escalated. By 1980, almost half of all adult women were active participants in the paid work force. Whereas in 1950, less than a third of all women were working outside the home. At the same time the participation rates for males actually decreased 6.4 percentage points. In those three decades women were stepping out of their traditional homemaker roles and entering the paid labor
force in astounding numbers. Millions of women were joining the paid work force. In 1950, 16.4 million women were in the paid labor force and by 1980 there were 44.7 million. This 172% increase is dramatically higher than the 44% increase the males made (Table 1).

The paid work force grew during this time period largely because more and more women were joining the payrolls. The feminization of the paid labor force was evident. Almost half (42.1%) of all workers were female by 1980. The paid labor force was changing. The traditional male breadwinner with a homemaker wife was no longer the norm. Women were earning a living by choice and out of necessity.
Table 1
Paid Labor Force Participation By Sex

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>females in paid labor force (in mil.)</td>
<td>16.4</td>
<td>22.2</td>
<td>30.5</td>
<td>44.7</td>
<td>28.2</td>
</tr>
<tr>
<td>females in the paid labor force/all females</td>
<td>29.9</td>
<td>35.7</td>
<td>41.4</td>
<td>49.9</td>
<td>20.0</td>
</tr>
<tr>
<td>males in paid labor force (in mil.)</td>
<td>42.8</td>
<td>47.0</td>
<td>51.5</td>
<td>61.4</td>
<td>18.7</td>
</tr>
<tr>
<td>males in paid labor force/all males</td>
<td>81.5</td>
<td>80.4</td>
<td>76.6</td>
<td>75.1</td>
<td>6.4</td>
</tr>
<tr>
<td>persons in paid labor force (in mil.)</td>
<td>59.2</td>
<td>69.2</td>
<td>82.0</td>
<td>106.1</td>
<td>46.9</td>
</tr>
<tr>
<td>females in paid labor force/total paid labor force</td>
<td>27.8</td>
<td>32.1</td>
<td>37.2</td>
<td>42.1</td>
<td>14.3</td>
</tr>
</tbody>
</table>

2.1.1 Age Variations

These women were entering the paid labor force during their childbearing years. The per cent of women with school age children who were in the paid labor force increased from approximately 30% in 1950 to 62% in 1980. Even women with young children and babies increased their participation rates from 12% to 45% in this time period (U. S. Bureau of the Census, 1983).1 More mothers were members of the paid labor force in the 1960s and the 1970s.

Women of all ages were entering the paid labor force. More young women were entering the paid labor force before bearing children, more young mothers were working outside the home, more women who had completed their childbearing were employed and more senior citizens were working for pay. Even though women of all ages were entering the paid labor force in larger numbers, the degree to which they did and the time period when they experienced their greatest increase varies across age cohorts.

In 1950 the participation rate of females was at its lowest, 29.9%. This increased in the 1950's largely due to the large number of 45-64 year old women who had completed their family responsibilities and were entering the paid labor force (Table 2). The overall increase in participa-

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1 Suzanne M. Bianchi and Daphne Spain (U.S. Bureau of the Census. 1983) give a good review of U.S. Department of Labor statistics on women. It is comparable to these census statistics.
tion rates for women was only 5.8%, but women aged 45-54 experienced a 13.8% increase in the rate of participation and those 55-64 increased 11.5. This illustrates that the initial increase in participation rates of women in the paid labor force was due to the influx of older women who were either entering the paid labor force for the first time or reentering after fulfilling childrearing responsibilities. All of the other age cohorts experienced much lower increases in participation rates in the 1950s.

Table 2

Paid Labor Force Participation Rates of Females by Age

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>29.9</td>
<td>35.7</td>
<td>41.4</td>
<td>49.9</td>
</tr>
<tr>
<td>16-19</td>
<td>31.1</td>
<td>32.6</td>
<td>34.9</td>
<td>45.8</td>
</tr>
<tr>
<td>20-24</td>
<td>42.9</td>
<td>44.8</td>
<td>56.1</td>
<td>67.8</td>
</tr>
<tr>
<td>25-34</td>
<td>31.8</td>
<td>35.3</td>
<td>44.9</td>
<td>64.8</td>
</tr>
<tr>
<td>35-44</td>
<td>35.0</td>
<td>42.7</td>
<td>50.3</td>
<td>64.7</td>
</tr>
<tr>
<td>45-54</td>
<td>32.9</td>
<td>46.7</td>
<td>52.5</td>
<td>58.8</td>
</tr>
<tr>
<td>55-64</td>
<td>23.5</td>
<td>35.0</td>
<td>42.1</td>
<td>41.6</td>
</tr>
<tr>
<td>65+</td>
<td>7.8</td>
<td>10.3</td>
<td>10.0</td>
<td>8.2</td>
</tr>
</tbody>
</table>

In the next two decades a whole new pattern emerged. Younger women with childrearing responsibilities began entering the paid labor force at higher rates. Women aged 20-24 showed the highest increase in participation rates in the 1960's, up 11.3 percentage points. The next highest increase was in the age group of 25-34-year-olds with a 9.6 percentage point increase and by the 1970's this age group increased at a rate of 19.9, more than twice that of the overall increase of 8.5.

Overall, the age variations in participation rates reveal an increasing feminization of the paid labor force in the 1950's due to the influx of older women into the paid work force. These women had fulfilled their childrearing duties and were entering the paid labor force in larger numbers. In the next two decades younger women began a much larger influx into the paid labor force driving up the participation rates for all women. A large percentage of these women were mothers.

2.1.2 Racial Variations
This recent increase in participation rates is due to the entry of white women into the paid labor force. Their participation rates grew at much higher rates. During all of the last three decades nonwhite women participated in the paid work force at higher rates than white women. Table 3 shows that the percentage of nonwhite females who were mem-
bers of the paid labor force was higher than for white females in each decade. The gap is closing. By 1980 over half, 52.9%, of all nonwhite females were paid members of the labor force and 49.4% of all white females. That decade also demonstrated an increase in the percentage of the female paid labor force that was nonwhite, up from 13.0% in 1970 to 16.2% in 1980.

Mott (1978) examined black women workers and found that the percentage working full-time has increased and they are receiving higher incomes. The black women who are working are, therefore, working longer hours and realizing higher incomes as a result.

Table 3
Paid Labor Force, Participation Rates of Females by Race

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>% of All Females</td>
<td>29.9</td>
<td>35.7</td>
<td>41.4</td>
<td>49.9</td>
</tr>
<tr>
<td>% of Nonwhite Females</td>
<td>38.5</td>
<td>43.7</td>
<td>47.2</td>
<td>52.9</td>
</tr>
<tr>
<td>% of White Females</td>
<td>29.0</td>
<td>34.8</td>
<td>40.6</td>
<td>49.4</td>
</tr>
</tbody>
</table>


Larger proportions of nonwhite women have been participants in the paid labor force longer than white women.
This new influx of women into the paid labor force is more a white female phenomenon than a new experience for non-white females.

An examination of age participation rates by race further explains this phenomenon. Table 4 displays age participation rates by race. In all but two of the age cohorts, nonwhite women have higher rates of participation in the paid labor force than white women. The only age groups where women of color have had lower rates is in the younger age groups. They have always had higher participation rates in the 25-years-and-older cohorts.

In the 1950's, the increase of older women entering the paid labor force was chiefly due to the influx of white women. White women showed their most dramatic increases in participation rates in the older age groups. The participation rates of 45-54-year-old white women increased 14 percentage points and 12.4 points for 55-64-year-olds, while the nonwhite females' rate increases were only 11.2 and 8.9, respectively (see Table 4).

During the last two decades the new influx of young females during their childbearing years has also been largely a white female phenomenon. Both younger white and nonwhite women were entering the paid labor force in higher rates than in previous years, but it was more pronounced for white women. The largest growth in participation rates
Table 4
Paid Labor Force Participation of Whites and Nonwhites by Age Cohort

<table>
<thead>
<tr>
<th></th>
<th>White</th>
<th>Nonwhite</th>
<th>White</th>
<th>Nonwhite</th>
</tr>
</thead>
<tbody>
<tr>
<td>1950</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16-19</td>
<td>32.1</td>
<td>24.0</td>
<td>33.8</td>
<td>23.9</td>
</tr>
<tr>
<td>20-24</td>
<td>43.4</td>
<td>39.5</td>
<td>44.7</td>
<td>45.5</td>
</tr>
<tr>
<td>25-34</td>
<td>30.3</td>
<td>44.3</td>
<td>33.5</td>
<td>48.6</td>
</tr>
<tr>
<td>35-44</td>
<td>33.4</td>
<td>48.5</td>
<td>41.1</td>
<td>55.8</td>
</tr>
<tr>
<td>45-54</td>
<td>31.8</td>
<td>43.5</td>
<td>45.8</td>
<td>54.7</td>
</tr>
<tr>
<td>55-64</td>
<td>22.9</td>
<td>31.4</td>
<td>34.5</td>
<td>40.3</td>
</tr>
<tr>
<td>65+</td>
<td>7.6</td>
<td>10.8</td>
<td>10.1</td>
<td>12.9</td>
</tr>
<tr>
<td>1970</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16-19</td>
<td>36.4</td>
<td>25.7</td>
<td>49.0</td>
<td>32.3</td>
</tr>
<tr>
<td>20-24</td>
<td>56.1</td>
<td>55.9</td>
<td>69.5</td>
<td>60.5</td>
</tr>
<tr>
<td>25-34</td>
<td>42.9</td>
<td>57.6</td>
<td>64.2</td>
<td>67.9</td>
</tr>
<tr>
<td>35-44</td>
<td>49.0</td>
<td>59.5</td>
<td>64.0</td>
<td>68.2</td>
</tr>
<tr>
<td>45-54</td>
<td>51.9</td>
<td>57.8</td>
<td>58.5</td>
<td>60.2</td>
</tr>
<tr>
<td>55-64</td>
<td>41.8</td>
<td>44.7</td>
<td>41.4</td>
<td>43.2</td>
</tr>
<tr>
<td>65+</td>
<td>9.8</td>
<td>13.0</td>
<td>8.0</td>
<td>10.0</td>
</tr>
</tbody>
</table>

for white women was an increase from 49.0 to 64.0 for 35-44-year-olds in the 1970's while the same rates for non-whites were 59.5 to 68.2.

These racial data demonstrate that nonwhite women have been active members of the paid labor force for a longer period of time. Although the nonwhite females' participation rates are increasing, a relatively greater proportion of white females are joining the paid labor force. In addition, a larger proportion of the female paid labor force is white. The changes in the participation rates of white females is more dramatic and accounts to a greater degree for the recent changes that have occurred in the paid labor force.

2.2 CHANGING FAMILY STRUCTURE
At the same time that more and more women are entering the paid labor force they are also assuming greater financial responsibilities. Recent years have seen a dramatic increase in the number of women who are heading households. Women are maintaining both family and nonfamily households at higher rates. The number of females who were heads of a household almost doubled from 1960 to 1980. In 1960 almost 4.2 million households were headed by females and by 1980 over 8.2 million females were heading households without a husband present in the household. In this time period, an
increasing amount of families were living in female-headed households. In 1960 9.3 per cent of all families were headed by females and by 1980 the share of families headed by females had increased to 13.9 per cent (U. S. Bureau of the Census, 1980).

More young women were heading households, assuming sole responsibility for the family at a much younger age than ever before. Those women aged 25-44 accounted for the majority of the increase for female-headed family households. Because of this large increase in the numbers of younger women heading family households, relatively fewer older women were heads of family households. Women 65 and over actually demonstrated a decrease in the per cent maintaining family households.

Older women were far more likely to head a nonfamily household. Although all age groups experienced higher rates of heading nonfamily households, older women experienced quite a dramatic increase from 19.1% in 1950 to 41.8% in 1980. In 1980, more women aged 65 and over were heads of nonfamily households than were in the other household types of married couple family and single female-headed family combined (U.S. Bureau of the Census, 1983). The United States Census Bureau's definition of a married-couple family includes those persons in traditional family settings. It does not identify those persons who live in a
homosexual-couple family. Therefore, these families would be identified as nonfamilies.

The number of female-headed nonfamily households has increased for women of all ages. More elderly women are living alone because they are either divorced or widowed. The younger women have increased (1.7% in 1950 and 6.9% in 1980 for women 25-34) heading nonfamily households because 1) they are delaying marriage, 2) they are more likely to be divorced, 3) they are establishing their own households earlier in their lives rather than living with relatives until marriage, and 4) they are in a coupled-family household which is not defined as a family by the United Census Bureau.

This greater propensity for females to head households indicates more women are assuming greater financial responsibilities.

The economic implications of these changes are immense. The notion that women are cared for by men, first by their fathers and later by their husbands, has perhaps never been a very accurate picture. But now, more than ever, the training, paid labor force participation, and earnings of women are important because of women's increased need, as well as preferences, to rely on their own resources at different stages in the life course (U.S. Bureau of the Census, 1983, p.12).

The family structure in the United States has changed dramatically in recent years. Bianchi and Spain (U.S. Bureau of the Census, 1983) point out that although the vast majority of females will marry (In 1980, 90% of all
women 30 and over had married at least once) the duration of the marriage has changed. The number of marriages ending in divorce has increased while at the same time the death rate has declined. As a result, the divorce rate becomes the most important component of change. Cherlin (1981) noted that in the 1970's more marriages ended in divorce than in death unlike any other time in history. Current estimates indicate that out of all of the marriages that took place in the 1970's almost half will end in divorce.

Following a divorce, women suffer more financially than men. Recent estimates indicate that the number of fathers who pay entire payments and on time is alarmingly low. In 1983 nearly one-fourth of all women who were supposed to receive child support payments did not receive them. Only half received the full amount of the payment (Table 5).
Table 5
Child Support for Women with children

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Supposed to Receive Payments</td>
<td>3995</td>
<td></td>
</tr>
<tr>
<td>Actually Received Payments</td>
<td>3037 (76.0%)</td>
<td></td>
</tr>
<tr>
<td>Received Full Amount</td>
<td>2018 (50.5%)</td>
<td></td>
</tr>
<tr>
<td>Received Partial Amount</td>
<td>1019 (25.5%)</td>
<td></td>
</tr>
<tr>
<td>Did not receive payments</td>
<td>958 (24.0%)</td>
<td></td>
</tr>
</tbody>
</table>

Source: U.S. Bureau of the Census
Current Population Reports, Series P-23, No.148,
Child Support and Alimony: 1983 (Supplemental
Report), U.S. Government Printing Office,

2.3 FEMINIZATION OF POVERTY

A large portion of the households living below the poverty line are headed by females. Poverty has become a state of existence for many women and their children as well. The vast majority of these are either single women with dependent children or elderly widows who have outlived their husbands. This "feminization of poverty" is reflected in the number of women heading households that are below the poverty level.

The number of all families below poverty increased 3.4% from almost 5.5 million in 1970 to almost 5.7 million in 1980.\(^2\) The increase in the number of female-headed house-

---

\(^2\) In 1970 the definition of poverty level changed from earlier censuses so that a time series examination is not plausible. Henceforth the comparisons are from 1970 to
holds, with no husband present was a dramatic 38.0% from just over 1.8 million to almost 2.5 million (See Table 6).

Table 6

Female Headed Households Below Poverty Level

<table>
<thead>
<tr>
<th></th>
<th>1960</th>
<th>1970</th>
<th>1980</th>
</tr>
</thead>
<tbody>
<tr>
<td># families below poverty level</td>
<td>8 315 419</td>
<td>5 481 149</td>
<td>5 670 215</td>
</tr>
<tr>
<td># female-headed households with no husband present below poverty level</td>
<td>1 774 212</td>
<td>1 800 038</td>
<td>2 484 246</td>
</tr>
<tr>
<td>% of families below poverty with female heads of household</td>
<td>21.3</td>
<td>32.8</td>
<td>43.8</td>
</tr>
</tbody>
</table>


As more and more women are heading households the economic status of these households has decreased. A larger proportion of impoverished families became reliant on a single mother as the head of the household. One out of every five impoverished households were headed by a female in 1960. By 1980 nearly one out of every two families below poverty level had a woman as its head of the house-

---

1980. The previous definition for 1960 excluded all persons in group quarters; included all unrelated individuals, regardless of age. For 1970 and 1980 it excluded all inmates of institutions, persons in military group quarters and in college dormitories, and unrelated individuals under 15 years in 1980 and under 14 years in 1970.
hold (see Table 6). The other half of impoverished fami-
lies were either headed by single males or were headed by a married couple. Increasingly it was more common to find impoverished families composed of single mothers caring for dependent children.

2.3.1 Impoverished Women and Their Children

The feminization of poverty has occurred as more women have assumed full responsibility for their dependent children. Over two million more female-headed families with dependent children were created in the 1970's. This represented a 59% increase from almost 3.5 million in 1970 to just over 5.5 million in 1980 (see Table 7). More families had single women as their heads of the household than ever before. Single women were now solely responsible for the economic and emotional support for the family.

A large number of these women and their families were facing poverty. It is not just the women who is impover-
ished but her children also. The number of female-headed families with dependent children that were below the poverty level also increased 48.2% from almost 1.5 million in 1970 to over 2.2 million in 1980. Nearly half of all female-headed families are below the poverty level.

The overwhelming majority of women who are heading impoverished households have dependent children less than 18 years of age. In 1970 83.3% of all female-headed impov-
Table 7
Female Headed Households with Children

<table>
<thead>
<tr>
<th></th>
<th>1970</th>
<th>1980</th>
</tr>
</thead>
<tbody>
<tr>
<td>female heads of household with no husband present with children &lt;18</td>
<td>3 468 430</td>
<td>5 509 315</td>
</tr>
<tr>
<td># female heads of household with no husband present with children &lt;18 below poverty level</td>
<td>1 499 833</td>
<td>2 222 439</td>
</tr>
<tr>
<td>% of all female heads of household below poverty level that have children &lt;18</td>
<td>83.3</td>
<td>89.5</td>
</tr>
<tr>
<td>% of all families below poverty level that are female-headed households with no husband present with children &lt;18</td>
<td>27.4</td>
<td>39.2</td>
</tr>
<tr>
<td>% of all families with children &lt;18 below poverty that are female-headed households with no husband present</td>
<td>43.0</td>
<td>52.7</td>
</tr>
</tbody>
</table>


...erished households had dependent children, and it increased to 89.5% in 1980 (See Table 7). When women are impoverished so are their children, and an overwhelming majority of poverty-stricken women have children.

This means that among all families below the poverty level a large proportion are single females with dependent...
children. Table 7 demonstrates that in 1970 27.4% of all impoverished families were families with children and a single female family head. In ten years this increased dramatically to 39.2%. Nearly two out of every five impoverished families are composed of single mothers with children. More families below the poverty level are headed by females who have dependent children.

If a child is a member of an impoverished family he or she is now most likely to be in a single, female-headed household rather than in a single, male-headed or a married-couple family household. Table 7 shows that in 1970 43.0% of all impoverished families with dependent children were headed by single females. By 1980 that proportion had increased to 52.7%.

More women are heading households with dependent children and nearly half of these women with children are below the poverty level. A vast majority of impoverished women have dependent children which creates the large number of impoverished families that are comprised of women with children. Most impoverished children today are, therefore, found in families with only their mother present.
2.3.2 Racial Patterns

These patterns of female family responsibilities and impoverishment vary by race. An increasingly large portion of these impoverished women are nonwhite. The percentage of white families that have female heads of household has increased slightly from 8.1% in 1960 to 10.8% in 1980 (See Table 8). More nonwhite families are headed by females and that proportion is increasing. From 1960 to 1980 the percentage of families headed by single females increased from 20.9% to 31.8%.

Table 8

Female Headed Households by Race

<table>
<thead>
<tr>
<th></th>
<th>1960</th>
<th>1970</th>
<th>1980</th>
</tr>
</thead>
<tbody>
<tr>
<td>% of White Families with single female householders</td>
<td>8.1</td>
<td>9.0</td>
<td>10.8</td>
</tr>
<tr>
<td>% of Nonwhite Families with single female householders</td>
<td>20.9</td>
<td>25.9</td>
<td>31.8</td>
</tr>
<tr>
<td>% of White Families below poverty level that are single female householders</td>
<td>18.3</td>
<td>27.1</td>
<td>34.4</td>
</tr>
<tr>
<td>% of Nonwhite Families below poverty level that are single female householders</td>
<td>30.5</td>
<td>47.3</td>
<td>59.8</td>
</tr>
</tbody>
</table>

Women of color are heading more households overall. Their households are more likely to be impoverished than their white female counterparts. The percent of impoverished white families that are headed by single females has increased from 18.3% in 1960 to 34.4% in 1980. The pattern for nonwhite females is alarmingly more dramatic. By 1980 nearly two-thirds of all nonwhite impoverished families, 59.8% were headed by single females. This is nearly twice the proportion of 30.5% in 1960 (See Table 8). This "feminization of poverty" is, therefore, largely a nonwhite female experience.

More black children under 18 live in families headed by women, 44%, than live in married couple family households, 42% (U.S. Bureau of the Census, 1983). Bumpass and Rindfuss (1979) estimate that one-third of all white children born in the 1970's will live in a household with their mother only. It is even more dramatic for blacks where they predict three-fourths of all black children will live at some time in a home with no father present.

Although nonwhite women have a stronger, lengthier tradition of participation in the paid labor force, their relative financial status has decreased. The nonwhite woman is more likely to be solely responsible for her children and to be impoverished.
2.4 GENDER INCOME DIFFERENTIALS

Women entered the paid labor force in dramatic amounts in recent years. They increasingly assumed greater financial responsibilities as they became heads of both family and nonfamily households. They required more financial resources and began working in the paid labor force to support their households. However, more and more of these female headed households are impoverished. The work place fails to provide them with income comparable to men who support households. Women continue to receive $.65 for every dollar a man earns.

2.4.1 Historical Patterns

Historically women always received lower incomes relative to men. This gender wage gap changed very little from 1950-1987. It has vascillated throughout this time period. In 1950 the gender wage gap was $.57 and has only converged to $.65 in 1987.

This small change occurred during the time period when the entrance of women into the paid labor force escalated. In 1950 one-third of all women were employed outside the home and earning 57% of male incomes. By 1980 the percentage of women in the paid labor force inflated to almost 50% yet they make only $.05 more on the dollar ($.62). The gender difference in participation in the paid labor force rapidly converged so that almost one out of every two
workers is a female (42.1% are female) by 1980. However, the gender wage gap changed very little.

2.4.2 Racial Variations
The overall gender wage gap has changed little in the recent past, but the pattern varies by race. White females earned $.61 on the white male dollar in 1950. By 1980 the gap actually widened to $.55. White women earned less relative to white males over the three decades.

The gender wage gap between black women and black men dramatically converged from $.59 in 1950 to $.78 in 1980. Black women were approaching black male incomes, but white females are losing ground on white males. Therefore, the small convergence of the overall gender wage gap was largely due to the convergence of the black gender wage gap. White men out-earn black men. In order to create a greater impact on the gender wage gap, all women, both black and white, need to approach white male incomes.

2.4.3 Regional Variations
The gender wage gap varies across regions of the United States. Figure 1 shows the gender wage gap by state in 1980. West Virginia and Wyoming had the widest gender wage gap. $.50. Women in those two states earn half of what men earn. Other states with wide gender wage gaps were Texas, Louisiana, and the midwestern states of Michigan, Indiana, Ohio, Missouri, and Kentucky.
GENDER WAGE GAP, 1980

Figure 1: Gender Wage Gaps, 1980
The smallest gender wage gap is in Washington, D.C. with $.78. The District was markedly above the next smallest gender wage gaps of $.68 and $.65 in Hawaii and Alaska, respectively. The east coast and west coast prove the best states overall with the lowest gender wage gaps. However, the range of the gender wage gaps is quite narrow, indicating small variances in gender wage gaps across state boundaries.

The changing gender composition of the paid labor force has created new foci for research associated with it. These changes have accompanied changes in the structure of the family and the increasing feminization of poverty. While more women are entering the paid labor force and assuming greater financial responsibilities as heads of households and families, they are not receiving similar economic rewards in the paid labor force. Gender wage gaps persist. The new patterns of a feminized paid labor force, changing structures of the family, the feminization of poverty, and gender wage gaps are the focal points for a growing body of literature. This study focuses on gender wage gaps and builds on previous research conducted on it.
CHAPTER III

THEORETICAL ISSUES AND RELATED RESEARCH

The feminization of the paid labor force has brought about many significant changes in the United States. More women are employed for pay and the changing structure of the family requires women to assume greater financial responsibilities. Just as men have traditionally been the heads of households and families, women are now assuming those roles too. Although women are serving the same roles as men, they are not receiving the same pay as men. More women are driven below the poverty line creating a feminization of poverty. Ironically, at the same time the feminization of the paid labor force has occurred, a feminization of poverty has also evolved. Because of these changes, the examination of gender wage gaps has become the focus of numerous studies.

A large body of literature has addressed the issue of accounting for the wage disparity. These researchers have examined the many variations affecting gender wage gaps from many differing theoretical perspectives. Research designs and the data sets employed are numerous and varied.
A discussion of these perspectives is presented here and is followed by a presentation of the theoretical framework and expectations of this research.

3.1 LABOR MARKET SEGMENTATION

One approach towards understanding the causes of gender wage gaps is espoused by labor market segmentationists (Bergmann, 1986; Doeringer and Piore, 1971; Gordon, 1972; Piore, 1975, 1977). They explain that men occupy the occupations in the core or primary sector, and women cluster in peripheral secondary sector jobs. These female-dominated jobs receive lower income because of their lesser status.

Also accounting for the gender differential in income is the fact that more women are concentrated in lower paying jobs (Treiman and Terrell, 1975). However, even within the same occupational categories income differentials are present (Rytina, 1982b; U.S. Bureau of the Census, 1983). The reorganization of the work-structure has affected women because of the decrease in intermediate skilled jobs and the increase in the number of low skilled jobs. Women are slotted in these low skilled occupations (Franklin, 1984).

The largest gap is in sales where women make 49% of male salespersons. This differential is largely due to the type of sales jobs in which women are concentrated as compared to men. Women work in the lower paying, lower status,
retail sales occupations. Men, on the other hand, sell automobiles and other big-ticket items on a commission basis or are employed in corporate sales where the larger paychecks are distributed (U.S. Bureau of the Census, 1983).

The lowest gender gaps in wages for these broad occupational categories exists for laborers. This is a relatively new occupation for women, though, and therefore, a small percentage of all laborers are female (U.S. Bureau of the Census, 1983).

Research investigating wage differentials for detailed occupational categories also demonstrates similar gender disparities in income (Rytina, 1982b). Therefore, the wage gap can partially be explained by the fact that women are concentrated in lower paying occupations.

Doeringer and Piore (1971) define a complex model of segmentation. Blau and Jusenius (1976) apply it to occupational sex segregation. Segregation occurs because of the mobility ladders within internal labor markets. Occupational stability and tenure are a high priority in the mobility ladder. If women are perceived (via statistical or error discrimination) as less stable, possessing high turnover rates, and more likely to leave the job, then occupational sex segregation results.
The firm assigns wage rates to occupations so it initially appears to be free from gender bias. However, what occurs is men and women are assigned different job categories. Female jobs are defined based on the characteristics of the average women worker. The result is equal pay for equal work within each occupational category, but the comparable worth issue surfaces. Jobs of comparable worth are not equally rewarded.

Bergmann (1986) suggests that men and women compete in two separate markets. This division of the labor market creates inefficiency. Reduced productivity is the result of women overcrowding into certain jobs and artificially expensive male market labor.

Blau (1977) found that some firms hire women outside of traditionally female occupations. However, if they do so, at the same time they do not hire men in those jobs. In comparison to other firms who do hire men in those jobs the wages are lower. On the other hand, men who take traditionally female occupations are viewed as only temporarily slotted in that occupation. The employer has intentions of promotions to higher jobs for these male workers.

Proponents of the concept of equal pay for equal work claim that jobs that are disproportionately held by women do not receive wages comparable to jobs chiefly held by men. They claim that although these jobs are not similar
in content, they require comparable skills which should be rewarded similarly. Treiman, Hartmann and Roos (1981) investigate whether the returns to job worth characteristics vary according to whether the occupation is female or male dominated. This translates into the fact that women do not realize the same rewards as men for their investments in education, experience and dedication.

3.2 HUMAN CAPITAL APPROACHES

The human capital approach suggests that workers make certain investments in themselves with the intention of receiving higher income levels (Blau and Jusenius, 1976; Treiman and Terrell, 1975; Mincer, 1974; Mincer and Polachek, 1974; and Becker, 1964). Workers invest in education and training in order to obtain credentials which will enable them to obtain higher paying jobs. The characteristics of the worker create a certain human capital.

3.2.1 Gender Differentials in Educational Attainment

However, the financial rewards for these investments vary by gender. A gender wage differential is present even for persons with the same educational attainment levels (Carnegie Commission, 1973; Featherman and Hauser, 1976). Female college graduates 25 years and older earned 62% of that earned by a male with a college degree (U.S. Bureau of the Census, 1983).
These gender differences in educational attainment lower the wages of women with respect to men. In addition, women interrupt their careers to bear and raise children. This reduces their job-specific experience and their income. Women are also more likely to work part time thereby reducing their income. Part time workers are paid less per hour than full time workers and they receive less in terms of other benefits. Due to the differences in educational attainment levels, work experience and full time work status women earn less money than men. Women make different investments in themselves and receive different outcomes.

3.2.2 The Work Experience Factor

Women have less work experience (Fuchs, 1974; Mincer and Polachek, 1978). In order to fulfill childrearing responsibilities women tend to enter and leave the paid labor force more often than men. This break from the paid work force decreases their earning potential. Women, therefore, lack the work experience that their male counterparts acquire while the women are home attending to maternal duties. Men do not take time off from their careers for childrearing and therefore realize a higher earning potential. Analysis has demonstrated that 4% of the wage gap is attributed to this lower occupational tenure of women (Rytina, 1982a).
Anker and Hain (1986) suggest that employers are reluctant to hire women in jobs where on-the-job training and continued work experience leads to higher productivity. Parents are also less supportive of educational investments in female children if they foresee early withdrawal from the work force. This is certainly more likely for daughters than for sons.

In the Lesser Developed Countries (LDC's) educational investments are certainly more important than in the More Developed Countries (MDC's). The gender gap in educational levels is much wider in these developing countries. Educational attainment differentials explain more of the occupational sex segregation and gender wage gaps in LDC's than in MDC's.

3.2.3 Critiques of Human Capital Theory

Bergmann (1986) critiques human capital theory by suggesting it omits some important considerations. There is a demand for a certain job, and the supply of workers is composed of those persons who are trained and qualified for the job. Bergmann suggests that in reality the gender of the worker (just as the age and race) influences whether the employer considers the candidate as in the available labor pool. Sometimes employers are searching for male candidates and do not consider applications from females. These jobs are usually higher paying occupations.
The depreciation of human capital is possible through nonuse of skills. Polachek (1979) suggests that gender variations in human capital depreciation is a supply-side explanation for occupational sex segregation. The occupational tenure of a women is interrupted for domestic responsibilities. Therefore, their earning potential is diminished as they leave and reenter the paid labor force to bear children. Men do not share this characteristic. Women select these lower paying jobs because of the flexibility of reentry. Polachek suggests that if they foresee intermittent employment, rational women should select occupations where job skills will depreciate less rapidly.

Paula England (1984) states that Polachek falsely assumes that women will stay home for childrearing. More women today are returning to their jobs weeks after delivery, so there is no human capital depreciation as women remain in the paid labor force.

3.3 DISCRIMINATION TYPES

Researchers suggest that discrimination of varying sorts affects the gender distribution of workers in occupations. Paula England (1984) outlines three types of discrimination: "tastes", statistical, and error discrimination. A racial study on discrimination (Becker, 1957) argued that prejudices exist which result in variations from the regu-
lar actions of "economic man". Even though it might be cheaper for an employer to hire blacks, he/she doesn't, and both the employer and the worker lose money. Employers pay higher wages for workers more suited to their tastes, and the "unsuitable" worker must seek employment elsewhere for lower wages.

Arrow (1972) suggests this would erode over time because the nondiscriminatory employer benefits from paying lower wages. This employer's share of the product markets increases and more profits are realized. Therefore, Becker's theory does not explain the persistence of occupational sex segregation.

Still other economists (eg. Blau and Jusenius, 1976) suggest that the reasons employers hire from certain groups are 1)they have more characteristics which result in higher productivity, 2)premarket discrimination, and 3)premarket socialization.

A second type of discrimination is statistical discrimination. Thurow (1975) identified statistical discrimination as when an individual is assigned a set of characteristics based on the group to which he/she belongs. A woman applying for a job is viewed as the "average woman." Means and facts based on the patterns of women are assigned to this woman. She is not evaluated as an individual. She may be better than most other men in certain aspects which
are applicable to the job, but she is not hired because women usually aren't qualified for the job. Women who develop a skill atypical of women suffer because of this statistical discrimination.

Error discrimination is the third type that England explains. She suggests that it is different from "tastes" discrimination in its economic motivation. It differs from statistical discrimination because it is not based on facts. One such myth is that women's turnover rates are higher than men's. Barnes and Jones (1974) found that women tend to interrupt their careers more often than men in order to fulfill childrearing responsibilities. However, men are more likely to change jobs across firms more often.

3.4 SEX ROLE SOCIALIZATION

Young girls and boys are treated differently. The socialization process that girls and women experience is quite different from the male experience. This variation in sex role socialization is addressed in the literature from many different psycho-sociological perspectives. A few of these will be outlined here.

Marini and Brinton (1984) give a review of the literature on the socialization process and practices that produce these sex differences prior to labor market entry.
This discussion follows their review of this literature. The literature on sex role socialization identifies four major theories. First, social learning theories involving operant conditioning and observational learning. Young girls, vis-a-vis boys, receive different positive or negative reinforcement for appropriate behavior. This sex typing occurs continuously so that sex role learning results.

A second theory addresses cognitive development in sex role socialization. Piaget argues that the child's concepts about masculine and feminine behavior are at the core of sex typing.

Information processing theories indicate that the constructs of the processing of information are the basis of sex role socialization. The emphasis is on the cultural influence on gender and not the physical sex differences.

Finally, Freudian psychoanalytic theory addresses identification theories as essential to understanding sex role socialization. Present theories move beyond the sexual basis of castration fears and penis envy. The new direction is identification with the same-sex parent as an important construct in the development of gender identities. Other role models also enter here, not just parents.

Sex role differentiation occurs as children acquire behavior appropriate for their sex. Males seek occupation-
al orientation because they are the financial providers and women pursue home management. When women do work, they don't view it as a career.

Biological components of sex typing have little effect on occupational choice. Genetic, biochemical and anatomical differences alone have little effect on gender differences in behavior. It is too simplistic to consider it as the sole reason; more significant is its relative role with respect to socialization on sex role socialization.

Essentially, what results with sex role socialization is differences in occupational orientation prior to paid labor force entry. Women have a smaller range of occupational choices. People choose typically same-sex jobs: Women, female-dominated and men, male-dominated. Women are less diversified and highly concentrated in a few occupations. The aspirations of men are more sex-typed than women; women are more likely to make a cross-sex occupational choice.

With regards to aspirations and expectations women realize their constraints and tend to expect to enter female-dominated occupations, even though they may aspire differently. By comparison women perceived male-dominated jobs as less accessible, while men perceived female-dominated jobs as more accessible. Hence, sex composition influences the degree to which women, but not men expect to realize their occupational aspirations. A few other patterns are
visible. 1) The differences between aspirations and attainments are greater for women than for men. 2) The sex differentiation of occupational aspirations appears at an early age. 3) Men are more aware of the status and income returns to specific occupations. 4) Occupational values vary. Women value occupations that involve helping people while men consider status and wages more important. 5) Abilities and dispositional traits vary to a lesser degree.

Some evidence supports that men have better spatial and quantitative abilities while women have better verbal skills. Women are not as aggressive as men. Physically, men possess greater strength, speed, and coordination while women have better endurance, dexterity, and heat tolerance.

Finally, Marini and Brinton (1984) identify those who influence the children, and later adults, in this sex typing. First, men in the family are encouraged to participate in physical activity and discouraged in gender-inappropriate behavior.

When the child enters school many different pressures on gender-appropriate behavior are at work. The child is influenced by the gender of role models, gender bias in texts, career counseling, curriculum tracking and vo-ed., and the degree and stress on training in math and sciences. Legislation (eg., Title IX) affects the gender orientation
and, of course, the mass media and its portrayal of women is not to be forgotten.

The effects of socialization on occupational sex segregation is viewed at two levels. At the micro-level it is important to examine how the individual reacts to socialization. Several issues are at the core of occupational sex segregation when discussed at the macro-level: 1) supply and demand for specific workers, 2) the structure of the work organization, 3) cultural beliefs and practices, 4) legal arrangements, and 5) actions of the employers.

3.5 OCCUPATIONAL LABOR MARKETS AND WORKPLACE SEGREGATION

Parcel and Mueller (1983) found that the local industrial and occupational labor market characteristics affect gender differences in earnings. The economic structure of the area affects earnings so that the type of industrial employment in the area has a strong relationship with wages. White collar occupations rank higher on a prestige scale and are rewarded with higher incomes. The greater the prestige, the higher the wages.

Supply and demand influences wage levels (Waldaur, 1984; Stolzenberg, 1975). Waldaur develops the idea that the presence of diverse labor market opportunities will raise incomes. Job opportunities are greater in urban areas so that the worker has a greater chance to find other jobs in
his or her occupation. The worker has increased bargaining power with the employer to lobby for higher wages because of the other opportunities available in his or her occupation.

In addition, the size of the available labor pool affects wages. If unemployment is high, this lessens the worker's bargaining power and, thus, lowers his or her wages. When a large, skilled, paid labor force pool is available, greater job competition exists and wages remain low. Since the worker can easily be replaced, he or she loses his or her bargaining power. The demand for the skills required for the occupation is not sufficient to command higher earnings.

Stolzenberg also identifies that differences in pay vary according to social factors. The racial and sex composition of an occupation influence the occupational outcomes. His arguments are reinforced by research in both sociology and economics literature. The "crowding" hypothesis espoused by Bergmann (1971) suggests that ethnic minorities tend to concentrate in an occupation initially because discrimination forces them out of some occupations and into others. This "crowding" of an ethnic minority in some occupations creates greater competition in that occupation driving wages levels down. Sociologists Hodge and Hodge (1965) and Taueber, Taueber and Cain (1966) also develop
similar arguments. Additionally, Snyder and Hudis (1976) find that greater competition from women negatively affects male incomes and that the segregation of ethnic minorities into lower paying occupations demonstrates a negative relationship with white male incomes.

Finally, the family structure in the United States has dramatically changed in recent times. The recent phenomena of dual career families and the feminization of poverty reflect the changing impact of family structure on socioeconomic inequalities. Employers view married males as more reliable, stable workers than single males. Married men are viewed as more settled because they have a wife and possibly children to support. Married females, on the other hand, are expected to drop out of the paid labor force while they attend to childrearing duties. They are not seen as being career-minded and, therefore, receive fewer opportunities for advancement to higher paying jobs. The employer is also concerned that his or her investment in the worker in terms of training and experience is lost when the female worker interrupts her career (Parcel, Cuvelier, Zorn, and Mueller, 1986).

Certainly these stereotypes do not exist to the extent that they once did. Recently more dual career families do not sacrifice the female's job when beginning a family. A larger percentage of women with small children are now
working full time and not sacrificing continuous work experience for full time childrearing.

Additionally, family size affects earnings. Employers believe workers with no children can devote more time to careers and have more flexible schedules to accommodate varying responsibilities such as travel and overtime work. Childless workers also enjoy greater mobility within occupations. Uprooting a larger family is more difficult, costly, and risky. The remaining unexplained differential is generally attributed to unmeasured factors such as discrimination and the exploitation of cheaper female labor (Oaxaca, 1973: Suter and Miller, 1973: Corcoran and Duncan, 1979).

3.6 ALTERNATIVE APPROACHES

Feminists argue that the patriarchal society in which we live creates occupational sex segregation. Patriarchy is the attempt by men to maintain domination of women. This male dominance perpetuates the subordination of women into lower status occupations.

Few feminists have actually applied patriarchy specifically to occupational sex segregation (Paula England, 1984). Women are assigned the domestic work and their employment is viewed as a secondary role. Men benefit more than women by this subordination of women. They have eco-
nomic reasons for perpetuating patriarchy since their wages remain higher than women's (Chodorow, 1978; Mitchell, 1976).

Marxist theories suggest that occupational sex segregation exists because of the desire of capitalists to "divide and conquer." With the gender segregation in occupations little solidarity among workers exists. The threat of rebellion of united workers is lessened (see Edwards, Reich, and Gordon, 1975; Stevenson, 1978).

Paula England (1984) discusses why employers don't hire cheap female labor in all occupations:

...if a firm hired women for all jobs, workers would be more apt to develop a common class consciousness and to act in concert to better their positions relative to management and the owners of capital. (England, P., p. 39. 1984)

3.7 DISCRIMINATION AND GENDER WAGE GAPS

One methodological approach examines the discrimination within the labor market. Its focus is measuring the portion of the gender wage gap attributed to labor market discrimination by removing certain factors associated with wage discrimination. These control variables include educational attainment, age, race, job-training, experience, seniority in the firm, union status, health, marital status, hours of work, city size, size of firm, region, absenteeism, quality of education, and number of children (Trei-
man and Hartmann, 1981, p.21). The difference in pay between men and women attributed to labor market discrimination is measured through productivity related characteristics.

Some of these characteristics as well as the characteristics of the job reflect labor market discrimination. In addition, they may reflect pressures from outside the labor market or certain responses by women to the wage discrimination and occupational sex segregation. Reuben Gronau (1988) suggests some of these variables are affected by wages and wages, in turn, are affected by the variables.

The person's work intensity affects the wages he/she receives and the wages received impact on the level of work intensity. A person who has a high intensity receives higher wages and higher wages means a greater incentive for hard work. A woman who receives lower wages is less likely to work hard and, therefore, receives lower wages. Women may have higher turnover rates and absenteeism because of their low waged, dead end jobs. In turn, women don't enroll in some education programs because they think the opportunities are closed for them.

These variables are, therefore, inherently discriminatory. Gunderson (1989) suggests they not be factored out in studies examining discrimination.
Many of the problems with gender wage gap studies are associated with the data sets. All of the control variables associated with gender wage gaps are difficult to find in a single data set. The occupational categories are often too broad and some don't differentiate between part and full time jobs. The data sets which contain many of the control variables are small data sets, specific to a certain city or geographic area.

The empirical evidence is wide and varied depending on the variables in the data sets, source of the data, and the empirical procedures and techniques used.

One method to estimate gender wage gaps and deal with these problems outlined above is to compare specific occupations or at least narrowly defined occupational categories. These narrowly defined occupations are good substitutes for human capital and other job requirements. Examining specific occupations in the same firm is even better.

Another method commonly used is wage decomposition. Wage decomposition is broken into two components: the portion attributed to the differences in endowments of the wage generating characteristics and the portion attributed to differences in returns (Corcoran and Duncan, 1979; Sandell and Shapiro, 1978; Mincer and Polachek, 1978 and 1974; Blinder, 1973; Malkiel and Malkiel, 1973; and Oaxaca.

3.8 THEORETICAL FRAMEWORK
Previous studies of the patterns of gender wage gaps set the groundwork for the presuppositions and expectations of this research. Embodied in this research design are certain expectations of the relationships associated with gender wage gaps. The distinctive patterns in gender wage gaps identified in previous research is also investigated in this study. Additionally, this particular research examines the spatial variations in gender wage gaps and the effects differing environments have on gender wage gaps and their determinants.

This study focuses on contextual variations in the relationships associated with gender wage gaps. A desirable feature of the research is that it does not remove the relationships from their context. Whether and how the environment impacts on the relationships between gender wage gaps and their determinants addressed in this research. The study focuses on the environmental impact on how a person's individual characteristics affects his/her income and whether this impact exhibits gender variations.

3 For a discussion of the work decomposition technique see Gunderson, 1989.
For instance, the size of a metropolitan area has an impact on the how a person’s educational credentials impact on his/her income. The environment of the large metropolitan area creates different circumstances and the relationships associated with gender wage gaps are affected by this context. A smaller metropolitan area provides a different context and, therefore, varying outcomes. The income levels of an individual are increased by advances in educational attainment, but is this relationship spatially variant? Is the relationship affected by changes in environmental conditions and is the environmental impact different for men than for women?

3.8.1 Populations Size Hypotheses

This study examines nine separate environmental conditions with respect to the contextual impact on the relationships associated with gender wage gaps. Discovery of specific patterns of these environmental impacts or the effects of the independent variables on the dependent variable are expected. Previous research leads to several expectations in this work.

First, the study examines the population size of the metropolitan area and its impacts. Larger metropolitan areas have greater overall opportunities than smaller metropolitan areas. They present a greater variety of occupations across different industries. More white collar jobs
are found in larger metropolitan areas because of the presence of more offices for both businesses in the private sector and public sector government jobs. Larger metropolitan areas house state governments, federal government operations, large law firms, financial institutions, retail businesses' main offices, and central offices for insurance agencies where many white collar occupations are offered.

Jobs in the service industries are created to serve these businesses in large metropolitan areas. In the private sector these include occupations in restaurants, hotels and places of entertainment. The public sector provides occupations with airports, mass transit authorities, welfare departments, and other social service agencies.

The greater variety of occupations available to workers in larger metropolitan areas affects their wage rate. Because of the greater number of white collar jobs available in larger metropolitan areas the size of a metropolitan area is expected to impact on the effect a white collar occupation has on income. Gender variations in this impact are anticipated because women are employed in low paying white collar jobs while men work in high-paying managerial positions. Women are in the clerical positions receiving lower wages while men are their supervisors. Many more opportunities for higher paying white collar jobs are available in larger metropolitan areas, but men are the ones securing those positions.
Smaller metropolitan areas have more traditional lifestyles where the male is the chief breadwinner and the female works inside the home, or if she works in the paid labor force, it is the secondary career in the family. The larger metropolitan areas have more varying lifestyles with more dual career families, single people, childless couples, and younger working age people. Young couples seek large cities where there are greater opportunities for both partners. Single people beginning their careers are attracted to the large metropolitan areas for jobs and the lifestyle.

The size of the metropolitan area is expected to impact on the effect a person's age, marital status, and other sources of income have on his/her income. Because of these more traditional lifestyles in smaller metropolitan areas, marital status should affect income differently for men than for women. A married woman in a smaller metropolitan area is more likely to have a career which is secondary to her husband's career, whereas in larger metropolitan areas she pursues career-advancing jobs which are higher paying. Married women in smaller metropolitan areas are more likely to drop out of the paid work force to administer to domestic, childbearing, and childrearing tasks. When they reenter the paid work force they have lost the income incremental benefits of continuous experience in a specific job.
Younger women in large metropolitan areas have more day care facilities available to them and are more likely to stay in their jobs and pursue higher paying advancements than if they were in a smaller metropolitan area.

The term for age in this study is AGE which primarily reflects the tendency towards higher income as a person ages. An increase in AGE crudely reflects the effect of experience, maturity, and training on income. The AGE² term reflects the tendency for older people to experience an age-wage penalty. The loss of earning potential in the higher age groups is reflected in AGE². The effects of AGE on income reflect an age-wage increment effect and the effects of AGE² represent the age-wage penalty effect.

The age-wage increment effect is expected to be higher in larger metropolitan areas. The larger metropolitan areas provide greater opportunities for advancement and rewards for the workers' experience, longevity, and training. Men and women can take advantage of the greater career opportunities in larger metropolitan areas where the higher paying jobs are located.

The age-wage penalty effect is anticipated to be stronger for women in smaller metropolitan areas because an older woman reentering the paid labor force, as a woman with grown children, as a displaced homemaker, as a divorcee, or as a widow, finds greater opportunities in larger metropol-
itan areas. She has more avenues of support through the public services available. For instance, a woman without a car in a large metropolitan area can work at a job far away from her home because she can use public transportation. A woman in a smaller metropolitan area is more restricted spatially in terms of the jobs available to her. That woman in the large metropolitan area also has more training opportunities available to her than her female counterpart in a smaller metropolitan area.

The size of the metropolitan area is expected to impact on the effect of ethnicity on income. Due to the greater ethnic diversity in larger metropolitan areas and the more liberal viewpoints in the large metropolitan areas ethnicity should affect income differently than in ethnically homogeneous and traditional smaller metropolitan areas. A nonwhite person has more job opportunities in larger metropolitan areas and, therefore, can seek higher paying jobs than if he/she were in a smaller metropolitan area.

The person's educational credentials are expected to affect income differently in large metropolitan areas, vis-a-vis smaller metropolitan areas. In large metropolitan areas educational payoffs are greater because of the higher paying jobs found there. Large corporations and their high-paying jobs requiring higher educational attainment levels are located in large metropolitan areas. The small-
er metropolitan areas don't have as many high-paying jobs as those found in the larger metropolitan areas. The large metropolitan areas house large legal firms, hospitals employing highly specialized health care professionals, and other employers requiring advanced educational credentials. A doctor in a small metropolitan area is a general practitioner whereas if he/she were in a large metropolitan area he/she would be a cardiologist performing heart transplants for much greater pay.

Educational degrees reap greater benefits in large cities for both men and women. However, since men are concentrated in the careers with high financial rewards the positive effects of educational attainment on income is expected to be greater for men. Women obtain nursing degrees, teaching certificates and degrees in social work whereas more men are lawyers and doctors.

3.8.2 Educational Attainment Hypotheses

In addition to the anticipated impact that the size of the metropolitan area has on the effects associated with income, the overall educational attainment level of the population in the metropolitan area is also expected to impact on the effects. An metropolitan area with a highly educated population creates certain conditions which impact on the effects associated with a person's income. A lower-educated population has more traditional lifestyles where
women are less likely to work in the paid labor force and men are the career goal-oriented workers. Higher paying jobs requiring greater educational credentials are in the more educated metropolitan areas.

In metropolitan areas with a more highly educated population the age-wage penalty effect is anticipated to be greater, especially for women. Part of the age-wage penalty effect for women is due to reentry into the paid labor force after interruptions in their career. As a woman reenters the paid labor force in a metropolitan area with more highly educated people, the greater her competition is and she is less likely to obtain a higher paying job than if she were in a metropolitan area with less competition from higher educated people. The requirements for advanced educational degrees are not as great in metropolitan areas with populations with lower educational attainment levels.

The age-wage increment is anticipated to be greater in metropolitan areas with a more highly educated population. Higher paying jobs requiring higher educational attainment levels are found in the metropolitan areas with more highly educated populations. Workers move through the ranks and up the corporate ladder to obtain these higher paying jobs. The age-wage increment effect is anticipated to reflect these payoffs in the higher educated metropolitan area. This effect is expected to be stronger for men since they
are the ones who secure the high-paying managerial positions. As women age in these metropolitan areas, they are not rising to high-paying corporate jobs.

Marital status and sources of other household income have greater effects in metropolitan areas with people of lower educational attainment levels. Metropolitan areas with lower educational attainment levels have more traditional lifestyles. A married woman in a metropolitan area of lower educational attainment levels is more likely to be in a traditional lifestyle as a homemaker or in a secondary career. Her husband provides the primary source of income. Married women in metropolitan areas with higher educational attainment levels for the population as a whole are more likely to have higher paying occupations than their female counterparts in metropolitan areas with lower educated populations.

The educational level of the metropolitan area is anticipated to impact on the effect of ethnicity on income. Nonwhites have lower educational attainment levels, therefore, if they are in a metropolitan area where more people have high educational credentials they are more likely to receive smaller incomes. If they are in a metropolitan area with less competition from more highly educated people they will receive better incomes.
The effect that a person's education and occupation has on his/her income is expected to be affected by the educational attainment level of the population in the metropolitan area. A more highly educated person or one in a white collar job will find greater opportunities for high-paying jobs in metropolitan areas with a more highly educated population.

3.8.3 White Collar Hypotheses

The percentage of white collar jobs in a metropolitan area is anticipated to impact on the effect of the individual's characteristics on his/her income. In white collar, high technology metropolitan areas the age-wage increment effect is greater because of the opportunities for advancement in white collar employment. Blue collar employment provides little opportunity for advancement to the higher paying managerial positions. This effect is true for men, but women don't receive the same opportunities for advancement in white collar jobs. They are the secretaries, bank tellers, and insurance claim officers. Men move through the ranks and up the corporate ladder faster than women. Therefore, a high technology metropolitan area with more white collar occupations is expected to increase the age-wage increment effect for men more than for women.

The age-wage penalty effect for women would be less in metropolitan areas with more white collar jobs because of
the greater opportunities to obtain jobs in offices. The white collar metropolitan area is likely to have more services available to serve the high powered executives providing more occupations in hotels and restaurants. In a blue collar metropolitan area these opportunities are not as widely available. For men, the age-wage penalty effect would be less in metropolitan areas with high white collar employment because they reap the benefits of their experience.

People in blue collar metropolitan areas lead more traditional lifestyles indicating that the effect marital status and other household income have on income varies contextually. A woman's marital status affects her income differently in a blue collar metropolitan area than in a white collar metropolitan area. A married women in a blue collar metropolitan area is more likely to work in a secondary career or not work in the paid labor force. She works at the corner drugstore after the children have entered school whereas a woman in a white collar metropolitan area uses a daycare center and relies less on her husband as the only or major income source.

Blue collar metropolitan areas impact on the effect ethnicity has on income. Nonwhites have greater opportunities for employment in blue collar metropolitan areas. Due to the lower educational attainment levels of nonwhites they
are less qualified for white collar employment. Gender variations are anticipated because of the greater job opportunities for women in service industries in white collar metropolitan areas.

The effect educational credentials and white collar employment has on income is anticipated to vary according to the percentage of white collar occupations in a metropolitan area. White collar metropolitan areas have higher income jobs available for the educated person and the person seeking white collar employment. A person in a white collar occupation receives higher pay if there are more chances of finding a high-paying white collar job.

3.8.4 Racial Hypotheses

The percentage of nonwhites in the metropolitan area impacts on the effect of the individual characteristics on income. The more ethnically diverse a metropolitan area the weaker the age-wage increment effect on income. Because nonwhites traditionally do not reap the same benefits for their experience the expectation is for metropolitan areas with proportionately larger numbers of whites to have a greater age-wage increment effect. Nonwhites' educational credentials are not as high and, therefore, they don't have the job which pays off in high incomes for their experience.
Likewise with the age-wage penalty effect. The age-wage penalty effect would be greater in nonwhite metropolitan areas because nonwhite women reentering the paid labor force and nonwhite men who have been in the paid labor force for a long time have greater competition for jobs.

The proportion of nonwhites in the metropolitan area also would impact on the effect marital status and other household income have on individual income. Nonwhites are less likely to be in a traditional family setting. Many nonwhite women are impoverished heads of households. They were pregnant at a young age and lack the educational credentials. They are single mothers who are financially responsible for their children with little or no assistance from the fathers of their children who cannot afford to provide child support on their low wages. Nonwhite areas are expected to have a distinct impact on the effects marital status and other household income have on income.

Nonwhite metropolitan areas also will impact on the effect educational attainment has on income. Because of the lower educational attainment levels of nonwhites, education is expected to increase income levels to a greater extent in white metropolitan areas. In addition, whites are more likely to be employed in white collar jobs. so an area with more whites is expected to have white collar employment positively impacting on income to a greater extent than in a nonwhite metropolitan area.
3.8.5 Per Capita Income Hypotheses

The overall wealth of the people in the metropolitan area measured as per capita income is also expected to impact on the effect the individual's characteristics has on his/her income. In metropolitan areas of greater wealth the age-wage increment effect is likely to be higher. Wealthy areas are more likely to have older people who earn more money because they are the ones on the top rungs of the corporate ladder. The people are receiving the rewards of their experience. The age-wage penalty effect is expected to be high especially for women. In rich metropolitan areas the women are more likely to be displaced homemakers with little skills to obtain high paying jobs.

Poorer metropolitan areas would have larger numbers of single female householders who have sole responsibility for their children. The effect of marital status and sources of other income are expected to be affected by the overall wealth of the area.

In addition, poorer areas are expected to impact on the effect ethnicity has on income. Since whites earn more than nonwhites the effect that their race has on increasing their income is greater in wealthy areas. Wealthy areas are more likely to be white and so the white person has the advantage over the nonwhite person in terms of income.
Wealthy areas also have higher educational attainment levels and higher percentages of white collar jobs. So educational credentials and white collar occupations result in higher income levels than if the person were in a poorer metropolitan area where there are more blue collar jobs and educational attainment levels are lower.

3.8.6 Fertility Hypotheses

The number of children per female in the metropolitan area impact on many of the effects on income. The greater the fertility rate for an area, the greater the traditional family lifestyles. The effect of the age of the person on his/her income would drift according to the fertility rate in the area. The metropolitan area with low fertility rates is one where the workers have not yet started to have families.

Areas with low fertility rates also might indicate less of a traditional family lifestyle. More single people and more married couples choosing not to have children are found in these areas.

The women in these areas with high fertility rates tend to be less mobile and flexible because of their childrearing responsibilities. They are less likely to climb career ladders since they are the secondary moneymakers. The overall population is less educated and concentrated in blue collar and manufacturing jobs.
3.8.7 Single Female Hypotheses

The percentage of single female parented households in an area reflects the degree of nontraditional family lifestyles in the metropolitan area. Metropolitan areas with a higher percentage of their population composed of single female householders are metropolitan areas with more non-traditional families. These women are usually not in high-paying, top-of-the-corporate-ladder jobs because they do not have high educational attainment levels and are not flexible, mobile employees. The freedom to accept jobs that require overtime work, extensive travel and relocation to another city has not been theirs. As the sole responsibility for their children they have foregone career enhancing moves.

Many single female householders are displaced homemakers who lack occupational experience and education. They relied on their husbands' job as the primary source of income and, therefore, did not obtain educational credentials or failed to pursue career-enhancing opportunities because theirs was the secondary occupation in the home.

Younger single mothers lack the educational credentials because they are high school dropouts or did not complete their college education. They lack the credentials for higher paying employment and the time. Job selectivity is important to them. The job needs to coordinate with day-
care facility hours, to be accessible to transportation facilities or to be located close to home. These women must consider many criteria in the selection of a job. Its career-enhancing qualities are lower on their priority list.

3.8.8 Manufacturing Hypotheses

Metropolitan areas with more manufacturing jobs are more traditional family environments. The workers are blue collar and are usually men. Fewer women work in the manufacturing sector. They concentrate in service industries. The workers in these manufacturing jobs are likely to have wives who either aren’t paid members of the labor force or work in a low-paying job as a waitress at the local bar, clerk at the drugstore, or teller at the bank. The woman’s job is secondary to the man’s work.

Traditional family organizations are more predominant. Married-couple families with children are more prevalent than single people and childless couples.

Educational attainment levels are lower because those credentials aren’t required for blue collar employment opportunities.
3.8.9 Feminized Paid Labor Force Hypotheses

Metropolitan areas with a paid labor force which has proportionately more women are more likely to be progressive with higher educational attainment levels, more white collar occupations, and fewer traditional family lifestyles. The age-wage increment effect is likely to impact men’s wages to a greater degree since women have less longevity and job specific work experience.

With more women in the paid labor force women are working both because they must and because they choose to work. They have greater financial responsibilities as sole providers of their families. In dual career families theirs is the secondary career that sacrifices for the advancement and opportunities of their husband’s career. In metropolitan areas with more women in the paid labor force these traditional family patterns are found more infrequently.

3.8.10 Conclusions

Different approaches of examining gender wage gaps have investigated many variations affecting gender wage gaps. These works approached gender wage gaps with varying methodological approaches and theoretical perspectives. This research uses these studies as the basis for the hypotheses of this research.

This research investigates the spatial impacts of the relationships associated with gender wage gaps. The study
seeks to investigate the relationships associated with gender wage gaps and the effects of the environment on these relationships. The environment of a larger, more progressive and diverse metropolitan area provides varying opportunities for men and women. The income advantages for all workers are greater in larger metropolitan areas, however, these advantages are assumed to be greater for women because of progressive attitudes, lifestyles, and employment practices. In more traditional metropolitan areas women are more likely to receive lower incomes due to the traditional family lifestyles, the fewer opportunities, and the less progressive attitudes.
CHAPTER IV

METHODOLOGICAL FRAMEWORK

These expected relationships and varying impacts on the effects of the relationships are examined within this research. Other studies have addressed the relationships associated with gender wage gaps. These studies have identified the difference in pay between men and women, examined the underlying effects associated with it, and discussed the relationships among these effects. The research has pointed towards discussions on the impact of a number of variables on wages.

This study also examines the relationships associated with gender wage gaps. However, the methodological approach employed in this research design addresses the issue of context in a unique manner. This approach examines the contextual variations in the relationships associated with gender wage gaps and investigates the effects that the environment has on the relationships involved. The assumption in this methodological framework is that these relationships are contextually variant. The relationships between gender wage gaps and their determinants
drift across space, time, and other dimensions. This research focusses on the spatial drifts in the relationships.

The concept of a sense of place is the underlying factor which guides the relationships between gender wage gaps and their determinants. It is not merely another relationship to add to the model, but a pervasive influence on the workings of the relationships. The idea of place is the driving force that controls the impacts of the relationships on gender wage gaps.

Geographical studies introduce the underlying force of space on these relationships. The context affects the relationships between the variables. The characteristics of the environment affect the micro-level relationships. The spatial implications addressed in this research are efficacious to studies on gender wage gaps. In a unique manner this geographical research reveals the value of spatial variations in gender wage gaps. It focusses on the importance of place. Where the person is and the characteristics of that environment affect the relationships associated with gender wage gaps.

The Expansion Method (Casetti, 1972) treats the relationships as if context does affect them. The useful idea of place and context are addressed in this methodological approach. The relationships are different in different
environments. The Expansion Method reveals the drifts in the relationships across these environments. This approach does not remove the relationships from their context. It assumes the environment is an underlying force which controls the relationships in the model.

Geographers are poised to address the spatial realities of the relationships by examining them within their context. The context is a pervasive factor affecting the relationships. Geographers are concerned with identifying this seemingly impact of space on the relationships.

The Expansion Method provides an avenue to ask theoretical questions concerning the drifts in the parameters. It is implemented here to reveal the drifts in the relationships across differing metropolitan environments. The relationships between an individual's income and his/her individual characteristics are affected by the metropolitan environmental context.

This work attempts to identify these relationships and the impact of differing variables on incomes of both men and women. The relationships identified are then examined across different environments. The assumption is that the relationships between educational attainment, age and other variables and income vary according to context. An individual receives different outcomes in terms of income, based not only on his/her individual characteristics but
also on the characteristics of his/her environment. Where the person is affects the relationships between his/her individual characteristics.

This work examines these relationships and the drifts in them across different environments for men and women, comparing and contrasting the gender variations in these drifts in relationships. The relationships are examined at the micro-level for the individual and his/her characteristics and studied within the contextual variation at the macro-level of the metropolitan area.

The objective of these analyses is to compare gender wage differentials associated with identical environments and with identical values of individual predictor variables. The research examines drifts across environments at the macro-level given the same variables and the same environments. These analyses contrast these drifts for females, vis-à-vis males. Two separate equations are used: one for male incomes and another for female incomes.

4.1 APPLICATIONS OF THE EXPANSION METHOD

The Expansion Method paradigm has been introduced in many varying applications. This rigorous approach has proven its versatility and wide ranging depth. It is a research philosophy and methodology that has far reaching capabilities in the social sciences. Other approaches
could benefit from its abilities to reveal contextual variations in relationships.

Casetti (1972, 1982, 1986) developed the methodology that led to many varying applications of the approach. The Expansion Method was used in research on population dynamics. Kodras (1986) examined the work disincentive effect of welfare and its spatial variances. The welfare system was also the subject of an application by Jones (1987). He used the Expansion Method to reveal contextual variations in the characteristics of regional labor markets to affect the poverty-welfare curve.

Hanham and Brown (1976) applied the Expansion Method to the context of regional economic development. They examined the waves of diffusion of innovation through the drifts in the parameters. The third world setting also has been used for applications of the Expansion Method approach. Pandit (1987) examined sectoral labor allocation during development and incorporated the Expansion Method to study the spatial and temporal variations. In addition, Krakover (1984) applied the Expansion Method to metropolitan dynamics.

These are but a few of the varied and numerous applications of the Expansion Method. This research on gender relations develops a new area of applications of the Expansion Method. This study is a part of a growing body of
literature in the Expansion Method paradigm. This new area of applications in gender relations is rich with opportunities and applications. This paradigm can enhance the comprehension in the realities of the factors associated with gender wage gaps.

4.2 RESEARCH METHODOLOGY

The Expansion Method is a technique and a philosophy. It suggests investigations of whether and how relationships drift across contexts. Namely, whether they hold with different parameter values at different points of substantively meaningful contexts. Specifically it suggests investigating the empirical currents and as well as the theoretical rationale of functional relationships. As a technique the Expansion Method specifies a sequence of precisely defined steps for generating models encompassing both an initial relationship and its contextual drift.

The Expansion Method techniques involve the following: a) an initial model is defined with at least some of its parameters in letter form, b) some or all of these parameters are redefined by expansion equations into functions of environmental variables or random variables, and c) substitution of the expanded parameters as specified in the expansion equations for the corresponding parameters appearing in the initial model. A terminal model is deter-
mined encompassing both the initial relation and its contextual drift. Upon estimation, the terminal model can be used to test hypotheses concerning the drift/stability of the initial formulation and to produce mathematical portraits of its drifts if they exist.

The application of the Expansion Method to the research problem in this study can be exemplified as follows. A simplified model relating individual characteristics to income is assumed. The individual characteristics selected are age (AGE) and education (EDU). It is well known that age affects income nonlinearly, since income increases to a lesser extent or declines as people grow older. The simplified relationship used here is as follows

\[(1) \quad \text{INC} = a + b\text{AGE} + c\text{AGE}^2 + d\text{EDU} + e\]

This relationship is the initial model. The purpose of this study is investigating whether and to what extent this relationship holds with different parameter values across contexts. The environmental or contextual variable used in this simplified example is logarithm of the population of the metropolitan area, POP. The potential drift of equation (1) with the size of the metropolitan area can be formalized by the following expansion equations.

\[(2) \quad a = a_0 + a_1\text{POP}\]
\[(3) \quad b = b_0 + b_1\text{POP}\]
\[(4) \quad c = c_0 + c_1\text{POP}\]
\[(5) \quad d = d_0 + d_1\text{POP}\]
The expansion equations model the potential variation of the effects represented by the parameters in the initial formulation. Consider, for instance, the parameter $d$ that stands for the effect of education on income. Since the intent is to investigate whether this effect is different in metropolitan areas of varying size, the expansion equations are used. Equation (5) in fact defines, the effect of education on income, as a function of the size of the metropolitan area.

By replacing the parameters in the initial model with the right hand sides of the expansion equations (2) through (5) the following terminal model is obtained.

(6) $INC = a_0 + a_1 POP +$
+ $b_0 AGE + b_1 AGE\cdot POP +$
+ $c_0 AGE^2 + c_1 AGE^2 \cdot POP +$
+ $d_0 EDU + c_1 EDU \cdot POP + e$

The terminal model incorporates the relationship expressing the effects of age and education on income captured by the initial model as well as the variation of these effects with the size of the metropolitan area.

Upon estimation, the terminal model reveals not only whether age and education have significantly affected income, but also whether these effects do indeed vary with size of the metropolitan area. Conclusions on both points are easily extracted by determining which estimated coeffi-
coefficients are significantly different from zero. In particular, if none of the terms in which the population variable appear are significant, the initial model is stable with respect to the size of the metropolitan area. In other words, the contextual or environmental variation of the type hypothesized is not supported by the data. If, instead, terms in which POP appears are significant, then the effects of age and education on income do vary with the size of the metropolitan area.

An empirical estimate of the relationship was carried out for the female data set (equation 6). This estimation, however, is regarded as a simplified illustration designed to clarify in specifics the approach employed in this dissertation. The full fledged analyses are those carried out using the larger number of individual and contextual variables that are reported later in the paper. Upon estimation the following estimated terminal model was obtained.

\[
\begin{align*}
\text{INC} &= -2536.181 - 576.222 \text{ POP} + 103.234 \text{ AGE} \\
&\quad - 28.995 \text{ AGE} \times \text{ POP} - 0.896 \text{ AGE}^2 - 0.312 \text{ AGE}^2 \times \text{ POP} \\
&\quad - 154.586 \text{ EDU} + 36.404 \text{ EDU} \times \text{ POP} \\
R^2 &= 0.158
\end{align*}
\]
The interpretation of the estimated terminal model is best carried out by extracting from it the estimated expansion equations that it implies, which are:

(8) \( a = -2536.181 - 576.222 \)

(9) \( b = 103.234 + 28.995 \text{ POP} \)

(10) \( c = -0.896 - 0.312 \text{ POP} \)

(11) \( d = 154.586 + 36.404 \text{ POP} \)

The estimated expansion equations are obtained by replacing the letter parameters appearing in the expansion equations (2) through (5) with their estimated numerical counterparts appearing in the estimated terminal model. The estimated expansion equations reveal the occurrence and nature of the contextual variation revealed between the data. The occurrence of such variation is not focussed upon in this example since the full model was estimated, and even variables that are significant are retained. If stepwise regression were used, the occurrence of contextual variation as is its nature can be easily visualized from the expansion equations.

The expansion equations in this simplified example reveal that the effect of education is stronger in larger metropolitan areas. In order to interpret the variation of the effects of the size of the metropolitan area on age, the expansion equations (9) and (10) are used to produce the graph in figure 2. The graph shows the effect of age
(for ages 16 to 65) in the form of a curve in which this effect is evaluated. The two curves correspond to two typical metropolitan areas of 100,000 and 5 million people. The curves show that for larger metropolitan areas older people experience lower incomes. This is consistent with expectations since, in more competitive, mobile labor markets found in larger urban centers, individuals in favorable circumstances are more successful in obtaining higher financial rewards. At the same time, individuals in a weaker bargaining position are perhaps less likely to be cushioned by the informal protection mechanisms that are more likely to exist in traditional environments.

The interpretation of equation (8) is straightforward. Equation (8) is the expansion of the intercept term in the initial model, and identifies the direct impact of urban size on income. This is a direct impact in contrast with the impacts of size captured between other expansion equations in which urban size impacts the effects of education and age. The direct impact of size on income is negative since the coefficient of POP in the expansion equation is negative.

The relationship between a woman's income and her education is positive. The higher the educational attainment level, the greater her salary outcomes. AGE is positive indicating the age-wage increment and AGE2 is negative
Figure 2: The Effect of Age on Income
reflecting the age-wage penalty. The initial model demonstrates that women with higher educational attainment levels and older women have higher incomes. However, the oldest women experience a drop in income potential.

The terminal model reveals the effects of the population size of the metropolitan area on the relationships noticed in the initial model. To determine these effects the parameters are expanded to identify the functions of the parameters. This approach reveals the drifts in the parameters in the initial model. The positive relationship between EDU and INC is then examined to determine the impacts and effects POP has on this positive relationship between EDU and INC.

The results of the terminal model reveal the contextual drifts in the relationships found in the initial model. Since the AGE * POP variable enters the stepwise regression as significant, the positive relationship between AGE and INC varies according to context. The positive relationship between AGE and INC indicates the older the woman, the greater her income. The positive relationship between AGE * POP and INC indicates a greater age-wage increment effect in larger-sized metropolitan areas. The contextual variable (POP) positively impacts on AGE.

The negative relationship between AGE2 and INC reveals the decrease in income at the oldest ages. In the terminal
model the negative relationship between AGE2 and INC is revealed to be contextually variant. Because AGE2*POP is significant so the relationship between AGE2 and INC varies across different metropolitan areas of varying sizes. Since the relationship between AGE2*POP and INC is negative, the effect that the size of the metropolitan area has on the age-wage penalty increases for smaller sized metropolitan areas. In a smaller metropolitan area the age-wage penalty is greater for a woman than if she were in a larger metropolitan area.

Lastly, EDU also varies across different environments. The positive relationship between EDU and INC is affected by the size of the metropolitan area. A woman's income increases as her educational attainment level increases. In larger metropolitan areas this relationship is stronger than in smaller metropolitan areas. As the size of the metropolitan area grows, so does the positive impact a woman's educational attainment level has on her level of income.

In this example, the relationships between the dependent variable and the independent variables vary according to context. In this case the context is the size of the metropolitan area. In larger metropolitan areas an increase in a woman's educational attainment results in a higher income level to a greater degree than if she were in a
smaller sized metropolitan area. The age-wage increment effect is greater in larger metropolitan areas while the age-wage penalty effect is stronger in smaller metropolitan areas.

The objective of this segment of the dissertation is to clarify the working of the Expansion Methodology by a simplified example representing a scaled down version of the analyses presented in chapter six. The use of the Expansion Methodology to clarify gender income differentials in the analyses that follow is structured in terms of the scheme described briefly hereafter.

The same initial model relating income to individual characteristics is specified for males and females. These models are then expanded in terms of the same contextual variables. The two terminal models obtained are identical, but they are estimated first on the female data set and then on the male data set. The two estimated terminal models obtained are used to determine the predicted incomes, and, therefore, the predicted income differential for any specified individual characteristics and any values of the environmental variables. These estimated terminal models provide the matrix for determining income differentials for typical individuals and the contextual variation of income differentials.
The Expansion Method goes beyond the examination of the relationships among the independent variables and the dependent variables. Specifically it allows studying the drifts in these relationships across different environments. This research takes micro-level relationships of the individual and examines them at the macro-level across different environments. It studies the effect of the macro-environment on the micro-level of the individual. The spatial context affects these micro-level relationships and this research reveals the drift in those effects.
CHAPTER V
THE DATA SET

The Expansion Method is a different approach towards examining gender wage gaps. It investigates the relationships associated with gender wage gaps and examines the drifts in these relationships across different environments. The effects of macro-level characteristics of the metropolitan environment on the relationships between the individuals' attributes and gender wage gaps is examined. The micro-level relationships are affected by the macro-level environment.

Because the intent of this research is to examine the macro-level impacts of the effects of micro-level characteristics on the individual's income, two different data sets are required. A macro-level data set is employed to capture the environmental attributes of the metropolitan areas. The second data set identifies micro-level characteristics for the individual. The individual person is identified according to his/her specific attributes.
5.1 THE MICRO LEVEL DATA SET

The data for these analyses are 1980 census data. Two data sets are employed: one a micro-data set and the second is aggregate data for metropolitan areas. The first data set is drawn from the 1980 Public Use Micro-data Sample File B. The file contains a 1% sample of respondents from the long form questionnaire of the 1980 Census which was sent to 18% of the households. These individual level data are employed for all of the 317 metropolitan areas in the United States. This file was divided into two separate files of male respondents and female respondents. Only persons aged 16 to 65 were included in the two data sets. Persons who worked less than 30 hours per week and/or less than 26 weeks per year were excluded. The resulting data sets included 784,987 total cases. The female data set included 294,459 observations, while the male data set was composed of 490,528 cases.

The variables identified are AGE, AGE2, MAD, WHI, EDU, WHC, OIN, and INC. AGE is represented in whole year increments, AGE2 is (AGE)^2, EDU is the highest grade of school attended with a range of 0 to 22, INC is the annual wage or salary income for the individual, and OIN is any other household income. The midpoint of $10 intervals is used for the coding of INC so that the range is $5-$74,995. In the original data set all incomes of $75,000 or more are
coded the same, $75,000. Therefore, the wealthy extreme is aggregated together. For this reason the group was excluded from the study.

The remaining variables are coded as dummy variables. For married individuals the MAD variable equals 1; for widowed, divorced, separated or single persons the value is 0. The variable WHI equals 0 for nonwhites and 1 for whites. White collar occupations are coded 1 for WHC and blue collar jobs are 0 (Table 9). The distributions of the variables are displayed in Table 10.

Table 9
Micro Variables List

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGE</td>
<td>age in single years</td>
</tr>
<tr>
<td>AGE2</td>
<td>$(AGE)^2$</td>
</tr>
<tr>
<td>MAD</td>
<td>married persons</td>
</tr>
<tr>
<td>WHI</td>
<td>white persons</td>
</tr>
<tr>
<td>EDU</td>
<td>highest grade of school attended</td>
</tr>
<tr>
<td>WHC</td>
<td>white collar occupation</td>
</tr>
<tr>
<td>OIN</td>
<td>other household income</td>
</tr>
<tr>
<td>INC</td>
<td>annual wage or salary income</td>
</tr>
</tbody>
</table>
Table 10

Micro Variable Distributions

<table>
<thead>
<tr>
<th></th>
<th>Female Mean</th>
<th>Standard Deviation</th>
<th>Male Mean</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGE</td>
<td>36.967</td>
<td>12.750</td>
<td>37.910</td>
<td>12.608</td>
</tr>
<tr>
<td>MAD</td>
<td>0.576</td>
<td>0.494</td>
<td>0.725</td>
<td>0.447</td>
</tr>
<tr>
<td>WHI</td>
<td>0.836</td>
<td>0.370</td>
<td>0.873</td>
<td>0.333</td>
</tr>
<tr>
<td>EDU</td>
<td>14.774</td>
<td>2.725</td>
<td>14.819</td>
<td>3.197</td>
</tr>
<tr>
<td>WHC</td>
<td>0.237</td>
<td>0.425</td>
<td>0.259</td>
<td>0.438</td>
</tr>
<tr>
<td>OIN</td>
<td>15376.167</td>
<td>13495.578</td>
<td>10329.154</td>
<td>9579.205</td>
</tr>
<tr>
<td>INC</td>
<td>9570.703</td>
<td>5818.199</td>
<td>15697.657</td>
<td>10679.108</td>
</tr>
</tbody>
</table>

The distributions reveal the differences in the male and female populations used in these analyses. The women are younger, less educated, have less income, and more other sources of income. In addition, there are proportionately more married men, white men, and men employed in white collar occupations than there are women.

5.2 THE MACRO-LEVEL DATA SET

The macro-level data set of aggregated data was drawn from the 1980 Summary Tape File 3C. This is a 18% sample of the total population drawn from the long form questionnaire. Aggregations were made at the metropolitan area level. The 1980 definition of a metropolitan area or SMSA (Standard Metropolitan Statistical Area) is used. An SMSA consists of a city with at least 50,000 people and the county in which it lies. Any contiguous counties that are considered socially and economically connected to the central county
are also included in the metropolitan area. Commuting data are used to determine the degree of connectivity. SMSA's in New England are defined by towns and cities rather than counties. In some cases, smaller cities of 25,000 to 50,000 can be considered as an SMSA if the city's urbanized area (the city and its closely surrounding area based on population densities) is at least 50,000 and the total metropolitan population is 100,000 or more (Bureau of the Census, 1980). The variables included are listed in Table 11 and their distributions are identified in Table 12. The size of the SMSA's in the sample range from 57,118 to 9,120,346.
Table 11
Macro Variables List

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>POP</td>
<td>logarithm of the total population for the SMSA</td>
</tr>
<tr>
<td>HSG</td>
<td>percent of high school graduates</td>
</tr>
<tr>
<td>PCI</td>
<td>per capita income</td>
</tr>
<tr>
<td>PNW</td>
<td>percent nonwhite</td>
</tr>
<tr>
<td>PWC</td>
<td>percent in white collar occupations</td>
</tr>
<tr>
<td>PEM</td>
<td>percent employed in manufacturing industries</td>
</tr>
<tr>
<td>NCF</td>
<td>number of children per female</td>
</tr>
<tr>
<td>WLF</td>
<td>females in paid labor force/persons in paid labor force</td>
</tr>
<tr>
<td>SHF</td>
<td>single female householders/single person householders</td>
</tr>
</tbody>
</table>

Table 12
Macro Variable Distributions

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>POP</td>
<td>12.552</td>
<td>0.980</td>
</tr>
<tr>
<td>HSG</td>
<td>0.676</td>
<td>0.081</td>
</tr>
<tr>
<td>PWC</td>
<td>0.223</td>
<td>0.037</td>
</tr>
<tr>
<td>PNW</td>
<td>0.133</td>
<td>0.101</td>
</tr>
<tr>
<td>PCI</td>
<td>7142.201</td>
<td>1068.794</td>
</tr>
<tr>
<td>NCF</td>
<td>1.293</td>
<td>0.160</td>
</tr>
<tr>
<td>SHF</td>
<td>0.807</td>
<td>0.028</td>
</tr>
<tr>
<td>PEM</td>
<td>0.226</td>
<td>0.100</td>
</tr>
<tr>
<td>WLF</td>
<td>0.428</td>
<td>0.021</td>
</tr>
</tbody>
</table>
5.3 PROBLEMS WITH THE DATA SET

One of the strengths of this research is the size of the data set. The 784,987 cases create a large sample which provides greater reliability of the results. The size of the sample simply cannot be any better. The massive size of this data set brings greater reliability and several problems, too. Regression analyses utilizing such large data files require large amounts of computer time and resources.

This chapter identifies some of the key aspects of manipulating such large data files. First, the creation of the data set, drawn from an even larger set of data files is discussed. The manipulation of this data set requires additional maneuvering of computer and space restrictions.

The data set utilized in this research was drawn from the micro-data files from the 1980 United States Census. File B is the sample for all SMSA's in the United States. The files are released on a state by state basis. Therefore, the data for all SMSA's in one state are located on one file.

In order to create a United States file for all metropolitan areas in the United States, 51 files must be concatenated into one file. This United States data file for SMSA's is composed of a sampling of all persons.
This research is concerned with working-age persons, so an extraction of the data set is necessary. At this point the data set is also divided into a female data set and a male data set. Selections were made for persons 16-64 years of age, employed more than 26 weeks, and more than 29 hours per week. The incomes coded $75,000 were also excluded because persons with more than $75,000 in income were coded $75,000. OIN and AGE2 are each calculated and each of the dummy variables are assigned their values. The resulting SAS (Statistical Analysis System) program for the male data set is listed in Appendix A.

Additional space and time allocations were required because of the magnitude of the data set. Within the JCL these adjustments were made. First, the REGION was increased to 4096K and TIME to 5 minutes. The JOBPARM statement also requires increasing TAPEIO, DISKIO, and LINES which is not out of the ordinary.

On the EXEC SAS statement, which calls for the execution of the statistical package, time and work space must also be increased. The work space was increased to "450,5." This indicates the initial try will require 450 cylinders to begin execution of the job. During normal usage times this amount of space is almost never available. The programs must be run at offpeak hours: after midnight during the week or on weekends. Even then, the space may not be
available. If the program begins to run and needs more than 450 cylinders it will request more cylinders in increments of 5 at a time. It will repeat these additional requests no more than 12 times. If the total space required is not available then the program will ABEND (abnormal end) and be cancelled. The programmer must resubmit at another time when more space might be available.

This additional work space was required to calculate the correlation matrices. The regression analyses also require excess space, although not as much. However, this massive amount of space required for each procedure means that each run must be submitted separately. Therefore, for the males one program is submitted to calculate the correlation matrix, one program is also submitted for each regression on the expansions, and one program for the final model containing all expansions. The same procedure is replicated for the female data set.

The final regression analyses including all of the expansion variables created an even greater demand for space. Essentially no more space could realistically be requested of the mainframe so some creative use of space was required. The resulting program is in Appendix B. The REGION and TIME requirements remain high in the JCL. The JOBPARM statement requires increases in the TAPEIO and
DISKIO because more tapes will be utilized as well as more
disk space. On the EXEC SAS statement the WORK and TIME
statements are the same, however, an additional SORT state­
ment is necessary to give SAS more space for sorting.

The creative use of space is also identified in the JCL.
Because these regressions require inputting two data sets:
the micro-level data set of over 490,000 cases for the men
and the macro-level data set of 317 cases the program would
use even more space. Therefore, rather than use the work
space on the mainframe this program uses blank tapes as the
work space. Three new tapes are added in the SETUP state­
ments and are used as work space.

The first work space required is utilized for inputting
the two data sets. The micro-level data set is stored on
TAPE01 and TAPE02, while the macro-level data set is on
disk. The first work space is on disk and is the normal
source of work space.

The merging of the two data sets requires the utiliza­
tion of a second source of work space. The excess space
available on the three blank tapes: TAPE03, TAPE04, and
TAPE05 is utilized. The statement in the SAS program

    DATA WORK2. THREE;

explicitly identifies the work space to be utilized. It
refers back to the JCL statement identifying WORK2 as the
three blank tapes.
Once again, this program must be run at offpeak times in order to acquire the amount of space and time required. The turnaround time for the program’s execution can require several attempts and resubmittals which stretch into days. Many times it can be submitted at 8:00 A.M. for that evening’s midnight runs but will not execute that evening. Usually it needs to be run on the weekends. Even though it is in the queue to execute, its requirements for time and space are often the highest of all jobs submitted, so it will be last in the queue. It will have the lowest priority and will never have the opportunity to execute.

Once the program begins executing it can "execute" for several hours (partially due to the number of tape mounts). Therefore, it must be submitted at the very beginning of the slack or nonpeak time frame. If it does not begin to execute until 4:45 A.M. and the computer "goes down" at 5:00 A.M.; then it will ABEND and be cancelled.

It can also be costly. If it were to run during normal usage times, it would be at least $500. However, since it is executed during offpeak hours, the slack time discount reduces costs to around $25. This is for only the one program which calculates the terminal model of all expansions for the male equation.

This research addresses both the macro-level characteristics and micro-level relationships. The effects of the
macro-level environment of the metropolitan area on gender wage gaps and the relationships associated with them at the micro-level are the focus of this research. Two data sets are employed in these analyses: one identifying micro-level attributes and another measuring characteristics of the metropolitan environment. The micro-level data set is comprised of nearly 800,000 cases which creates varying difficulties in the manipulations, calculations, and statistical analyese of the data. The large amounts of time and work space required on the mainframe computer test the limits of its capabilities.
CHAPTER VI
ANALYZING CONTEXTUAL AND GENDER VARIATIONS IN INCOME

This research examines the relationships between income and the variables affecting income levels. The contextual variations in these relationships are revealed through the utilization of the Expansion Method. The study is a comparative analysis of women's and men's incomes, employing a large micro-level data set of nearly 800,000 cases and a macro-level data set of the 317 metropolitan areas in the United States.

The methodological framework incorporates two separate models: one for men and another for women. Each resultant model reveals the drifts in the relationships (between income and the micro-level variables associated with it) across different macro-level environments. Different environmental characteristics of the SMSA affect the impacts of the individual-level variables on income. The relationships between the independent variables are not constant over different environments. The characteristics of the SMSA affect these relationships.
These contextual variations vary by gender. The extent of the impact that an environmental characteristic has on the relationships between the independent variables and the dependent variable is different for women, vis-a-vis men. Women's incomes, vis-a-vis men's incomes, are affected differently by contextual variations. This research seeks to reveal the gender variations in the spatial relationships of the factors affecting gender wage gaps. The macro-environment affects the relationships among the individual's characteristics and his/her income differently for men than for women.

The attributes of the environment impact on the effects of the individual's characteristics on his/her income. The questions addressed here are whether, how, and to what extent the effects of the individual characteristics on income vary as a result of changes in context. The size of the metropolitan area is expected to impact on the effects of education, white collar employment, traditional family lifestyles and ethnicity have on a person's income. Larger metropolitan areas provide varying types of opportunities which impact on the effects that the individual's personal attributes have on his/her income. A well-educated person can expect higher income, but does this vary in larger SMSA's, vis-a-vis smaller metropolitan areas? Is this educational payoff higher in metropolitan areas with proportionately more white people?
The characteristics of the metropolitan area influence the effects that varying personal characteristics have on income. An SMSA with more highly educated people and more white collar jobs certainly must impact on the relationship between ethnicity and income. Because nonwhites are less educated and more concentrated in blue collar jobs, an SMSA with high proportions of white collar jobs or any job requiring higher educational credentials provides fewer opportunities for nonwhites.

These are some of the issues which are discussed and examined in this study. The research is concerned with addressing the impact that context has on the effects of individual characteristics on income.

6.1 FINDINGS

6.1.1 Correlation Matrices
The correlation matrix for females is shown in Table 13 and Table 14 is the male correlation matrix. The correlations are low because of the size of the data sets involved. With such large data sets of almost 300,000 and 500,000 the correlations are expected to be low. All of the correlations are below 0.5, except, of course, AGE and AGE2.

The two gender separated correlation matrices for these variables show many similarities in the relationships among the variables. However, several variables exhibit gender variations in these relationships.
Table 13

Correlation Matrix for Female Model

<table>
<thead>
<tr>
<th></th>
<th>AGE</th>
<th>-----</th>
<th>0.989</th>
<th>0.143</th>
<th>0.034</th>
<th>-0.169</th>
<th>0.013</th>
<th>0.021</th>
<th>0.134</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td>AGE2</td>
<td>0.989</td>
<td>-----</td>
<td>0.112</td>
<td>0.043</td>
<td>-0.182</td>
<td>-0.002</td>
<td>0.013</td>
<td>0.110</td>
</tr>
<tr>
<td>(2)</td>
<td>MAD</td>
<td>0.143</td>
<td>0.112</td>
<td>-----</td>
<td>0.070</td>
<td>-0.037</td>
<td>0.012</td>
<td>0.314</td>
<td>-0.017</td>
</tr>
<tr>
<td>(3)</td>
<td>WHI</td>
<td>0.034</td>
<td>0.043</td>
<td>0.070</td>
<td>-----</td>
<td>0.084</td>
<td>0.048</td>
<td>0.095</td>
<td>0.021</td>
</tr>
<tr>
<td>(4)</td>
<td>EDU</td>
<td>-0.169</td>
<td>-0.182</td>
<td>-0.037</td>
<td>0.084</td>
<td>-----</td>
<td>0.466</td>
<td>0.068</td>
<td>0.301</td>
</tr>
<tr>
<td>(5)</td>
<td>WHC</td>
<td>0.013</td>
<td>-0.002</td>
<td>0.012</td>
<td>0.048</td>
<td>0.466</td>
<td>-----</td>
<td>0.034</td>
<td>0.097</td>
</tr>
<tr>
<td>(6)</td>
<td>OIN</td>
<td>0.021</td>
<td>0.013</td>
<td>0.314</td>
<td>0.095</td>
<td>0.068</td>
<td>0.034</td>
<td>-----</td>
<td>-0.011</td>
</tr>
<tr>
<td>(7)</td>
<td>INC</td>
<td>0.134</td>
<td>0.110</td>
<td>-0.017</td>
<td>0.021</td>
<td>0.301</td>
<td>0.097</td>
<td>-0.011</td>
<td>-----</td>
</tr>
</tbody>
</table>
Table 14

Correlation Matrix for Male Model

| (1) AGE | ------ | 0.989 | 0.356 | 0.051 | -0.113 | 0.053 | 0.018 | 0.234 (1) |
| (2) AGE2 | 0.989 | ------ | 0.317 | 0.053 | -0.135 | 0.037 | 0.036 | 0.199 (2) |
| (3) MAD | 0.356 | 0.317 | ------ | 0.070 | -0.006 | 0.058 | -0.104 | 0.226 (3) |
| (4) WHI | 0.051 | 0.053 | 0.070 | ------ | 0.132 | 0.070 | 0.030 | 0.110 (4) |
| (5) EDU | -0.113 | -0.135 | -0.006 | 0.132 | ------ | 0.462 | 0.070 | 0.264 (5) |
| (6) WHC | 0.053 | 0.037 | 0.058 | 0.070 | 0.462 | ------ | 0.003 | 0.234 (6) |
| (7) OIN | 0.018 | 0.036 | -0.104 | 0.030 | 0.070 | 0.003 | ------ | -0.202 (7) |
| (8) INC | 0.234 | 0.199 | 0.226 | 0.110 | 0.264 | 0.234 | -0.202 | ------ (8) |
MAD associates differently with OIN and INC. The relationship between INC and MAD is reversed in the female matrix (-0.017), vis-a-vis the male matrix (+0.226). For males, per capita income increases for married men but for married females it decreases. Married women have decreasing incomes, vis-a-vis married men, who have increasing incomes.

Although MAD has a positive relationship with AGE in both matrices (+0.143 in the female and +0.356 in the male) and AGE2 (+0.112 in the female and +0.317 in the male), it is a much stronger relationship in the male matrix. As both men and women age, they are more likely to be married. However, older women have less of a tendency, indicating the greater proportions of older women, vis-a-vis older men, who are widowed, divorced and single.

OIN also related differently to MAD in the male matrix, vis-a-vis the female matrix. The strong positive relationship in the female matrix (+0.314) indicates OIN increases for married women. For men, OIN relates negatively to MAD (-0.104). The more likely a man is married, the more likely other household income decreases. However, an increase in the likelihood a woman is married increases her other household income. That relationship is stronger for women than the negative relationship between MAD and OIN for men. MAD has a greater positive effect on OIN for women, than the negative effect it has for men.
Gender variations are also revealed in the relationship between AGE2 and WHC. For women, AGE2 relates negatively to WHC (-0.002), but it relates positively (+0.037) for men. AGE2 primarily reflects the penalty affect of old age. A negative relationship indicates this age-wage penalty effect while a positive relationship indicates the absence of the penalty. For women, white collar occupations relate negatively to AGE2 revealing this penalty effect. However, the age-penalty effect for men is absent since AGE2 and WHC relate positively to each other.

6.1.2 Initial Models

The results of the initial model regressions are in Table 15 for females and Table 16 for males. Gender similarities in the relationships are revealed. All of the variables are significant in the male model: in the female model all but WHI are significant.

OIN relates negatively to INC for both males and females. As a person's income increases, his/her other household income decreases. The more money a person makes, the greater likelihood that he/she has a smaller contribution to the household income from other sources. People who receive higher incomes are more likely to have spouses who don't work or, if they do work, don't receive high wages. Lower income persons are more likely to receive income from other sources. They are more likely to have employed
Table 15

Regressions of Initial Model for Females

<table>
<thead>
<tr>
<th></th>
<th>CNST</th>
<th>QIN</th>
<th>AGE</th>
<th>AGE2</th>
<th>MAD</th>
<th>WHI</th>
<th>EDU</th>
<th>WHC</th>
<th>R²</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>9645.671</td>
<td>-0.005*</td>
<td>------</td>
<td>------</td>
<td>------</td>
<td>------</td>
<td>------</td>
<td>------</td>
<td>1.0E−4</td>
</tr>
<tr>
<td></td>
<td>(593.468)</td>
<td>(-6.137)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>-1200.566</td>
<td>-542.922*</td>
<td>-6.081*</td>
<td>------</td>
<td>------</td>
<td>------</td>
<td>------</td>
<td>------</td>
<td>0.042</td>
</tr>
<tr>
<td></td>
<td>(-11.494)</td>
<td>(95.554)</td>
<td>(-85.736)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>9686.151</td>
<td>------</td>
<td>------</td>
<td>------</td>
<td>-200.431*</td>
<td>------</td>
<td>------</td>
<td>------</td>
<td>1.0E−4</td>
</tr>
<tr>
<td></td>
<td>(588.332)</td>
<td></td>
<td></td>
<td></td>
<td>(-0.239)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>9300.408</td>
<td>------</td>
<td>------</td>
<td>------</td>
<td>------</td>
<td>323.218*</td>
<td>------</td>
<td>------</td>
<td>1.0E−4</td>
</tr>
<tr>
<td></td>
<td>(351.068)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(11.157)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>83.559</td>
<td>------</td>
<td>------</td>
<td>------</td>
<td>------</td>
<td>------</td>
<td>642.147*</td>
<td>------</td>
<td>0.090</td>
</tr>
<tr>
<td></td>
<td>(1.482)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(171.119)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>8606.502*</td>
<td>------</td>
<td>------</td>
<td>------</td>
<td>------</td>
<td>------</td>
<td>------</td>
<td>4070.040</td>
<td>0.089</td>
</tr>
<tr>
<td></td>
<td>(734.435)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(169.048)</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>-7812.640*</td>
<td>-0.012*</td>
<td>468.316*</td>
<td>-4.876*</td>
<td>-611.425*</td>
<td>15.332</td>
<td>507.011*</td>
<td>2365.472*</td>
<td>0.167</td>
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<tr>
<td></td>
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<td>(85.362)</td>
<td>(-71.337)</td>
<td>(-28.354)</td>
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</table>

Dependent Variable=INC
significant at 05 level

Regression Table of Initial Model for Female Model
Table 16
Regressions of Initial Model for Males

<table>
<thead>
<tr>
<th>CNST</th>
<th>OIN</th>
<th>AGE</th>
<th>AGE2</th>
<th>MAD</th>
<th>WHI</th>
<th>EDU</th>
<th>WHC</th>
<th>R²</th>
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<tr>
<td>1) 17465.504</td>
<td>-0.171*</td>
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<td>2) -14786.774</td>
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<td>1473.233*</td>
<td>-15.892*</td>
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<td>3) 11780.413</td>
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<td>5404.415*</td>
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<td>(416.053)</td>
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<td>4) 12583.266</td>
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<td>------</td>
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<td>5) 2623.073</td>
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<td>------</td>
<td>0.070</td>
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<td>(1.182)</td>
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<td>6) 14221.382</td>
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</tr>
<tr>
<td>7) -18648.335</td>
<td>-0.169</td>
<td>942.333</td>
<td>-9.364</td>
<td>2016.077</td>
<td>2048.242</td>
<td>774.880</td>
<td>2253.881</td>
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<td>(-15.552)</td>
<td>(85.362)</td>
<td>(-71.337)</td>
<td>(-28.354)</td>
<td>(0.572)</td>
<td>(121.366)</td>
<td>(90.238)</td>
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</tr>
</tbody>
</table>

Dependent Variable=INC
significant at 05 level

Regression Table of Initial Model for Male Model
spouses. Poorer people are more likely to have dual career families or to receive income from other sources such as public assistance. In a married-couple situation one person foregoes higher income while the other pursues higher income levels.

AGE is positively related to INC in both models, and AGE2 is negatively related. The AGE term reflects the age-wage increment and the AGE2 term represents the age-wage penalty. As a person ages, his/her income increases before it declines in the later years of his/her employed lifetime.

The person's educational attainment level also is positively related to the person's income. The higher the educational attainment, the higher the income. The educational investments people make in themselves result in higher income jobs. This is true for both men and women. The higher the educational credentials, the greater the opportunities for a higher-paying job. Higher-paying jobs require higher educational attainment levels.

A white collar job also means higher income levels for both men and women. WHC relates positively to INC in both regression equations. White collar jobs receive higher wages than do blue collar occupations.

Gender variations occur in the relationships between WHI and INC. The relationship between WHI and INC is positive
for both males and females, but it is only significant in the regression model for males. White men receive higher incomes than nonwhite men. White males are the corporate executives with the higher incomes, they possess jobs with prestige, power, and higher wages. Men of color have lower paying jobs, are less mobile because their wives are more likely to be employed, and have fewer skills and educational credentials necessary for the higher income occupations.

The only variable with an opposite effect on male incomes, vis-a-vis female incomes, is MAD. The relationship is negative (-611.425) for females indicating that married women have lower income by an average of $611. For males the relationship is positive (2016.077): incomes increase for married men. Marriage affects male incomes differently than female incomes.

Married women have lower incomes in this study. They are more likely to have income from their spouses and increased household and family responsibilities. Their incomes are lower because they are more likely to be in lower paying jobs. They defer their own career opportunities for their husband’s career opportunities and for their family responsibilities. These factors do not negatively affect men’s incomes. Men are less likely to reject career-enhancing moves and are less likely to remove themselves from the paid labor force and interrupt their careers.
The initial model for both men and women is expanded on nine different macro-level variables. These terminal models reveal the contextual variations in the relationships between income for each sex and the variables affecting income levels.

6.1.3 The Population Size Terminal Models

The first set of analyses examines the impact that the size of the population has on the effects of the independent variables on the individual's income. The relationships among the characteristics of the individual and his/her income are expected to be affected by the environmental attributes of large metropolitan areas versus small SMSA's.

Large SMSA's have a greater variety of occupational opportunities. More job opportunities are available for older persons, nonwhite persons, and highly educated persons. Jobs in many high-paying white collar occupations are available in these areas. The smaller metropolitan areas have more traditional lifestyles which impact on the income levels of the individual workers.

Given the expectations of these relationships, the Expansion Method was used to examine the gender variations in the impact population size has on the effects of different independent variables on the person's income. The terminal model is presented for both the female equation and the male equation for the stepwise regression analyses con-
taining only the significant independent variables and the full model containing all of the independent variables (Table 17).

The $R^2$ value is higher in the male models in all cases of this research because it is a larger data set. The estimated expansion equations are also presented. The constant is represented by the parameter $a$, $b$ is the parameter associated with $AGE$, $c$ is associated with $AGE^2$, $d$ with $MAD$, $e$ with $WHI$, $f$ with $EDU$, $g$ with $OIN$, and $h$ with $WHC$. First is a discussion of the results of these models and how the findings correspond with the expectations discussed earlier. The interpretations of these findings are then presented through the use of some typical cases.

The effect of $POP$ on $WHC$ ($WHC \cdot POP$) is significant in both the female and male models. Its positive relationship with $INC$ indicates that the larger the metropolitan area, the greater the effect $WHC$ has on $INC$. The size of the SMSA impacts on the effect a white collar job has on the person's income. For women, the positive effect $WHC$ has on $INC$ is not significant. For men, the relationship between $WHC$ and $INC$ is negative indicating a white collar job negatively impacts on a man's income. Since the relationship between $WHC \cdot POP$ and $INC$ is positive, this effect is greater in large metropolitan areas. In larger SMSA's the negative impact a white collar job has on a man's income is greater.
Table 17
Expansions into logarithm of population (POP)

<table>
<thead>
<tr>
<th></th>
<th>Stepwise</th>
<th>Male</th>
<th>Full</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Female</td>
<td></td>
<td>Male</td>
</tr>
<tr>
<td>CNST</td>
<td>-8130.913</td>
<td>-26106.947</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(-61.082)</td>
<td>(-12.617)</td>
<td></td>
</tr>
<tr>
<td>POP</td>
<td>-------</td>
<td>293.601</td>
<td>488.439</td>
</tr>
<tr>
<td></td>
<td>(8.573)</td>
<td>(3.313)</td>
<td></td>
</tr>
<tr>
<td>AGE</td>
<td>498.920</td>
<td>216.246</td>
<td>1249.405</td>
</tr>
<tr>
<td></td>
<td>(77.849)</td>
<td>(2.936)</td>
<td>(11.924)</td>
</tr>
<tr>
<td>AGE2</td>
<td>-5.901</td>
<td>-2.413</td>
<td>-13.184</td>
</tr>
<tr>
<td></td>
<td>(-47.228)</td>
<td>(-2.632)</td>
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</tr>
<tr>
<td>MAD</td>
<td>-273.339</td>
<td>-------</td>
<td>-630.979</td>
</tr>
<tr>
<td></td>
<td>(-10.912)</td>
<td>(-1.427)</td>
<td></td>
</tr>
<tr>
<td>WHI</td>
<td>439.301</td>
<td>968.027</td>
<td>-1142.777</td>
</tr>
<tr>
<td></td>
<td>(14.618)</td>
<td>(2.696)</td>
<td>(-2.146)</td>
</tr>
<tr>
<td>EDU</td>
<td>-------</td>
<td>735.817</td>
<td>613.899</td>
</tr>
<tr>
<td></td>
<td>(130.646)</td>
<td>(9.615)</td>
<td></td>
</tr>
<tr>
<td>OIN</td>
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<td>0.031</td>
<td>-0.143</td>
</tr>
<tr>
<td></td>
<td>(3.852)</td>
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<td>(-9.990)</td>
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<td>-3418.929</td>
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<td></td>
<td>(14.115)</td>
<td>(7.456)</td>
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</tr>
<tr>
<td>AGE*POP</td>
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<td>20.111</td>
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</tr>
<tr>
<td></td>
<td>(3.851)</td>
<td>(-2.468)</td>
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<td>(7.430)</td>
<td>(2.680)</td>
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<td>MAD*POP</td>
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<td>179.270</td>
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<td></td>
<td>(66.226)</td>
<td>(7.154)</td>
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<tr>
<td>WHI*POP</td>
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<td>295.065</td>
<td>280.661</td>
</tr>
<tr>
<td></td>
<td>(8.052)</td>
<td>(7.553)</td>
<td></td>
</tr>
<tr>
<td>EDU*POP</td>
<td>34.841</td>
<td>-------</td>
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<td>(107.828)</td>
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<td>(1.915)</td>
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<td>OIN*POP</td>
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<td>(-6.653)</td>
<td>(-1.962)</td>
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<td>WHC*POP</td>
<td>169.616</td>
<td>419.049</td>
<td>395.420</td>
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<td>(80.624)</td>
<td>(14.528)</td>
<td>(12.143)</td>
</tr>
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<td>R²</td>
<td>0.186</td>
<td>0.258</td>
<td>0.186</td>
</tr>
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</table>


Estimated Expansion Equations

**Female**

CNST:

(1) \( a = -3760.66 - 312.342 \) POP  
\( a = -26106.947 + 488.439 \) POP

AGE:

(2) \( b = 216.246 + 20.111 \) POP  
\( b = 1249.405 - 18.554 \) POP

AGE2:

(3) \( c = -2.413 - 0.199 \) POP  
\( c = -13.184 + 0.243 \) POP

MAD:

(4) \( d = -148.202 - 8.922 \) POP  
\( d = -630.979 + 223.719 \) POP

WHI:

(5) \( e = 968.027 - 36.652 \) POP  
\( e = -1142.777 + 280.661 \) POP

EDU:

(6) \( f = 15.313 + 33.760 \) POP  
\( f = 613.899 + 8.627 \) POP

OIN:

(7) \( g = 0.031 - 0.004 \) POP  
\( g = -0.143 - 0.002 \) POP

WHC:

(8) \( h = 68.214 + 164.696 \) POP  
\( h = -3418.929 + 395.420 \) POP

**Male**

CNST:

(1) \( a = -26106.947 + 488.439 \) POP

AGE:

(2) \( b = 1249.405 - 18.554 \) POP

AGE2:

(3) \( c = -13.184 + 0.243 \) POP

MAD:

(4) \( d = -630.979 + 223.719 \) POP

WHI:

(5) \( e = -1142.777 + 280.661 \) POP

EDU:

(6) \( f = 613.899 + 8.627 \) POP

OIN:

(7) \( g = -0.143 - 0.002 \) POP

WHC:

(8) \( h = -3418.929 + 395.420 \) POP

The negative relationship between WHC and INC is not the expected relationship. The relationship is negative perhaps because men with the highest paying managerial jobs were excluded from the data set (those with income greater than $75,000). It also can be attributed to the variety of jobs that are included in the variable WHC.

In the female equation the effect of POP on EDU (EDU*POP) relates positively to INC. The larger the metropolitan area, the greater the effect of EDU on INC. The relationship between EDU and INC is positive for women, so a higher educational attainment increases her income. In larger SMSA's this effect is greater than in smaller metropolitan areas. A woman's greatest opportunity to reap the benefits of her educational investment are in a large SMSA. A woman in a large SMSA is more likely to pursue career
advancements which pay more than a women in a smaller SMSA where traditional family oriented lifestyles prevail.

The impact of POP on OIN (OIN*POP) is negative in both models. In smaller metropolitan areas the impact of OIN on the individual's income is greater. OIN relates negatively to INC for men; as a man's income increases his other sources of income decrease. However, the relationship is not significantly affected by the size of the SMSA. For women, the relationship between OIN and POP is positive, indicating that as a woman's income increases, so do her other sources of income. An employed woman with a high-paying job is more likely to have a husband with a high-paying job, whereas a man with a high-paying job is more likely to have a wife who is unemployed or in a low-paying job. For women, that relationship varies according to the size of the metropolitan area. In smaller metropolitan areas it is stronger. In smaller SMSA's all incomes are lower.

Both people in a dual-career family tend to have lower-paying jobs. However, in larger SMSA's where nontraditional families are found, women pursue higher-paying jobs while their husbands forfeit their own career advancing opportunities. Men who are trailing-spouses, househusbands, or are employed in occupations which provide secondary sources of income for a family are in the more nontraditional family settings located in larger SMSA's.
A gender variation is revealed in the effect POP has on MAD (MAD*POP). For both men and women, the relationship between MAD and INC is negative, indicating lower incomes for married people, while single people receive higher incomes. The macro-environment affects this relationship for men, while it does not significantly affect the relationship for women. Single women receive higher incomes regardless of the size of the SMSA.

In the male model, the impact POP has on MAD is positive, indicating the larger the SMSA, the greater the effect. In larger SMSA's the negative relationship between MAD and POP is greater. A single man receives a higher income in larger SMSA's, vis-a-vis smaller metropolitan areas. Married men in larger SMSA's receive lower incomes than their male counterparts in smaller metropolitan areas. Single men are receiving higher incomes because they are free to choose higher paying jobs. They are more flexible and mobile without family responsibilities. They are at a greater advantage in large SMSA's because that is where the greater opportunities are located.

The impact of POP on WHI (WHI*POP) reveals another gender variation. For men, the size of the SMSA positively affects the relationship between WHI and INC, while the context has no significant effect in the female model. In larger SMSA's, nonwhite men have higher incomes than white
men relative to their smaller metropolitan area counterparts. The greater ethnic heterogeneity of larger SMSA's provides greater opportunities for nonwhites, but only for nonwhite men.

The effect of POP on AGE (AGE*POP) is not significant in either model. This reveals that the age-wage increment is not affected by the size of the metropolitan area. The impact of POP on AGE2 (AGE2*POP) is significant but only in the female model. The age-wage penalty for women is affected by the size of the metropolitan area. The effect is greater in smaller-sized metropolitan areas. In smaller SMSA's women receive a greater age-wage penalty effect. Greater opportunities for older women who are displaced homemakers, widows, or divorces are located in larger SMSA's. These women find fewer job opportunities in smaller SMSA's.

In order to succinctly interpret these relationships, some specific cases are identified and discussed. Using the terminal model for each gender, values for the different micro-level variables are substituted into the equation. Two different SMSA's, one small (100,000) and one large (5 million), were substituted in for POP. The results indicate the estimated income for a woman with the characteristics specified if she lived in a small SMSA and her expected income in a large metropolitan area. This is
repeated for the male equation so that a gender wage gap can be calculated.

To clarify, a typical case of a woman age 20 (AGE=20 and AGE2=400) who is single (MAD=0), white (WHI=1), a high school graduate (EDU=12), working in a white collar occupation (WHC=1), and without any other source of income (OIN=0) is assumed. The values for these variables are substituted into the female model, equation (12).

\[
12) \text{FINC} = -8130.913 + 498.920 \cdot \text{AGE} - 5.901 \cdot \text{AGE}^2 \\
- 273.339 \cdot \text{MAD} + 439.301 \cdot \text{WHI} + 0.032 \cdot \text{OIN} \\
+ 0.049 \cdot \text{AGE}^2 \cdot \text{POP} + 34.841 \cdot \text{EDU} \cdot \text{POP} - 0.004 \cdot \text{OIN} \cdot \text{POP} \\
+ 169.616 \cdot \text{WHC} \cdot \text{POP}
\]

This identifies the effect the size of the population in that SMSA has on the effect the other variables have on her income (FINC). The result is equation (13).

\[
13) \text{FINC} = -8130.913 + 498.920 \cdot 20 - 5.901 \cdot 20 \cdot 20 \\
- 273.339 \cdot 0 + 439.301 \cdot 1 + 0.032 \cdot 0 \\
+ 0.049 \cdot 20 \cdot 20 \cdot \ln(100,000) + 34.841 \cdot 12 \cdot \ln(100,000) \\
- 0.004 \cdot 0 \cdot \ln(100,000) + 169.616 \cdot \ln(100,000)
\]

Therefore, FINC is calculated as 6918.28. This female can expect to receive $6918 in income. The same procedure of substitutions is repeated for a metropolitan area with a population of 5 million. A woman living there can expect an income of $9294.
The same woman who earns $6918 in a small metropolitan area would increase her income by more than one third to $9294, in an SMSA with a population of 5 million. The size of the SMSA dramatically impacts on the effects her personal attributes have on her income. A man with identical characteristics notices an increase of more than 50% from $7815 to $11757. Figure 3 displays these gender wage gaps.

Young, white, high school-educated men who work in white collar jobs have a distinct advantage over their female counterparts. These are the initial starts at their careers and men are beginning at higher incomes. The gender wage gap in the small SMSA is $0.89 while it is wider, $0.79, in the larger SMSA. Both men and women receive higher incomes in larger SMSA’s, but men enjoy a greater advantage than women experience. The advantage of the large SMSA is present for both sexes but greater for men.

The greater opportunities in the large SMSA’s are received by both men and women. The greater number of white collar jobs are available for both genders and both are reaping the benefits over their counterparts in smaller SMSA’s. Men are receiving higher incomes, though, because of the type of white collar jobs in which they are employed, vis-a-vis women and their white collar jobs.

A second example comparing the different sizes of SMSA’s and the impact on the effects of the relationships is a
Expected Income
(where
AGE=20
MAD=0
WHI=1
EDU=12
WHC=1
OIN=0)

Figure 3: Population Size Gender Wage Gaps, case 1
37-year-old, married, nonwhite person with a college degree working in a white collar job with $10,000 of income from other sources. Such a woman would earn $10,980 in a small SMSA (100,000) while a man earns $16,406. In a larger metropolitan area both receive higher incomes of $13,930 for women and $19,895 for men. The gender wage gap is $0.67 in the small SMSA and $0.70 in the large metropolitan area. See Figure 4.

The size of the SMSA impacts on the effects of this person's attributes and his/her income. Larger SMSA's provide higher incomes for nonwhites who are college educated and in white collar jobs. Nonwhites in smaller metropolitan areas realize smaller earnings in return for their educational investments. This advantage is greater for women than men. The man's income increases by 21% while the woman's increases by 27%. A nonwhite woman in the large SMSA setting of more white collar jobs, higher educational attainment levels and fewer traditional family lifestyles enjoys a greater advantage than a nonwhite man.
Expected Income

(\text{where} \quad \text{AGE}=37, \quad \text{MAD}=1, \quad \text{WHI}=0, \quad \text{EDU}=16, \quad \text{WHC}=1, \quad \text{OIN}=10,000)

\$50,000 - \$48,000 - \$46,000 - \$44,000 - \$42,000 - \$40,000 - \$38,000 - \$36,000 - \$34,000 - \$32,000 - \$30,000 - \$28,000 - \$26,000 - \$24,000 - \$22,000 - \$20,000 - \$18,000 - \$16,000 - \$14,000 - \$12,000 - \$10,000 - \$8,000 - \$6,000 - \$4,000 - \$2,000

\begin{tikzpicture}
\begin{axis}[
    title={Population Size Gender Wage Gaps, case 2},
    xlabel={\text{ln(100,000)}},
    ylabel={\text{ln(5 million)}}
]\end{axis}\end{tikzpicture}
6.1.4 The Educational Attainment Terminal Models

The second set of analyses addresses the impact that the index of educational attainment level has on the effect of the characteristics of the individual on his/her income. A metropolitan area with a more highly educated population is one that has more white collar jobs since they are higher paying. More whites are in the SMSA because nonwhites have lower overall educational attainment levels. Less educated populations follow more traditional lifestyles. The results of the analyses reveal some patterns associated with these trends.

The effect of HSG on age is reflected in AGE*HSG and AGE2*HSG which are significant in both models. The higher the percentage of high school graduates in an SMSA, the greater the impact on the age-wage increment effect and the lesser the age-wage penalty effect. An increase in the educational index increases the effects of age on income. Both men and women experience an age-wage benefit which is stronger in SMSA's with an overall more highly educated population. This reflects the payoffs of experience that are greater in metropolitan areas with a more highly educated population.

The age-wage penalty is also affected by the educational index of the SMSA. In smaller SMSA's the age-wage penalty is stronger. Both men and women in metropolitan areas with
lesser educated populations experience a greater age-wage penalty than if they were in a higher educated metropolitan area. The higher educated SMSA provides greater opportunities for both men and women.

The percentage of high-school-educated persons also affects WHI and OIN; WHI*HSG and OIN*HSG demonstrate negative relationships with the dependent variable. As the educational attainment level increases in an SMSA, the relationship between ethnicity and income weakens. The positive relationship between WHI and INC is stronger in metropolitan areas with lower educational attainment levels. A white person receives higher income levels if he/she is in an SMSA with lower educational levels. In SMSA's with higher educational attainment levels the advantage of being white is lessened. As educational levels are increased for the population as a whole, the racial effect on wages diminishes. A lesser educated SMSA is a more traditional setting where the racial impacts on income is greater. The higher educated nonwhites who secure higher incomes are located in the higher educated metropolitan areas.

HSG also affects OIN in this manner. As educational attainment levels decrease the impact OIN has on INC strengthens. For males the relationship between OIN and INC is negative indicating an increase in individual income
Table 18
Expansions into % high school graduates (HSG)

<table>
<thead>
<tr>
<th></th>
<th>Female</th>
<th>Male</th>
<th>Female</th>
<th>Male</th>
</tr>
</thead>
<tbody>
<tr>
<td>CNST</td>
<td>-2334.528</td>
<td>-5526.997</td>
<td>-3653.252</td>
<td>-8698.179</td>
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<tr>
<td></td>
<td>(-8.097)</td>
<td>(-6.514)</td>
<td>(-2.620)</td>
<td>(-4.643)</td>
</tr>
<tr>
<td>HSG</td>
<td>-8294.417</td>
<td>-19934.873</td>
<td>-6413.953</td>
<td>-15407.045</td>
</tr>
<tr>
<td></td>
<td>(-16.699)</td>
<td>(-16.018)</td>
<td>(-3.204)</td>
<td>(-5.726)</td>
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<tr>
<td>AGE</td>
<td>------</td>
<td>68.624</td>
<td>162.808</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(1.027)</td>
<td>(1.702)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AGE2</td>
<td>------</td>
<td>-0.792</td>
<td>-2.011</td>
<td></td>
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<tr>
<td></td>
<td>(-0.947)</td>
<td>(-1.724)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MAD</td>
<td>-973.905</td>
<td>------</td>
<td>-1042.940</td>
<td>479.303</td>
</tr>
<tr>
<td></td>
<td>(-3.872)</td>
<td>(-4.020)</td>
<td>(1.193)</td>
<td></td>
</tr>
<tr>
<td>WHI</td>
<td>2264.712</td>
<td>4420.713</td>
<td>2283.967</td>
<td>4397.711</td>
</tr>
<tr>
<td></td>
<td>(7.142)</td>
<td>(9.210)</td>
<td>(9.119)</td>
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</tr>
<tr>
<td>EDU</td>
<td>492.933</td>
<td>926.170</td>
<td>493.972</td>
<td>916.498</td>
</tr>
<tr>
<td></td>
<td>(102.337)</td>
<td>(16.991)</td>
<td>(10.512)</td>
<td>(16.449)</td>
</tr>
<tr>
<td>OIN</td>
<td>0.025</td>
<td>-0.085</td>
<td>0.025</td>
<td>-0.080</td>
</tr>
<tr>
<td></td>
<td>(2.725)</td>
<td>(-6.565)</td>
<td>(2.728)</td>
<td>(-6.139)</td>
</tr>
<tr>
<td>WHC</td>
<td>1278.398</td>
<td>1292.707</td>
<td>1243.184</td>
<td>1219.474</td>
</tr>
<tr>
<td></td>
<td>(4.606)</td>
<td>(3.149)</td>
<td>(3.984)</td>
<td>(2.946)</td>
</tr>
<tr>
<td>AGE * HSG</td>
<td>729.671</td>
<td>1453.949</td>
<td>631.255</td>
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<tr>
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<td>(78.704)</td>
<td>(110.356)</td>
<td>(6.548)</td>
<td>(8.877)</td>
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<td></td>
<td>(-65.493)</td>
<td>(-89.198)</td>
<td>(-5.350)</td>
<td>(-6.816)</td>
</tr>
<tr>
<td>MAD * HSG</td>
<td>815.851</td>
<td>3424.390</td>
<td>914.901</td>
<td>2742.037</td>
</tr>
<tr>
<td></td>
<td>(2.257)</td>
<td>(62.211)</td>
<td>(2.454)</td>
<td>(4.761)</td>
</tr>
<tr>
<td>WHI * HSG</td>
<td>-3064.605</td>
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<td>-3091.832</td>
<td>-2670.419</td>
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<tr>
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<td>(-6.681)</td>
<td>(-3.893)</td>
<td>(-6.699)</td>
<td>(-3.832)</td>
</tr>
<tr>
<td>EDU * HSG</td>
<td>------</td>
<td>-287.205</td>
<td>-1.221</td>
<td>-272.865</td>
</tr>
<tr>
<td></td>
<td>(-3.652)</td>
<td>(-0.018)</td>
<td>(-3.397)</td>
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</tr>
<tr>
<td>OIN * HSG</td>
<td>-0.064</td>
<td>-0.118</td>
<td>-0.064</td>
<td>-0.124</td>
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<tr>
<td></td>
<td>(-4.862)</td>
<td>(-6.372)</td>
<td>(-4.857)</td>
<td>(-6.639)</td>
</tr>
<tr>
<td>WHC * HSG</td>
<td>1616.328</td>
<td>1195.902</td>
<td>1666.587</td>
<td>1300.328</td>
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<tr>
<td></td>
<td>(4.087)</td>
<td>(2.044)</td>
<td>(3.741)</td>
<td>(2.205)</td>
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<tr>
<td>R²</td>
<td>0.175</td>
<td>0.253</td>
<td>0.175</td>
<td>0.253</td>
</tr>
</tbody>
</table>
Estimated Expansion Equations

Female

CNST:
(1)\(a = -3653.252-6413.953 \text{ HSG}\)

AGE:
(2)\(b = 68.824+631.255 \text{ HSG}\)

AGE2:
(3)\(c = -0.792-6.441 \text{ HSG}\)

MAD:
(4)\(d = -1042.940+914.901 \text{ HSG}\)

WHI:
(5)\(e = 2283.967-3091.832 \text{ HSG}\)

EDU:
(6)\(f = 493.972-1.221 \text{ HSG}\)

OIN:
(7)\(g = 0.025-0.064 \text{ HSG}\)

WHO:
(8)\(h = 1243.184+1666.587 \text{ HSG}\)

Male

CNST:
(1)\(a = -8698.179-15407.045 \text{ HSG}\)

AGE:
(2)\(b = 162.808+1220.900 \text{ HSG}\)

AGE2:
(3)\(c = -2.011-11.436 \text{ HSG}\)

MAD:
(4)\(d = 479.303+2742.037 \text{ HSG}\)

WHI:
(5)\(e = 4397.711-2670.419 \text{ HSG}\)

EDU:
(6)\(f = 916.498-272.865 \text{ HSG}\)

OIN:
(7)\(g = -0.080-0.124 \text{ HSG}\)

WHO:
(8)\(h = 1219.474+1300.328 \text{ HSG}\)

accompanies a decrease in other household income. In SMSA's with an overall lower educational level of its population, the greater the effect a man's higher income has on lowering other household income. An increase in the educational attainment levels of the population in an SMSA accompanies a decrease in the effect a man's income has on OIN. As a man's income increases, his other sources of household income decreases. This effect is weakened by an increase in the overall education of the population in the metropolitan area. The more educated the population is, the greater the likelihood that an individual male's high income will accompany lower sources of other income. In these metropolitan areas men who are receiving higher incomes are more likely to have wives who are unemployed or employed in secondary occupations. These men are the primary sources of income.
Women in higher educated SMSA's who earn higher incomes tend to have husbands with higher incomes too. The highly educated SMSA is more likely to have the dual-career family with couples pursuing higher paying jobs.

The male model includes a significant contextual variation which is not in the female model. The effect of HSG on EDU (EDU*HSG) is significant in the male model. EDU is positively related to INC in both models, but this relationship only varies contextually for men. An increase in educational attainment levels accompanies an increase in income. The relative educational attainment level of the environment affects this relationship for men. The EDU*HSG variable indicates as the educational attainment level for an SMSA increases, the positive effect that the male's educational attainment has on his income decreases. The greater the educational attainment level for the environment, the lesser the impact the individual man's education has on his income. An increase in educational attainment in an SMSA weakens the advantage educated men enjoy.

In both models, the positive relationship between MAD*HSG and INC is revealed; HSG affects MAD. An increase in the educational attainment level of an SMSA increases the effect MAD has on INC. For females, the relationship between MAD and INC is negative which means single women receive higher incomes. This relationship is affected by
contextual variation in the index of educational attainment in the metropolitan area. In higher educated SMSA's single women receive higher incomes. In the lower educated, more traditional SMSA environment married women receive lower incomes as they forego career advancements for family obligations. Single women are more flexible to take advantage of the higher paying jobs in the metropolitan areas with high educational attainment levels where the greater job opportunities are located.

The higher educated metropolitan areas also have an effect on MAD for males. However, for men the relationship between MAD and INC is positive. Married men receive higher incomes than single men. This effect is stronger in higher educated SMSA's.

In both models, WHC relates positively to INC. White collar jobs generally have higher income levels than blue collar jobs. This relationship exists for both men and women and the macro-environment affects this relationship. WHC'HSG relates positively to INC. A person in a white collar job makes more money than if he/she were in a blue collar occupation. If he/she is in a metropolitan area with a more highly educated population he/she notices a greater impact on his/her income as a result of his/her white collar occupation.
The overall effect of these impacts reveals variations for specific cases. First, an older worker aged 55, white, married, a high school graduate, in a white collar occupation, and $10,000 in other income is discussed. The higher educated the overall population, the greater the incomes for the workers. A female with these characteristics can expect her income to increase from $9203 in an SMSA with only 41% of its population possessing a high school diploma to $12,417 in a metropolitan area with 88% of its population with high school diplomas. A man can expect an increase from $16,200 to $22,790, a 41% increase while women only realize a 35% increase. See Figure 5.

The impact of elevated educational levels on the determinants affecting incomes varies for men and women. An older woman receives far less money than does her male counterpart. The gender wage gap in less educated SMSA's is $0.57 and in more educated SMSA's, $0.54. The older white woman working in white collar jobs, living in a traditional family lifestyle receives much less than a man with similar characteristics. This is worse in less educated areas.

The woman receives a small age-wage increment effect. Her experience in the white collar job rewards her with very small income increases. Women are concentrated in low-paying white collar jobs. Men are in the high-paying
Expected Income (where AGE=55, MAD=1, WHI=1, EDU=12, WHC=1, O-IN=10,000)

$50,000-
$48,000
$46,000
$44,000
$42,000
$40,000
$38,000
$36,000
$34,000
$32,000
$30,000
$28,000
$26,000
$24,000
$22,000

Male

$20,000
$18,000
$16,000
$14,000
$12,000
$10,000
$8,000
$6,000
$4,000
$2,000

Female

$22,000
$20,000
$18,000
$16,000
$14,000
$12,000
$10,000
$8,000
$6,000
$4,000
$2,000

Population

ln(5 million) ln(100,000)

Figure 5: Educational Attainment Gender Wage Gaps, case 1
career tracks. They receive a higher return in the age-
wage increment. Even those men without college degrees
receive better incomes through the age-wage increment
effect than a woman without a college degree.

Another case reveals the large impact the context has on
the effects associated with gender wage gaps. A woman
receives a 26% increase in her income if she is in a higher
educated SMSA and she is 37, married, white, college educa
ted, a white collar worker, and receives $10,000 in other
income. A man receives a 27% increase. The higher educat­
ed SMSA presents greater opportunities and higher incomes
for married, well-educated whites in white collar occupa­
tions.

This impact is even greater for nonwhites with otherwise
identical characteristics. A nonwhite woman's income
increases 44% in higher educated SMSA's and nonwhite males
realize a 41% increase. Nonwhites with a college educa-
tion, employed in white collar jobs receive distinct advan­tages if the SMSA has a higher degree of higher educated
people. The opportunities presented in the higher educated
SMSA benefit nonwhites to a greater extent than whites.

The benefits are even greater for nonwhites who are not
college educated and in a blue collar job if they are also
37, married and have $10,000 in other sources of income.
Such a woman can expect a 60% increase in her income from
$6012 in a lower educated metropolitan area to $9628 in a more highly educated metropolitan area (Figure 6). An increase of 61% from $10,092 to $16,232 is estimated for a man. The gender wage gaps are low in both cases $0.60 in the lower educated and $0.59 in the higher educated SMSA’s.

The more educated SMSA provides a greater opportunity for increased wages for both nonwhite and white workers who are college educated and in a white collar job. The opportunities for higher paying white collar jobs are greater because of the increased educational credentials that white collar jobs require.

However, an even stronger pattern is the strong impact the index of educational attainment has on the effect of the relationships of a blue collar worker on income. In more highly educated SMSA’s nonwhites in a blue collar occupation and a high school diploma can expect to increase their incomes by nearly two-thirds. This is not gender specific. In these higher educated SMSA’s nonwhite blue collar workers are receiving higher paying jobs than if they were in lower educated SMSA’s. Higher educated whites are securing the white collar occupations, leaving the blue collar occupations open for the lower educated nonwhites.
Expected Income
(where
AGE=37
MAD=1
WHI=1
EDU=16
WHC=1
OIN=10,000)

$50,000
$48,000
$46,000
$44,000
$42,000
$40,000
$38,000
$36,000
$34,000
$32,000
$30,000
$28,000
$26,000
$24,000
$22,000
$20,000
$18,000
$16,000
$14,000
$12,000
$10,000
$8,000
$6,000
$4,000
$2,000

41%
88%

Male
Female

Figure 6: Educational Attainment Gender Wage Gaps, case 2
6.1.5 The White Collar Terminal Models

The impact of the proportion of white collar occupations in an SMSA on the effects of different individual characteristics on income is revealed in the next set of analyses. An SMSA with a high proportion of white collar occupations is more likely to have a high percentage of white persons and more persons with higher educational credentials. The age-wage increment effect is stronger in white collar SMSA's where the high-paying managerial jobs are earned as the worker progresses up the ladder of success. People with more traditional family lifestyles live in the blue collar SMSA's.

In these analyses the impact of the white collar index is discussed. PWC impacts on OIN in both models. As the proportion of white collar occupations in a metropolitan area increases, the effect that OIN has on INC decreases. In blue collar SMSA's other household income has a greater impact on per capita income. For men, the relationship between OIN and INC is negative. As a man's individual income increases his other sources of income decreases. For women the relationship between OIN and INC is positive, indicating that as other household income increases so does the woman's income. In a blue collar SMSA, vis-a-vis a white collar SMSA, a woman's income increases and a man's decreases if the other sources of household income increase.
### Table 19
Expansions into % white collar (PWC)

<table>
<thead>
<tr>
<th></th>
<th>Stepwise</th>
<th></th>
<th></th>
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</tr>
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<tbody>
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<td>Male</td>
<td>Female</td>
<td>Male</td>
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<tr>
<td>CNST</td>
<td>-766.179</td>
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<td>-1060.878</td>
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<td>(-0.820)</td>
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<td>(-7.888)</td>
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<td>699.531</td>
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<td>(10.700)</td>
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<td>(-3.454)</td>
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<tr>
<td>MAD</td>
<td>-343.629</td>
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<td>-456.678</td>
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<tr>
<td></td>
<td>(-13.706)</td>
<td>(3.760)</td>
<td>(-2.579)</td>
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<td>(10.196)</td>
<td>(2.686)</td>
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<td>(7.917)</td>
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<td>(2.161)</td>
<td>(-13.392)</td>
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<td>537.415</td>
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<td>(2.533)</td>
<td>(-7.252)</td>
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<td>AGE'PWC</td>
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<tr>
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<td>(8.054)</td>
<td>(4.681)</td>
<td>(7.583)</td>
<td>(4.681)</td>
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<td>(-6.066)</td>
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<td>(-5.676)</td>
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<tr>
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<td>5780.764</td>
<td>463.477</td>
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<td>(5.160)</td>
<td>(0.642)</td>
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<td>(0.642)</td>
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<tr>
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<td>7373.002</td>
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<td>(5.591)</td>
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<td>EDU'PWC</td>
<td>871.358</td>
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<tr>
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<td>(6.421)</td>
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<td>-0.136</td>
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<td>-0.138</td>
<td>-0.216</td>
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<tr>
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<td>(-5.910)</td>
<td>(-6.193)</td>
<td>(-5.655)</td>
<td>(-6.193)</td>
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<tr>
<td>WHC'PWC</td>
<td>7450.736</td>
<td>16634.298</td>
<td>7465.945</td>
<td>16634.298</td>
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<tr>
<td>R²</td>
<td>0.182</td>
<td>0.255</td>
<td>0.182</td>
<td>0.255</td>
</tr>
</tbody>
</table>
Estimated Expansion Equations

Female

\[
\begin{align*}
\text{CNST:} & \\
(1) a &= -1060.878 - 28853.462 \text{ PWC} \\
(2) b &= 160.909 + 1416.329 \text{ PWC} \\
(3) c &= -2.047 - 13.197 \text{ PWC} \\
(4) d &= -456.678 + 463.477 \text{ PWC} \\
(5) e &= 566.107 - 1049.530 \text{ PWC} \\
(6) f &= 267.863 + 887.946 \text{ PWC} \\
(7) g &= 0.013 - 0.138 \text{ PWC} \\
(8) h &= 533.971 + 7465.945 \text{ PWC}
\end{align*}
\]

Male

\[
\begin{align*}
\text{CNST:} & \\
(1) a &= -6391.625 - 52669.310 \text{ PWC} \\
(2) b &= 699.531 + 1262.221 \text{ PWC} \\
(3) c &= -8.110 - 7.455 \text{ PWC} \\
(4) d &= 1031.485 + 5780.764 \text{ PWC} \\
(5) e &= 876.399 + 7373.002 \text{ PWC} \\
(6) f &= 380.570 + 1430.010 \text{ PWC} \\
(7) g &= -0.115 - 0.216 \text{ PWC} \\
(8) h &= -2050.916 + 16834.298 \text{ PWC}
\end{align*}
\]

AGE·PWC and AGE2·PWC are significant in both models. PWC affects AGE and AGE2 for both men and women. Females receive considerably higher age-wage increments if they are in metropolitan areas with more white collar jobs. They can increase their income more in these SMSA's. The age-wage penalty effect is similar in both types of SMSA's. Men receive higher incomes than women and their age-wage increment effect is quite dramatic. They receive a great advantage in white collar metropolitan areas for realizing the income potentials of their careers. The age-wage penalty effect is the highest for males in blue collar SMSA's.

Two of the other variables relate positively to the dependent variable: EDU·PWC and WHC·PWC. The percentage of white collar occupations in a metropolitan area affects WHC and EDU. For both men and women, as their educational
attainment increases so does their income. This affect is greater in metropolitan areas with a higher proportion of persons in white collar occupations. A person realizes a greater increase in wages as his/her education increases if he/she is in a white collar SMSA. An SMSA with more white collar jobs means more returns for a person's educational attainment.

PWC also impacts on WHC since WHC*PWC relates positively to INC. In a white collar SMSA the impact WHC has on INC increases. For women, the relationship between WHC and INC is positive. In white collar SMSA's a white collar job for a woman means higher income. For men in that white collar SMSA, a blue collar job means higher incomes.

Other gender variations are revealed in the other two environmental variables: MAD*PWC and WHI*PWC. PWC affects both MAD and WHI. The relationship between MAD and INC varies contextually for males but not for females. For men, the positive relationship between MAD and INC is positively affected by a higher percentage of white collar occupations in the metropolitan area. In white collar metropolitan areas married men have higher incomes than if they were in a blue collar SMSA. An increase in the proportion of white collar jobs in the SMSA enhances the advantage married men have over single men.
The relationship between WHI and INC is also affected by the percentage of white collar occupations in a metropolitan area. The higher the proportion of white collar jobs, the greater the impact a man's occupational status as a white or blue collar worker has on his income. The relationship between WHI and INC is positive indicating nonwhites realize higher incomes in a white collar metropolitan area than if they were in a blue collar SMSA.

All of these relationships reveal specific patterns which can be discussed in terms of typical cases. The first typical case for examining the impact the index of white collar occupations has on the determinants of income levels is for nonwhites. A married, nonwhite woman, age 27, with a high school education who works in a white collar occupation and receives $10,000 from other income sources can expect to receive $8,785 (Figure 7) in a blue collar SMSA (PWC=0.14). Her income would increase 57% to $13,785 if she were in a metropolitan area with a higher proportion of white collar workers (0.37). A man could expect only a 34% increase from $13,648 to $18,349. The result of this greater advantage for females is a shrinkage in the gender wage gap from the blue collar SMSA, $0.64, to $0.75 in the white collar metropolitan area.

An increase in OIN to $30,000 has the effect of decreasing male incomes and, thus, the gender wage gap ($0.80 in
Figure 7: White Collar Gender Wage Gaps, case 1
the blue collar and $0.90 in the white collar). These women's other sources of income are from sources besides husbands, such as welfare, AFDC, or other public assistance. It is unlikely to come from investments since these women are earning small incomes.

These women of color are working in low paying, white collar occupations. They are married but receiving little help from their husbands. The gender wage gaps are low in these SMSAS, especially if the SMSA has proportionately more white collar workers. The white collar index affects the relationships associated with the gender wage gaps. Gender wage gaps converge for these women in white collar SMSA's.

Nonwhite women employed in blue collar occupations also can expect greater conditions in white collar SMSA's. The white collar index dramatically affects the relationships between income and nonwhites. aged 37, married, with a high school education, in a blue collar occupation, and receiving $10,000 in other household income. A woman with these attributes can expect to increase her income by 46% from $7,250 to $10,491 in a white collar SMSA (Figure 8). For men, the increase is a mere 0.06% from $13,342 to $14,172.

Nonwhite, blue collar women benefit in white collar SMSA's. In a high technological white collar SMSA women of color are able to improve their income levels by working in
Figure 8: White Collar Gender Wage Gaps, case 2
blue collar occupations while a nonwhite would receive little difference across the two differing SMSA's. The gender wage gap decreases from the blue collar SMSA to the white collar SMSA ($0.53 to $0.74) because of the increase in female incomes. Women are able to find work in the white collar SMSA, whether in blue collar jobs or white collar jobs.

6.1.6 The Racial Terminal Models

The impact of the ethnic diversity of an SMSA on the effects of the individual characteristics on income is identified in this set of analyses. Due to racial variations in education attainment levels, an SMSA with a higher percentage of nonwhites is likely to be less educated. Nonwhites don't receive the same benefits for their experience and are more likely to be in a nontraditional family setting. Many nonwhite women are impoverished, single mothers with little or no financial assistance from fathers of their children. Nonwhites are also more concentrated in blue collar jobs. The effects of PNW on the varying individual independent variables are presented in the following results.

PNW affects AGE (AGE*PNW), AGE2 (AGE2*PNW) and EDU (EDU*PNW) in both equations. As AGE increases for both men and women, their income also increases. This impact is greater in SMSA's with a higher concentration of nonwhite
persons. The age-wage benefit effect is greater in non-white metropolitan areas. The age-wage penalty is greater in metropolitan areas with a higher proportion of white persons.

The other gender similarity in contextual variance is in the variable EDU*PNW; PNW affects EDU. EDU positively affects INC for both men and women, and that effect is greater in metropolitan areas with higher percentages of nonwhite persons. In SMSA's with larger numbers of persons of color the positive impact of the person's educational attainment on his/her income is greater. Educational investments pay off better where higher proportions of nonwhite persons live.

Both equations also reveal the significance of an area's ethnicity on the relationships between marital status and income. However, gender variations exist in these relationships. For men, the greater the nonwhite population, the greater the positive impact of MAD on INC. Married men realize higher incomes, especially in SMSA's with larger nonwhite populations. For females, the negative impact of MAD on INC decreases in nonwhite areas. Single females receive higher incomes and that relationship is stronger in metropolitan areas with a higher percentage of white persons.
Table 20

Expansions into % nonwhite (PNW)

<table>
<thead>
<tr>
<th></th>
<th>Female</th>
<th>Male</th>
<th>Female</th>
<th>Male</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Stepwise</td>
<td>Full</td>
<td>Stepwise</td>
<td>Full</td>
</tr>
<tr>
<td>CNST</td>
<td></td>
<td></td>
<td>-6393.089</td>
<td>-16316.118</td>
</tr>
<tr>
<td></td>
<td>(-22.251)</td>
<td>(-41.763)</td>
<td>(-21.652)</td>
<td>(-41.763)</td>
</tr>
<tr>
<td>PNW</td>
<td>-9764.262</td>
<td>-17192.041</td>
<td>-9615.223</td>
<td>-17192.041</td>
</tr>
<tr>
<td></td>
<td>(-7.404)</td>
<td>(-9.538)</td>
<td>(-7.020)</td>
<td>(-9.538)</td>
</tr>
<tr>
<td>AGE</td>
<td>447.993</td>
<td>943.760</td>
<td>448.280</td>
<td>943.760</td>
</tr>
<tr>
<td></td>
<td>(32.597)</td>
<td>(48.627)</td>
<td>(32.536)</td>
<td>(48.627)</td>
</tr>
<tr>
<td>AGE2</td>
<td>-4.672</td>
<td>-9.423</td>
<td>-4.674</td>
<td>-9.423</td>
</tr>
<tr>
<td></td>
<td>(-27.255)</td>
<td>(-39.877)</td>
<td>(-27.220)</td>
<td>(-39.877)</td>
</tr>
<tr>
<td>MAD</td>
<td>-266.215</td>
<td>2194.345</td>
<td>-250.526</td>
<td>2194.345</td>
</tr>
<tr>
<td></td>
<td>(-5.155)</td>
<td>(26.545)</td>
<td>(-4.647)</td>
<td>(26.545)</td>
</tr>
<tr>
<td>WHI</td>
<td>-179.046</td>
<td>1929.106</td>
<td>-178.049</td>
<td>1929.106</td>
</tr>
<tr>
<td></td>
<td>(-2.387)</td>
<td>(17.242)</td>
<td>(-2.373)</td>
<td>(17.242)</td>
</tr>
<tr>
<td>EDU</td>
<td>427.522</td>
<td>632.395</td>
<td>430.895</td>
<td>632.395</td>
</tr>
<tr>
<td></td>
<td>(42.842)</td>
<td>(49.985)</td>
<td>(39.417)</td>
<td>(49.985)</td>
</tr>
<tr>
<td>OIN</td>
<td>-0.020</td>
<td>-0.191</td>
<td>-0.021</td>
<td>-0.191</td>
</tr>
<tr>
<td></td>
<td>(-22.342)</td>
<td>(-71.973)</td>
<td>(-11.168)</td>
<td>(-71.973)</td>
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<tr>
<td>WHC</td>
<td>2377.747</td>
<td>2851.023</td>
<td>2341.032</td>
<td>2851.023</td>
</tr>
<tr>
<td></td>
<td>(79.022)</td>
<td>(34.122)</td>
<td>(55.966)</td>
<td>(34.122)</td>
</tr>
<tr>
<td>AGE*PNW</td>
<td>290.568</td>
<td>310.544</td>
<td>289.348</td>
<td>310.344</td>
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<tr>
<td></td>
<td>(4.483)</td>
<td>(3.373)</td>
<td>(4.449)</td>
<td>(3.373)</td>
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<tr>
<td>AGE2*PNW</td>
<td>-2.935</td>
<td>-2.358</td>
<td>-2.926</td>
<td>-2.358</td>
</tr>
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<td>(-3.619)</td>
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<tr>
<td>MAD*PNW</td>
<td>-654.581</td>
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<tr>
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<td>(2.862)</td>
<td>(-2.933)</td>
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<tr>
<td>WHI*PNW</td>
<td>2686.092</td>
<td>3885.730</td>
<td>2675.960</td>
<td>3885.730</td>
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<tr>
<td></td>
<td>(9.003)</td>
<td>(8.773)</td>
<td>(8.964)</td>
<td>(8.773)</td>
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<tr>
<td>EDU*PNW</td>
<td>375.705</td>
<td>597.082</td>
<td>358.766</td>
<td>597.082</td>
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<td></td>
<td>(8.828)</td>
<td>(10.475)</td>
<td>(7.481)</td>
<td>(10.475)</td>
</tr>
<tr>
<td>OIN*PNW</td>
<td>______</td>
<td>0.121</td>
<td>0.009</td>
<td>0.121</td>
</tr>
<tr>
<td></td>
<td>______</td>
<td>(9.956)</td>
<td>(1.009)</td>
<td>(9.956)</td>
</tr>
<tr>
<td>WHC*PNW</td>
<td>______</td>
<td>-3829.285</td>
<td>189.166</td>
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<td></td>
<td>______</td>
<td>(-9.959)</td>
<td>(0.634)</td>
<td>(-9.959)</td>
</tr>
<tr>
<td>R²</td>
<td>0.177</td>
<td>0.252</td>
<td>0.177</td>
<td>0.252</td>
</tr>
</tbody>
</table>
Estimated Expansion Equations

Female

CNST:
(1)\( a = -6423.595-9615.223 \) PNW
AGE:
(2)\( b = 448.280+289.348 \) PNW
AGE2:
(3)\( c = -4.674-2.926 \) PNW
MAD:
(4)\( d = -250.526-736.962 \) PNW
WHI:
(5)\( e = -178.049+2675.960 \) PNW
EDU:
(6)\( f = 430.895+358.766 \) PNW
OIN:
(7)\( g = -0.021+0.009 \) PNW
WHC:
(8)\( h = 2341.032+189.166 \) PNW

Male

\( a = -16316.118-17192.041 \) PNW
\( b = 943.760+310.344 \) PNW
\( c = -9.423-2.358 \) PNW
\( d = 2194.345+1096.635 \) PNW
\( e = 1929.106+3885.730 \) PNW
\( f = 632.395+597.082 \) PNW
\( g = -0.191+0.121 \) PNW
\( h = 2851.023-3829.285 \) PNW

In metropolitan areas with higher percentages of nonwhite persons, the experiences of married men are quite different from those of married women. Married men find their marital status positively affecting their income to a greater extent than if they were in a metropolitan area with proportionately more white persons. On the other hand, married women find their marital status accompanying a decrease in their income, but to a lesser degree. If a woman were in a white SMSA she would find her singlehood increasing her income to a greater extent than if she were in an SMSA with more nonwhite persons. Married men receive more money in nonwhite areas and single women receive more money in white areas. An increase in the proportion of nonwhites in an area results in an increase in the positive impact MAD has on a man's income. However, an increase in
the percentage of white persons affects the woman by increasing her wages if she is single.

The impact WHI has on INC is affected by the proportion of nonwhite persons in the metropolitan area. A white man finds his race positively impacting on his income and that impact increases in SMSA's with more nonwhite persons. White men realize higher incomes and this relationship is strengthened in areas with more nonwhite persons. Nonwhite men receive higher incomes if fewer people of color are in the metropolitan area. The fewer the number of nonwhite persons, the higher the nonwhite man's income. For women, WHI is negatively related to INC and that relationship is stronger in metropolitan areas with more nonwhite persons. A nonwhite woman can expect higher incomes especially in metropolitan areas with more people of color.

White collar occupations positively affect per capita income for both males and females. For men, an increase in the percentage of nonwhite persons lessens the effect of WHC on INC, whereas for women it strengthens the effect. In a nonwhite metropolitan area a man in a white collar occupation receives a lower income than if he were in a white SMSA. White metropolitan areas allow for greater incomes for men who are white collar workers. Conversely, nonwhite SMSA's permit higher incomes for female white collar workers.
As other household income increases, the individual's income decreases for both men and women. The ethnicity of the environment affects this relationship for men, but has no significant effect for women. As the percentage of the nonwhite population increases, the effect of OIN on INC increases. A man with increasing sources of other household income has decreasing per capita income and this is stronger in metropolitan areas with proportionately more nonwhite persons.

Some specific examples illustrate the relationships involved in the ethnic metropolitan areas. Assume a typical case of a 37-year-old, single, nonwhite woman with a high school education, employed in a white collar job, and with $10,000 in other sources of income. In an SMSA with a high percentage (65%) of nonwhite persons she can expect to earn $12,055 which is better than the $11,169 she can expect to earn in a predominantly (95%) white metropolitan area. Her opportunities for a higher income are greater in a nonwhite metropolitan area.

A nonwhite male with the same characteristics can expect to fare better in a white SMSA. The $14,013 is far better than the $11,378 he can expect to earn in a nonwhite SMSA. His advantage is in the white metropolitan area. In the nonwhite metropolitan area nonwhite women are the ones benefiting from the nontraditional environment. The gender
wage gap is actually in this woman's favor. The man in this typical case earns $.94 on the female dollar in a non-white SMSA, whereas in the white metropolitan area the woman earns $.80 on the male dollar (Figure 9).
Figure 9: Racial Gender Wage Gaps
6.1.7 The Per Capita Income Terminal Models

The per capita income of the metropolitan area affects the relationships between the individual's characteristics and his/her income. Wealthy SMSA's have more persons who have attained the top paying managerial occupations. People are reaping the benefits of their experience and educational investments. Wealthy areas are more likely to be white while less likely to have impoverished single females who are solely responsible for their children.

These analyses reveal the effects PCI has on the variables and their relationships with income. AGE*PCI reveals the effect of PCI on AGE. The effect of AGE on INC is affected by the overall per capita income for the SMSA. For both men and women the age-wage benefit is affected by the wealth of the metropolitan area. The higher the per capita income in a metropolitan area, the greater the age-wage benefit. The age-wage penalty is also affected by the per capita income of the metropolitan areas for both males and females. The age-wage penalty is greater in poorer metropolitan areas.

The relationship between WHI and INC is positive for both men and women. A white person makes more money than a nonwhite person. For women, this effect of ethnicity on income is stronger in metropolitan areas with lower per capita incomes. The reverse is true for men. In metropol-
### Table 21

Expansions into per capita income (PCI)

<table>
<thead>
<tr>
<th></th>
<th>Female</th>
<th>Male</th>
<th>Female</th>
<th>Male</th>
</tr>
</thead>
<tbody>
<tr>
<td>CNST</td>
<td>-1472.581</td>
<td>-18564.170</td>
<td>-3832.748</td>
<td>-19110.448</td>
</tr>
<tr>
<td>PCI</td>
<td>-0.818</td>
<td>------</td>
<td>-0.521</td>
<td>0.069</td>
</tr>
<tr>
<td>AGE</td>
<td>------</td>
<td>707.925</td>
<td>126.628</td>
<td>743.276</td>
</tr>
<tr>
<td>AGE2</td>
<td>------</td>
<td>-7.566</td>
<td>-1.454</td>
<td>-7.993</td>
</tr>
<tr>
<td>MAD</td>
<td>------</td>
<td>------</td>
<td>-302.947</td>
<td>-135.252</td>
</tr>
<tr>
<td>WHI</td>
<td>905.850</td>
<td>------</td>
<td>944.811</td>
<td>430.433</td>
</tr>
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<td>EDU</td>
<td>------</td>
<td>702.255</td>
<td>252.206</td>
<td>675.070</td>
</tr>
<tr>
<td>OIN</td>
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<td>0.038</td>
<td>-0.054</td>
</tr>
<tr>
<td>WHC</td>
<td>1119.644</td>
<td>-1832.826</td>
<td>1053.362</td>
<td>-1771.502</td>
</tr>
<tr>
<td>AGE·PCI</td>
<td>0.064</td>
<td>0.035</td>
<td>0.048</td>
<td>0.050</td>
</tr>
<tr>
<td>AGE2·PCI</td>
<td>-0.000</td>
<td>-0.000</td>
<td>-0.000</td>
<td>-0.000</td>
</tr>
<tr>
<td>MAD·PCI</td>
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<td>0.324</td>
<td>0.001</td>
<td>0.341</td>
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<tr>
<td>WHI·PCI</td>
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<td>0.352</td>
<td>-0.078</td>
<td>0.298</td>
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<tr>
<td>EDU·PCI</td>
<td>0.029</td>
<td>------</td>
<td>0.029</td>
<td>0.003</td>
</tr>
<tr>
<td>OIN·PCI</td>
<td>-0.000</td>
<td>-0.000</td>
<td>-0.000</td>
<td>-0.000</td>
</tr>
<tr>
<td>WHC·PCI</td>
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<td>0.506</td>
<td>0.171</td>
<td>0.498</td>
</tr>
<tr>
<td>R²</td>
<td>0.190</td>
<td>0.267</td>
<td>0.190</td>
<td>0.267</td>
</tr>
</tbody>
</table>
Estimated Expansion Equations

<table>
<thead>
<tr>
<th></th>
<th>Female</th>
<th>Male</th>
</tr>
</thead>
<tbody>
<tr>
<td>CNST:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(1) $a = -3832.748 - 0.521$ PCI $a = -26106.947 + 488.439$ PCI</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AGE:</td>
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<td></td>
</tr>
<tr>
<td>(2) $b = 126.628 + 0.048$ PCI $b = 1249.405 - 18.554$ PCI</td>
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<td></td>
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<tr>
<td>AGE2:</td>
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<td></td>
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<td>(3) $c = -1.454 - 0.000$ PCI $c = -13.184 + 0.243$ PCI</td>
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<td></td>
</tr>
<tr>
<td>MAD:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(4) $d = -302.947 + 0.001$ PCI $d = -630.979 + 223.719$ PCI</td>
<td></td>
<td></td>
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<tr>
<td>WHI:</td>
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<td>(5) $e = 944.811 - 0.078$ PCI $e = -1142.777 + 280.661$ PCI</td>
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<td></td>
</tr>
<tr>
<td>EDU:</td>
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<td></td>
</tr>
<tr>
<td>(6) $f = 252.206 - 0.029$ PCI $f = 613.899 + 8.627$ PCI</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OIN:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(7) $g = 0.038 - 0.000$ PCI $g = -0.143 - 0.002$ PCI</td>
<td></td>
<td></td>
</tr>
<tr>
<td>WHC:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(8) $h = 1053.362 + 0.171$ PCI $h = -3418.929 + 395.420$ PCI</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In metropolitan areas with higher per capita incomes, the effect is greater. An increase in the per capita income for an SMSA decreases the effect that ethnicity has on a woman's income while it increases for men.

OIN relates positively to the dependent variable for women and negatively to income for men. As other household income increases, so does the woman's income. This relationship is affected by the overall income of the SMSA. In poorer metropolitan areas, the positive relationship between OIN and INC is stronger for women. Males also experience a stronger relationship between OIN and INC in poorer SMSA's. However, that relationship between OIN and INC is negative. Therefore, in poorer metropolitan areas, an increase in a person's income accompanies an increase in other household income for women and a decrease in other household income for men.
EDU*PCI, which identifies PCI's effect on EDU, relates positively to INC in both models. All people experience a stronger impact of their educational attainment on their income in areas with higher per capita income levels. The overall wealth of the population in the environment affects the degree to which a person's education impacts on his/her income. Higher educational attainments accompany greater incomes for both males and females. In wealthy SMSA's educational credentials result in better payoffs for men and women.

The impact of a white collar occupation on the person's income is greater in SMSA's with higher per capita incomes. For women, a white collar job accompanies higher income levels, and for men, a blue collar job. In wealthy SMSA's, those relationships are stronger. White collar women and blue collar men receive higher wages if the overall population in the SMSA is wealthier. Both single men and single women receive higher incomes than their married counterparts.

Representing the impact of PCI on MAD, MAD*PCI relates negatively to INC in the female model but relates positively in the male equation. Single women receive higher incomes and this relationship is stronger in areas with smaller per capita income levels. In poorer metropolitan areas the effect that the single woman's marital status has
on her income is greater than if she were in an SMSA with greater wealth. In richer SMSA's the single woman has less of an advantage. Single men enjoy higher incomes and this relationship is stronger in SMSA's with greater wealth. In wealthy metropolitan areas single men have the greater advantage while single women have the advantage in poorer SMSA's.

A typical case reveals the relationships involved in these analyses. A sixty-year-old, married, white woman with a college education, working in a white collar occupation and receiving $10,000 in other household income, can expect to earn $.97 on the male dollar in a rich SMSA with a per capita income on $13,000. This woman's experience and education has paid off with a $46,907 income and a man with the same characteristics can expect slightly more, $46,203.

In a poorer SMSA with a per capita income of $6,000 the woman can expect to earn much less, $22,141 and the gender wage gap is wider. The man earns $25,229 which is an $.88 gender wage gap (Figure 10). In areas with lower incomes, older, well-established women are at a greater disadvantage. In the rich areas both genders do well, but in the poorer areas the older, well-established man has the distinct advantage over his female counterpart.
$50,000
$48,000
$46,000
$44,000
$42,000
$40,000
$38,000
$36,000
$34,000
$32,000
$30,000
$28,000
$26,000
$24,000
$22,000
$20,000
$18,000
$16,000
$14,000
$12,000
$10,000
$8,000
$6,000
$4,000
$2,000

Expected Income
(\text{where} \ \text{AGE}=60 \ \text{MAD}=1 \ \text{WHI}=1 \ \text{EDU}=16 \ \text{WHC}=1 \ \text{OIN}=10,000)

Figure 10: Per Capita Income Gender Wage Gaps
6.1.8 The Fertility Terminal Models

Fertility rates in a metropolitan area affect the relationships between an individual's characteristics and his/her income. SMSA's with higher fertility rates are those with more traditional family lifestyles. They are married couples who have larger families rather than an area with more single persons, childless couples, and younger persons who haven't yet begun their childbearing. A higher number of alternative lifestyles are found in these nontraditional SMSA's. The lower fertility rate areas are those that don't follow the norms. Populations in areas with higher fertility rates also are less educated and concentrated in blue collar manufacturing jobs. The women are less mobile and flexible because they assume the greater share of the responsibilities associated with childrearing. Theirs is also the secondary income in the family indicating less flexibility.

Both models reveal the effect NCF has on WHC (WHC*NCF). For both men and women, as the number of children per female decreases in a metropolitan area, the positive impact of WHC on INC is strengthened. The lower the fertility in the area, the greater the income for a person in a white collar job. Raising the fertility rate in an SMSA decreases the impact WHC has on INC. White collar employment results in higher wages and this relationship is
affected by the fertility rates in the area. In areas with low fertility rates a white collar job receives higher pay.

The negative impact OIN has on INC is stronger in SMSA's with a higher number of children per female. As other household income increases, the individual's income decreases and this relationship is strengthened by an increase in fertility. In high fertility areas where women are less likely to be in a ladder-climbing career, the negative relationship between other income and income is stronger.

For men, the positive impact of MAD on INC is greater in metropolitan areas with lower numbers of children per female. This is a significant relationship for men only. As a man is more likely to be married, his income is more likely to be higher especially in SMSA's with lower numbers of children per female. In low fertility areas with more nontraditional family groups a man benefits more if he is married. If he is in a high fertility area with traditional lifestyles he has less of an income advantage.

The female experience is totally different. MAD has a negative impact on INC indicating single women receive higher incomes. NCF does not significantly affect this relationship. In both high and low fertility SMSA's single women enjoy this advantage.
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The positive effect of EDU on INC exists for both men and women. However, the fertility rates in the environment do not affect the relationship for either gender. Higher educational attainment translates into higher income levels, but the fertility rate does not significantly affect the relationship.

The female model demonstrates a significant positive relationship between WHI*NCF and INC indicating the effect of NCF on WHI. The negative relationship between WHI and INC is affected by context. The greater number of children per female in an SMSA, the greater the negative impact of WHI on INC. The more likely a woman is nonwhite, the more likely she'll have a higher income in metropolitan areas with higher fertility rates. In high fertility rate areas where traditional family organizations prevail, the non-
white woman has her greater advantage. In nontraditional SMSA's with more single, career-oriented white collar women the advantage of the women of color is diminished. For men, WHI positively relates to INC but does not significantly vary according to the fertility rate in the area. White men receive higher incomes everywhere.

A person's age relates to income similarly for both men and women. The age-wage benefit occurs for both sexes as does the age-wage penalty. Fertility rates in a given SMSA affect the age-wage benefit for women but not men. A female in a low fertility SMSA receives a higher age-wage benefit. However, her age-wage penalty is greater in the more traditional SMSA that has higher fertility rates. In this SMSA she is more likely to have interrupted her career to raise her children, and, therefore, receives a greater age-wage penalty. For men, the age-wage penalty also is affected by fertility rates in the given SMSA. However, males receive a higher age-wage penalty in a metropolitan area with lower fertility rates. The older men are being replaced by the ladder-climbing younger people and single persons found in SMSA's with low fertility rates.

The typical case in this analysis reveals a large difference in gender wage gaps in the two extremes. The estimated income for a woman aged 37, married, nonwhite, with a high school education, employed in a blue collar occupation
and with $10,000 in other sources of income is $10,809 in an SMSA with low fertility (0.75 children born per female). A man with identical characteristics can expect to earn $13,908 resulting in a gender wage gap of $.78:

The gender wage gap widens dramatically in a metropolitan area with higher fertility rates (1.75 children born per female). The man's income decreases slightly to $13,451. However, the woman's income drops to $6,530 creating a $.49 gender wage gap (Figure 11). As fertility increases, the married, nonwhite woman has a dramatically lower income so that she earns less than half of what a man with the same characteristics earns.
Figure 11: Fertility Gender Wage Gaps
6.1.9 The Single Female Parent Household Terminal Models

Metropolitan areas with more single female householders are nontraditional SMSA's. These women are not wealthy because they are the sole support of their families. They lack the occupational mobility of others. These women are financially disadvantaged because they lack educational credentials and job experience required to obtain higher paying jobs. The effect that this proportion of single mothers has on the individual's characteristics and his/her income is presented in these analyses.

A person's income level is negatively related to other household income. As OIN increases, INC decreases for both men and women. This relationship is strengthened by an increase in the percentage of single female householders in the SMSA. Similarly, as WHI increases, INC decreases for both sexes. That relationship is also enhanced in metropolitan areas with more single female households. In areas with more single female-headed households, an increase in WHI or OIN results in a decrease in income. People with more other sources of income or those who are white are more likely to receive lower wages especially in metropolitan areas where more households are headed by single females.

The relationship between WHC and INC is positive for both males and females. A white collar job increases a
Table 23

Expansions into single female householders (SHF)

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Estimated Expansion Equations

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<td>( a = 7493.061 - 33779.551 ) SHF</td>
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<td>( c = -12.588 + 9.096 ) SHF</td>
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<td>(2) ( d = 1001.515 - 1760.254 ) SHF</td>
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<td>( e = -4270.906 + 5502.493 ) SHF</td>
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<td>( f = -37.417 + 671.918 ) SHF</td>
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<td>( g = -0.132 + 0.140 ) SHF</td>
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<td>(3) ( h = 6519.154 - 5106.704 ) SHF</td>
<td>( h = 6555.502 - 5484.447 ) SHF</td>
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The age-wage benefit and penalty are present and significant for both men and women. For women, both the benefit and penalty are affected by the percentage of single female householders in the SMSA. The age-wage benefit is greater in SMSA's with fewer single female householders. The effect of job experience is greater where more women are in
traditional married-couple family settings. However, the age-wage penalty is higher in SMSA's with more single female-headed households. This reflects the decreased incomes of displaced homemakers and divorced and widowed women. The age-wage penalty is also higher for men in those SMSA's. However, the age-wage benefit for men is not significantly affected by SHF.

For men, the positive relationship between MAD and INC is affected by SHF. A married man receives higher wages especially in metropolitan areas with fewer single households headed by women. The higher the proportion of single female headed households, the lesser the impact his marital status has on his income. For women, the relationship between MAD and INC is not significantly affected by SHF.

With respect to EDU, the relationship between EDU and INC is not significant for either sex.

The significant relationships result in some gender wage gaps for specific cases. A typical case of a 37-year-old, single, nonwhite woman with a high school education, working in a white collar job and receiving $10,000 in other household income is discussed in these analyses. This woman can expect to earn $13,721 in an SMSA with fewer female-headed households (70%). A similar man can expect $16,474 in income which is an $.83 gender wage gap.
Both men and women earn less if the SMSA has a high proportion of women heading households (87%). In these SMSA's the income of the woman in the typical case example decreases to $10,203 and the man's to $11,612. Because the man's drops further, the wage gap is diminished to $.88 (Figure 12).
Expected Income
(where AGE=37
MAD=0
WHI=0
EDU=12
WHC=1
OIN=10,000)

$50,000
$48,000
$46,000
$44,000
$42,000
$40,000
$38,000
$36,000
$34,000
$32,000
$30,000
$28,000
$26,000
$24,000
$22,000
$20,000
$18,000
$16,000
$14,000
$12,000
$10,000
$8,000
$6,000
$4,000
$2,000

Single Person Households Headed by a Female

Figure 12: Single Female Parent Household Gender Wage Gaps
6.1.10 The Manufacturing Terminal Models

Metropolitan areas which employ many people in manufacturing jobs are more traditional ones. The people are blue collar workers and usually male. They have a wife who either does not work outside the home or is in a low paying job which is secondary to the man's work. They have children and usually have not obtained high educational credentials. It is a traditional environment. The effects of this environment on an individual's characteristics and his/her income is examined in these analyses.

Ethnicity is discussed first. The lower the percentage of manufacturing occupations in an SMSA, the greater the positive effect of WHI on INC. White persons receive higher incomes, especially in metropolitan areas with fewer persons employed in manufacturing occupations. This is true for both men and women.

The age-wage benefit and age-wage penalty occur for both sexes. The effect of PEM on both the benefit and the penalty is similar for males and females. The benefit of experience and training is rewarded more in an SMSA with fewer people employed in manufacturing industries. Those benefits of age are associated with different industries such as professional, managerial, and service. The age-wage penalty is greater in metropolitan areas with more manufacturing jobs. The manufacturing sector does not reward aging workers.
### Table 24

Expansions into % employed in manufacturing (PEM)

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<td>(-0.116)</td>
<td></td>
</tr>
<tr>
<td>WHI*PEM</td>
<td>-1231.784</td>
<td>-1562.462</td>
<td>-1216.819</td>
<td>-1557.315</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(-3.146)</td>
<td>(-2.628)</td>
<td>(-3.104)</td>
<td>(-2.613)</td>
<td></td>
</tr>
<tr>
<td>EDU*PEM</td>
<td>-304.577</td>
<td>-577.966</td>
<td>-307.000</td>
<td>-570.470</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(-4.905)</td>
<td>(-7.945)</td>
<td>(-4.937)</td>
<td>(-7.813)</td>
<td></td>
</tr>
<tr>
<td>OIN*PEM</td>
<td>-0.023</td>
<td>-0.021</td>
<td>-0.021</td>
<td>-0.019</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(-2.188)</td>
<td>(-1.845)</td>
<td>(-1.217)</td>
<td>(-1.217)</td>
<td></td>
</tr>
<tr>
<td>WHC*PEM</td>
<td>-1171.035</td>
<td>4603.500</td>
<td>-1170.094</td>
<td>4585.490</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(-3.017)</td>
<td>(9.022)</td>
<td>(-3.015)</td>
<td>(8.980)</td>
<td></td>
</tr>
<tr>
<td>R²</td>
<td>0.172</td>
<td>0.253</td>
<td>0.172</td>
<td>0.253</td>
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</tr>
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</table>
Estimated Expansion Equations

**Female**

<table>
<thead>
<tr>
<th>Equation</th>
<th>Female</th>
<th>Male</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) CNST:</td>
<td>$a = -11192.346 + 13309.739 \text{ PEM}$</td>
<td>$a = -26130.260 + 30405.060 \text{ PEM}$</td>
</tr>
<tr>
<td>(2) AGE:</td>
<td>$b = 562.823 - 264.884 \text{ PEM}$</td>
<td>$b = 1133.670 - 616.293 \text{ PEM}$</td>
</tr>
<tr>
<td>(3) AGE2:</td>
<td>$c = -5.772 + 2.409 \text{ PEM}$</td>
<td>$c = -10.946 + 5.098 \text{ PEM}$</td>
</tr>
<tr>
<td>(4) MAD:</td>
<td>$d = -368.851 - 229.901 \text{ PEM}$</td>
<td>$d = 2368.264 - 57.175 \text{ PEM}$</td>
</tr>
<tr>
<td>(5) WHI:</td>
<td>$e = 420.050 - 1216.819 \text{ PEM}$</td>
<td>$e = 2769.934 - 1557.315 \text{ PEM}$</td>
</tr>
<tr>
<td>(6) EDU:</td>
<td>$f = 573.245 - 307.000 \text{ PEM}$</td>
<td>$f = 878.133 - 570.470 \text{ PEM}$</td>
</tr>
<tr>
<td>(7) OIN:</td>
<td>$g = -0.014 - 0.021 \text{ PEM}$</td>
<td>$g = -0.019 - 0.019 \text{ PEM}$</td>
</tr>
<tr>
<td>(8) WHC:</td>
<td>$h = 2655.883 - 1170.094 \text{ PEM}$</td>
<td>$h = 1263.333 + 4585.490 \text{ PEM}$</td>
</tr>
</tbody>
</table>

MAD relates negatively to income for women indicating single women have higher incomes. However, for men, the opposite is true. Married men earn higher wages than single men. The percentage of persons employed in manufacturing industries in the metropolitan area does not significantly affect these relationships between marital status and income.

The relationship between OIN and INC is negative for both males and females. As a person's income increases his/her sources of other household income decrease. For men, the percentage of persons employed in manufacturing jobs has no significant effect on OIN. However, for women, as PEM decreases, the negative impact of OIN on INC is greater. In areas with fewer manufacturing industries women who have high levels of income from other sources have lower individual incomes.
Gender variations are revealed in the effect PEM has on WHC. WHC relates positively to INC in both models. White collar occupations are higher paying. The greater the percentage of manufacturing jobs, the greater the positive effect a white collar occupation has on a man's income. If the SMSA has proportionately more manufacturing jobs, a white collar job will have a greater impact on an increase in a man's income. For women, white collar jobs have a positive impact on their income, but this relationship is stronger in metropolitan areas with fewer manufacturing occupations. Fewer white collar jobs are located in the manufacturing SMSA's, and men are the ones receiving those higher paying jobs.

In both models EDU*PEM reveals the effect of PEM on EDU is negative. This indicates a strengthening of the effect EDU has on INC in metropolitan areas with fewer people in manufacturing jobs. The relationship between EDU and INC is positive for both males and females. In metropolitan areas with fewer manufacturing jobs, that positive impact is strengthened.

The typical case identifies a 60-year-old, married, white woman with a college education, in a white collar occupation and with $10,000 in other sources of income. She can expect to earn $13,436 in an SMSA with few people (PEM=0.05) employed in manufacturing jobs. If she were in
an SMSA with more (PEM=0.50) people employed in manufacturing occupations, she could expect to earn $12,751. A man could expect to earn $21,591 in the first metropolitan area creating a gender wage gap of $0.62. The gender wage gap in the SMSA with more people working in the manufacturing sector where the man can expect to earn $24,006 is $0.53 (Figure 13).

The gender wage gap widens as the woman's income decreases in metropolitan areas with more manufacturing industry jobs, while the male's income increases. The older, married, white, college-educated woman receives low wages in white collar jobs in both metropolitan areas. A man with the same characteristics has higher wages and they increase in the manufacturing SMSA.
Expected Income

(where
AGE=60
MAD=1
WHI=1
EDU=16
WHC=1
OIN=10,000)

Male

Female

Figure 13: Manufacturing Gender Wage Gaps
6.1.11 The Feminized Paid Labor Force Models

SMSA's with more of the paid labor force composed of women are more progressive metropolitan areas. These areas have fewer traditional family lifestyles where the husband works outside the home and the wife stays home to manage the household, bear the children, and raise them. SMSA's with more women in the paid labor force are home to more dual career families, single mothers, career women, househusbands, and trailing spouses who are male.

AGE relates negatively to INC for both men and women indicating the age-wage benefit is not present. AGE2 relates positively to INC for women revealing the absence of the age-wage penalty. For men, the age-wage penalty effect is not significant. The effect of WLF on the relationships between age and income is similar for both men and women. The effect of AGE on INC increases in SMSA's with more women in the paid labor force. Experience does not pay off for women especially in metropolitan areas with more women entering the paid labor force. The entry of women into the paid labor force has been recent, and women who are older with more experience are not reaping the benefits of the new changes that are occurring in the paid labor force. When they began that career, they did not necessarily pursue occupations that would pay for their experience. Where the oldest women are benefitting is in
Table 25
Expansions into % feminized paid labor force (WLF)

<table>
<thead>
<tr>
<th></th>
<th>Female</th>
<th>Male</th>
<th>Female</th>
<th>Male</th>
</tr>
</thead>
<tbody>
<tr>
<td>CNST</td>
<td>16733.239</td>
<td>47722.923</td>
<td>15628.398</td>
<td>48115.635</td>
</tr>
<tr>
<td></td>
<td>(5.643)</td>
<td>(20.286)</td>
<td>(4.426)</td>
<td>(10.618)</td>
</tr>
<tr>
<td>WLF</td>
<td>-57915.866</td>
<td>-15614.76</td>
<td>-55379.377</td>
<td>-157000.46</td>
</tr>
<tr>
<td></td>
<td>(-8.448)</td>
<td>(-28.650)</td>
<td>(-6.797)</td>
<td>(-14.976)</td>
</tr>
<tr>
<td>AGE</td>
<td>-480.687</td>
<td>-163.627</td>
<td>-570.947</td>
<td>-99.262</td>
</tr>
<tr>
<td></td>
<td>(-2.967)</td>
<td>(-5.139)</td>
<td>(-3.399)</td>
<td>(-0.426)</td>
</tr>
<tr>
<td>AGE2</td>
<td>4.909</td>
<td>------</td>
<td>6.007</td>
<td>-0.808</td>
</tr>
<tr>
<td></td>
<td>(2.417)</td>
<td>(2.858)</td>
<td>(-0.283)</td>
<td></td>
</tr>
<tr>
<td>MAD</td>
<td>------</td>
<td>2309.606</td>
<td>1572.190</td>
<td>1970.073</td>
</tr>
<tr>
<td></td>
<td>(60.048)</td>
<td>(2.404)</td>
<td>(1.989)</td>
<td></td>
</tr>
<tr>
<td>WHI</td>
<td>213.892</td>
<td>2482.768</td>
<td>925.934</td>
<td>2290.646</td>
</tr>
<tr>
<td></td>
<td>(7.074)</td>
<td>(54.535)</td>
<td>(1.199)</td>
<td>(2.023)</td>
</tr>
<tr>
<td>EDU</td>
<td>------</td>
<td>-947.417</td>
<td>135.655</td>
<td>-1054.794</td>
</tr>
<tr>
<td></td>
<td>(-7.611)</td>
<td>(1.067)</td>
<td>(-7.298)</td>
<td></td>
</tr>
<tr>
<td>OIN</td>
<td>------</td>
<td>-0.513</td>
<td>-0.050</td>
<td>-0.511</td>
</tr>
<tr>
<td></td>
<td>(-16.559)</td>
<td>(-2.191)</td>
<td>(-16.231)</td>
<td></td>
</tr>
<tr>
<td>WHC</td>
<td>------</td>
<td>2229.703</td>
<td>261.404</td>
<td>3811.682</td>
</tr>
<tr>
<td></td>
<td>(56.271)</td>
<td>(0.358)</td>
<td>(3.812)</td>
<td></td>
</tr>
<tr>
<td>AGE*WLF</td>
<td>2282.019</td>
<td>2710.654</td>
<td>2490.112</td>
<td>2561.082</td>
</tr>
<tr>
<td></td>
<td>(6.097)</td>
<td>(35.388)</td>
<td>(6.416)</td>
<td>(4.745)</td>
</tr>
<tr>
<td></td>
<td>(-5.013)</td>
<td>(-8.790)</td>
<td>(-5.366)</td>
<td>(-3.191)</td>
</tr>
<tr>
<td>MAD*WLF</td>
<td>-965.038</td>
<td>------</td>
<td>-4593.233</td>
<td>766.239</td>
</tr>
<tr>
<td></td>
<td>(-16.624)</td>
<td>(3.042)</td>
<td>(0.343)</td>
<td></td>
</tr>
<tr>
<td>WHI*WLF</td>
<td>------</td>
<td>------</td>
<td>-1635.657</td>
<td>443.757</td>
</tr>
<tr>
<td></td>
<td>(0.222)</td>
<td>(0.170)</td>
<td>(10.966)</td>
<td></td>
</tr>
<tr>
<td>EDU*WLF</td>
<td>1161.813</td>
<td>3937.310</td>
<td>849.555</td>
<td>4185.531</td>
</tr>
<tr>
<td></td>
<td>(105.078)</td>
<td>(13.662)</td>
<td>(2.928)</td>
<td>(12.526)</td>
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<td>OIN*WLF</td>
<td>-0.042</td>
<td>0.803</td>
<td>0.072</td>
<td>0.798</td>
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<tr>
<td></td>
<td>(-20.725)</td>
<td>(11.211)</td>
<td>(1.388)</td>
<td>(10.966)</td>
</tr>
<tr>
<td>WHC*WLF</td>
<td>5523.048</td>
<td>------</td>
<td>4918.625</td>
<td>-3655.319</td>
</tr>
<tr>
<td></td>
<td>(79.556)</td>
<td>(1.758)</td>
<td>(-1.583)</td>
<td></td>
</tr>
<tr>
<td>R2</td>
<td>0.173</td>
<td>0.252</td>
<td>0.173</td>
<td>0.252</td>
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Estimated Expansion Equations

<table>
<thead>
<tr>
<th></th>
<th>Female</th>
<th>Male</th>
</tr>
</thead>
<tbody>
<tr>
<td>CNST:</td>
<td>a = 15628.398-55379.377 WLF</td>
<td>a = 48115.635-157000.46 WLF</td>
</tr>
<tr>
<td>AGE:</td>
<td>b = -570.947+20.111 WLF</td>
<td>b = -99.262+2561.082 WLF</td>
</tr>
<tr>
<td>AGE2:</td>
<td>c = 6.007-0.199 WLF</td>
<td>c = -0.808-21.070 WLF</td>
</tr>
<tr>
<td>MAD:</td>
<td>d = 1572.190-8.922 WLF</td>
<td>d = 1970.073+786.239 WLF</td>
</tr>
<tr>
<td>WHI:</td>
<td>e = 925.934-36.652 WLF</td>
<td>e = 2290.646+443.757 WLF</td>
</tr>
<tr>
<td>EDU:</td>
<td>f = 15.313+849.555 WLF</td>
<td>f = -1054.794+4185.531 WLF</td>
</tr>
<tr>
<td>OIN:</td>
<td>g = 0.031+0.072 WLF</td>
<td>g = -0.511+0.798 WLF</td>
</tr>
<tr>
<td>WHC:</td>
<td>h = 68.214+4918.625 WLF</td>
<td>h = 3811.682-3655.319 WLF</td>
</tr>
</tbody>
</table>

the SMSA's with fewer women in the paid labor force. Their wages are highest in those metropolitan areas.

The impact a person's educational attainment level has on his/her income is affected by the degree of feminization of the paid labor force. In SMSA's with more of its paid labor force composed of women, the effect education has on a person's income is greater. For men, that effect is negative. Higher educational attainment for men accompanies lower income levels especially in metropolitan areas with a highly feminized paid labor force. For women, EDU impacts positively on INC, but the effect is not significant.

The relationship between OIN and INC is negative for both men and women but significant only for men. As sources of other household income increase, the person's individual income decreases. For men, this effect that OIN has
on INC is stronger in SMSA's with a higher feminized paid labor force. The fewer numbers of female workers, the smaller the impact. For women, the effect OIN has on INC is weaker in metropolitan areas with a highly feminized paid labor force.

Another gender variation is revealed in the WHC*WLF variable. In the male model WHC relates positively to INC revealing a white collar job means higher wages for men and this relationship is not affected by the percentage of women in the paid labor force. However, for women, it is positively affected by WLF. With an increasing amount of the paid labor force which is female, the greater the impact WHC has on women's incomes. For women, the relationship between WHC and INC is positive but not significant.

The relationship between MAD and INC is positive for both men and women but significant only in the male model. Married people earn more than single persons. The percentage of women in the paid labor force affects MAD in the female model. The smaller the proportion of the paid labor force which is female, the greater the impact of MAD on INC. For men, WLF does not significantly affect the relationship between MAD and INC.

Both models reveal a positive relationship between WHI and INC. A white person receives higher wages than a non-
white person. However, the impact that race has on income is not significantly affected by the degree of feminization of the paid labor force in the SMSA.

The typical case is for a white woman who is 37, married, college educated, in a white collar job, and receiving $10,000 in other sources of income. In an SMSA with a paid labor force which is composed of fewer women (WLF=0.36) she can expect to earn $12,022. A man with the same characteristics can expect to earn almost twice as much, $22,568. This gender wage gap is $0.53. In an SMSA with a larger feminized paid labor force (WLF=0.48) the woman's estimated income increases to $14,069, but the man's decreases to $20,624. The gender wage gap shrinks to $0.68 and it still wide (Figure 14).

This woman earns more and the man earns less as the percent of the paid labor force, which is women, increases.
Expected Income

(\text{where}
\begin{align*}
\text{AGE} &= 37 \\
\text{MAD} &= 1 \\
\text{WHI} &= 1 \\
\text{EDU} &= 16 \\
\text{WHC} &= 1 \\
\text{OIN} &= 10,000
\end{align*})

\begin{align*}
&\$50,000 \\
&\$48,000 \\
&\$46,000 \\
&\$44,000 \\
&\$42,000 \\
&\$40,000 \\
&\$38,000 \\
&\$36,000 \\
&\$34,000 \\
&\$32,000 \\
&\$30,000 \\
&\$28,000 \\
&\$26,000 \\
&\$24,000 \\
&\$22,000 \\
&\$20,000 \\
&\$18,000 \\
&\$16,000 \\
&\$14,000 \\
&\$12,000 \\
&\$10,000 \\
&\$8,000 \\
&\$6,000 \\
&\$4,000 \\
&\$2,000 \\
&\$0
\end{align*}

Percent of Labor Force which is Female

\text{Male}

\text{Female}

Figure 14: Feminized Paid Labor Force Gender Wage Gaps
6.1.12  The Models with All Expansions

The final models include all of the environmental variables. Table 26 is the final model for women and Table 27 is the final male model. The models reveal the effects different contexts have on the individual's incomes for both men and women. Therefore, gender wage gaps are identified.

Table 26

All Expansions, Female Model

Terminal Model
$R^2 = 0.196$

INC = $-3218.744 - 53.649$ MAD\textsuperscript{POP} + $14.464$ EDU\textsuperscript{POP}
\[(-7.419)\quad (-4.527)\quad (13.441)\]

\[+ 0.028\quad OIN\quad + 6985.371\quad WHC\quad + 107.143\quad WHC\textsuperscript{POP}\]
\[4.237\quad (5.509)\quad (3.830)\]

\[+ 0.040\quad AGE\textsuperscript{PCI}\quad - 4.902\quad E-5\quad AGE\textsuperscript{2}\textsuperscript{PCI}\quad - 7.54\quad E-6\quad OIN\textsuperscript{PCI}\]
\[23.492\quad (-15.731)\quad (-9.158)\]

\[+ 752.299\quad MAD\textsuperscript{HSG}\quad - 4741.160\quad WHC\textsuperscript{HSG}\quad + 120.895\quad EDU\textsuperscript{PNW}\]
\[3.135\quad (-7.562)\quad (5.641)\]

\[+ 0.029\quad OIN\textsuperscript{PNW}\quad - 1471.111\quad WHC\textsuperscript{PNW}\quad - 25392.898\quad PWC\]
\[3.521\quad (-4.159)\quad (-15.804)\]

\[+ 755.179\quad AGE\textsuperscript{PWC}\quad - 5.487\quad AGE\textsuperscript{2}\textsuperscript{PWC}\quad + 576.890\quad EDU\textsuperscript{PWC}\]
\[12.482\quad (-5.221)\quad (5.860)\]

\[+ 12769.189\quad WHC\textsuperscript{PWC}\quad + 6767.972\quad PEM\quad - 1834.039\quad WHI\textsuperscript{PEM}\]
\[9.996\quad (8.100)\quad (-5.019)\]

\[- 138.753\quad EDU\textsuperscript{PEM}\quad + 707.399\quad WHI\textsuperscript{NCF}\quad + 175.316\quad EDU\textsuperscript{SHF}\]
\[(-2.594)\quad (10.889)\quad (5.412)\]

\[- 4597.189\quad WHC\textsuperscript{SHF}\quad - 4489.429\quad WHC\textsuperscript{WLF}\]
\[(-3.641)\quad (-2.543)\]
**Table 27**

**All Expansions, Male Model**

**Terminal Model**

\[ R^2 = 0.278 \]

\[ \text{INC} = 7895.172 - 2.834 \text{AGE2} + 276.865 \text{WHI} \times \text{POP} \]

\[ (6.263) \quad (-5.378) \quad (9.374) \]

\[-8.782 \text{EDU} \times \text{POP} - 0.494 \text{OIN} + 0.003 \text{OIN} \times \text{POP} \]

\[ (-4.161) \quad (-6.756) \quad (2.595) \]

\[ + 4325.305 \text{WHC} + 1.814 \text{PCI} - 7.220 \times 10^{-5} \text{AGE2} \times \text{PCI} \]

\[ (4.840) \quad (14.888) \quad (-2.971) \]

\[ + 0.286 \text{MAD} \times \text{PCI} - 0.024 \text{EDU} \times \text{PCI} - 1.615 \times 10^{-5} \text{OIN} \times \text{PCI} \]

\[ (28.806) \quad (-3.185) \quad (-7.282) \]

\[ + 0.475 \text{WHC} \times \text{PCI} + 783.387 \text{AGE} \times \text{HSG} - 6.038 \times 10^{-5} \text{AGE2} \times \text{HSG} \]

\[ (7.650) \quad (23.547) \quad (-11.090) \]

\[-4962.007 \text{WHI} \times \text{HSG} - 751.936 \text{EDU} \times \text{HSG} + 0.170 \text{OIN} \times \text{HSG} \]

\[ (-7.110) \quad (-10.241) \quad (5.035) \]

\[-12422.174 \text{WHC} \times \text{HSG} + 1.407 \text{AGE2} \times \text{PNW} + 1219.012 \text{MAD} \times \text{PNW} \]

\[ (-13.578) \quad (7.591) \quad (3.396) \]

\[-1884.308 \text{WHI} \times \text{PNW} + 191.607 \text{EDU} \times \text{PNW} + 0.131 \text{OIN} \times \text{PNW} \]

\[ (-3.964) \quad (5.257) \quad (7.307) \]

\[-4832.621 \text{WHC} \times \text{PNW} - 99617.322 \text{PWC} + 490.094 \text{AGE} \times \text{PWC} \]

\[ (-10.531) \quad (-25.101) \quad (8.034) \]

\[ + 11069.817 \text{WHI} \times \text{PWC} + 4523.946 \text{EDU} \times \text{PWC} - 0.404 \text{OIN} \times \text{PWC} \]

\[ (6.080) \quad (19.773) \quad (-5.220) \]

\[ + 18746.697 \text{WHC} \times \text{PWC} + 4971.767 \text{PEM} + 0.061 \text{OIN} \times \text{PEM} \]

\[ (8.577) \quad (13.214) \quad (2.973) \]

\[ + 3962.383 \text{WHC} \times \text{PEM} - 2986.623 \text{NCF} + 317.569 \text{EDU} \times \text{NCF} \]

\[ (6.831) \quad (-6.796) \quad (12.560) \]

\[-0.046 \text{OIN} \times \text{NCF} - 1270.044 \text{WHC} \times \text{NCF} + 384.081 \text{AGE} \times \text{SHF} \]

\[ (-2.811) \quad (-3.150) \quad (16.006) \]

\[ + 0.136 \text{OIN} \times \text{SHF} - 31359.365 \text{WLF} - 5.253 \text{AGE2} \times \text{WLF} \]

\[ (2.275) \quad (-13.485) \quad (-4.899) \]

\[ + 0.662 \text{OIN} \times \text{WLF} \]

\[ (6.354) \]
Two different environments are compared. One metropolitan area is a small SMSA with a population of 100,000 with a low per capita income of $7,000 (PCI=7000). The educational attainment level of the population is low, 45% (HSG=0.45) and only 14% of the population is employed in white collar occupations (PWC=0.14). It has a high fertility rate (NCF=1.75) and is predominantly white (PNW=0.05). The percentage of unmarried heads of households which have women as their head of the household is low (SHF=0.70) and the percentage of the paid labor force which is composed of women is low (WLF=0.36). A high percentage of occupations are in the manufacturing sector (PEM=0.45).

This is a traditional metropolitan area with traditional values. It is poorer than the second SMSA which has a per-capita income of $13,000 (PCI=13,000). The traditional metropolitan area is smaller than the large progressive metropolitan area with a population of 5 million. The second metropolitan area has more high school graduates (HSG=0.88) and more white collar workers (PWC=0.37). It is ethnically more diverse (PNW=0.25) and has a larger feminized paid labor force (WLF=0.48). The fertility rate is lower (NCF=0.75) and more of the households headed by a single person are done so by women (SHF=0.85). The larger SMSA has fewer manufacturing jobs (0.05). It is a metropolitan area with progressive attitudes and many nontraditional lifestyles.
Emerging gender wage gaps are identified in some typical cases. The first case is a young single woman, age 24, white, a college graduate, in a white collar occupation, and $5,000 in other household income. She can expect to earn $13,168 in the small SMSA defined previously, while a man with the same characteristics can expect to receive $18,936 (Figure 15). This is a gender wage gap of $0.70. A young woman just out of college and working in a white collar job can expect to earn $0.70 for every $1.00 her male counterpart earns.

If she moves to a large SMSA with the environmental characteristics identified previously, she can expect a higher income of $18,001, while her male counterpart can expect to earn $20,393. This results in a smaller gender wage gap of $0.88. The new college graduates have smaller gender wage gaps in the more progressive metropolitan area. The greater frequency of nontraditional lifestyles in the larger SMSA provide a greater opportunity for women to approach the income levels of men.

The second typical case involves a 30-year-old married woman who is not white, has a high school education, works in a blue collar occupation, and has $10,000 in other household income. She can expect to earn $10,094 in the smaller, more traditional SMSA. Her income more than doubles in the larger metropolitan area to $15,819. A man
Figure 15: All Expansions, case 1
with the same characteristics can expect to earn more than the woman ($12,480) in the small SMSA, but he earns slightly less than the woman ($15,363) in the larger metropolitan area (Figure 16). The gender wage gap favors the man in the small SMSA ($0.81), while the man earns $0.97 for every female dollar in the large SMSA.

In the smaller metropolitan area, the traditional setting provides the advantage for men in blue collar jobs. For nonwhites the wages are low for both men and women but lowest for women. These high-school-educated women work in low-paying jobs. The nonwhite man can earn more in this setting. In the larger SMSA these men and women receive similar incomes. Both of their incomes increase, but the increase is most dramatic for women. The nonwhite woman with a high school education and working in a blue collar job can receive a higher income in the larger metropolitan areas and receive slightly more than her male counterparts. The lower incomes found in the smaller, more traditional metropolitan area dramatically affect these nonwhite women.

The third typical case is also for a 30-year-old woman. She is married, white, in a white collar job, a college graduate, and receiving $10,000 in other household income. Her income levels are drastically higher than the previous woman. She can expect to earn $14,727 in the smaller SMSA, while a male can expect over 50% more ($21,259). The gen-
Figure 16: All Expansions, case 2
der wage gap is $0.69, but the gap narrows in the larger metropolitan area to $0.81. Women's income expectations increase to $21,680 and the men's increase to $26,881 (Figure 17). This woman's opportunities for higher income levels is greater in the larger metropolitan area, but she never really receives comparable income with respect to her male counterpart. The gap is wider in the smaller SMSA, but still $0.81 in the larger metropolitan area.

The final typical case identifies an older woman aged 50, married, white, in a white collar job, high school educated, and with $10,000 in other household income. She can expect to earn $19,409 in the smaller, traditional metropolitan area, and her male counterpart can expect to earn slightly more at $20,091. This small gender wage gap of $0.97 indicates near equity. In the larger metropolitan area the income expectation levels increase dramatically to $30,739 for women and $29,369 for men. This gender wage gap favors women, but it is also near equity at $0.96 (Figure 18).

These older workers can expect near-equity with respect to gender. In addition, income levels are much higher for both genders in the larger metropolitan area.\(^4\) In both settings the gender wage gap is small for these older, high

\(^4\) The data do not include incomes over $75,000. Exclusion of those persons is likely to affect these relationships. Men with high incomes over $75,000 are likely to occur in this typical case.
Expected Income
(where
AGE=30
MAD=1
WHI=1
EDU=16
WHC=1
OIN=10,000)

$50,000
$48,000
$46,000
$44,000
$42,000
$40,000
$38,000
$36,000
$34,000
$32,000
$30,000
$28,000
$26,000
$24,000
$22,000
$20,000
$18,000
$16,000
$14,000
$12,000
$10,000
$8,000
$6,000
$4,000
$2,000

Smaller SMSA

Larger SMSA

(par where POP=ln(100,000)
PCI=7,000 HSG=0.45
PWC=0.14 NCF=1.75
PNW=0.05 SHF=0.70
WLF=0.36 PEM=0.45)

(par where
POP=ln(5,000,000)
PCI=13,000 HSG=0.88
PWC=0.37 NCF=0.75
PNW=0.25 SHF=0.85
WLF=0.48 PEM=0.05)

Figure 17: All Expansions, case 3
Expected Income
(where AGE=50 MAD=1 WHI=1 EDU=12 WHC=1 OIN=10,000)

<table>
<thead>
<tr>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>$50,000</td>
<td>$48,000</td>
</tr>
<tr>
<td>$46,000*</td>
<td>$44,000</td>
</tr>
<tr>
<td>$42,000-</td>
<td>$40,000-</td>
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<tr>
<td>$38,000-</td>
<td>$36,000-</td>
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<td>$34,000-</td>
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<td>$8,000</td>
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<td>$6,000</td>
<td>$4,000</td>
</tr>
<tr>
<td>$2,000</td>
<td>$2,000</td>
</tr>
</tbody>
</table>

Smaller SMSA (where POP=ln(100,000) PCI=7,000 HSG=0.45 PWC=0.14 NCF=1.75 PNW=0.05 SHF=0.70 WLF=0.36 PEM=0.45)

Larger SMSA (where POP=ln(5,000,000) PCI=13,000 HSG=0.88 PWC=0.37 NCF=0.75 PNW=0.25 SHF=0.85 WLF=0.48 PEM=0.05)

Figure 18: All Expansions, case 4
school educated white persons in white collar jobs.

6.1.13 Conclusions

These analyses revealed several different patterns in the contextual effects on the relationships associated with gender wage gaps. The first nine pairs of terminal models separately examined patterns in each of the nine contextual characteristics. These findings specifically identify the effects of one of the contextual variables on the micro-level relationships. These nine employ one macro-level variable at a time. This reveals the effects of that specific contextual variable on the relationships between gender wage gaps and the micro-level attributes.

The final pair of terminal models reveals the relationships present for a metropolitan area with a collection of attributes. Rather than identifying a metropolitan area defined by one specific characteristic, e.g., large vs. small or wealthy vs. poor, these final two models incorporate all of the contextual variables so that a composite of a metropolitan area is identified. This more specifically defines and, therefore, can more specifically identify an SMSA.

This final pair of equations reveals several findings. First, that larger, more progressive, more diverse metropolitan areas reward most men and women with higher incomes. Men's incomes increase in these larger SMSA's as
do women’s incomes. The spatial effects are evident. Where the individual lives is significant and it alters the income rewards. The relationships associated with gender wage gaps drift across space. The characteristics of the environment affect income levels. The contextual variations in gender wage gaps and the relationships associated with them are spatially variant.

In addition, these spatial variations are not the same for both men and women. For most women, their income advantages of the larger, more progressive metropolitan areas over the smaller, more traditional SMSA’s is greater than their male counterparts. In most cases, male incomes do not increase as dramatically as female incomes. The larger, more progressive, more diverse environments create greater advantages for women, and their incomes can begin to approach the income levels of their male counterparts.

Finally, the factors affecting the income levels of women are different than the factors affecting the income levels of men. The impacts of a specific variable on a person’s income varies by gender. Different variables have different impacts on women’s incomes, vis-a-vis men’s incomes.

The findings of this study are only the initial steps towards understanding the complexities associated with contextual variation in gender wage gaps. This study revealed
many avenues for continuance of this research. It provides the basis for future investigations relating to the concepts it introduces.
CHAPTER VII

CONCLUSIONS

Gender wage gaps have become a focus for a large body of research because increasingly more women have entered the paid labor force and increasingly more women have entered the ranks of the impoverished. Many different methodological frameworks, ideological approaches, and research designs have been utilized to investigate the patterns associated with gender wage gaps. Previous research agendas have examined gender wage gaps and their determinants. These studies focussed on identifying gender wage gaps and the relationships associated with them. They examined the impacts of different attributes of the individual on his/her income.

This research focusses on the spatial drifts in the relationships associated with gender wage gaps. A valuable feature of this study is its method for examining the contextual impacts on the micro-level relationships. It assumes that the environment is the underlying force which is the basis for variations in the relationships. The idea of place is not just another relationship to add into the
model, but it is the controlling influence that drives the model.

The implications of place influence the relationships between the individual's attributes and his/her income. The characteristics of the environment affect the relationships associated with a person's income, and these effects vary by gender. In identical environments women, vis-a-vis men, receive different incomes as a result of their individual attributes. Changes in context affect the relationships between personal characteristics and income for the individual. These contextual drifts vary by gender.

This study had several major objectives. The first is the creation of a mechanism for estimating individual incomes for specific persons in distinctive environments. Gender variations were identified by comparing income estimates for a particular woman in a designated metropolitan environment to income estimates for a man with identical individual attributes and in the same environment. A basis for this work was the creation of this mechanism identifying macro-level impacts on the relationships associated with gender wage gaps at the micro-level. This framework provides the basis for numerous directions for future research on gender wage gaps and further investigations of the realities of the relationships associated with them.
The creation of the data sets for use in further investigations was another major purpose of this research. The data sets employed included one extremely large micro-level data set of nearly 800,000 cases and a macro-level data set for the 317 metropolitan areas. Although the micro-level data set enhanced the credibility of the research, it also presented several problems.

The study also tested several hypotheses and identified empirical patterns in gender wage gaps. These hypotheses addressed the spatial variations in the relationships associated with gender wage gaps. The effects of spatial context on the micro-level relationships associated with income were investigated. The empirical patterns of gender variations in those effects were examined. The overall purpose of the research was to provide a clearer understanding of the statistically significant dimensions of the realities associated with gender wage gaps.

7.1 RESEARCH DESIGN

These relationships associated with gender wage gaps became the focus of many studies as a result of changes that occurred in the paid labor force. In recent years in the United States more and more women are entering the paid labor force, dramatically changing it. Accompanying this feminization of the paid labor force are changes in the
structure of the family. Women are now assuming the same financial responsibilities as men. They are the heads of households and families, yet they are becoming impoverished. The economic status of women is declining. Women are working in the paid labor force and requiring higher income levels yet not receiving them.

As the head of a family or household women are assuming greater financial responsibilities. Increasingly more women are no longer the secondary earner or unemployed wife in a traditional married-couple household. They are the primary or only source of income for their families. They support their children without financial help from the fathers of their children.

Women are assuming greater financial responsibilities even within dual-career families. The woman's income is just as essential to the family's economic well-being as is the man's income. Many dual-career families need both incomes in order to fulfill their financial responsibilities. Increasingly more husbands relocate because of a change in their wife's employment and more men's incomes are considered the secondary income source for the family.

In a time when women are assuming these greater financial responsibilities many are unable to fulfill them. The financial and economic status of women is declining. In recent years the number of impoverished women has dramati-
cally increased. More and more women are falling below the poverty line creating a feminization of poverty. Of those people below the poverty level, increasingly more of them are elderly widows, displaced homemakers, and single mothers.

More women may indeed be working in the paid labor force, but the low wages they receive exacerbate the problem of the feminization of household and financial responsibilities. Women have the same responsibilities as men, but men still earn more than women. Gender wage gaps continue to persist at times when women are assuming greater financial responsibilities. Women are assuming the financial responsibilities previously assumed only by men. Today women have similar financial responsibilities as men but not similar financial rewards.

A narrowing of gender wage gaps has not paralleled the increase in participation rates of women in the paid labor force. The influx of women into the paid labor force indicates improvements in the status of women, yet the small change in gender wage gaps reveals little improvement in their economic status. Gender wage gaps have changed very little over the last thirty years, while the feminization of the paid labor force has significantly changed. The paid labor force has experienced many changes as a result of the influx of women, but changes in gender wage gaps have not been among them.
Many studies have investigated gender wage gaps and examined the causes attributed to their persistence. The intent of most of these studies has been to account for the wage disparity and explain the relationships associated with it. Different disciplines have addressed gender wage gaps employing numerous theoretical perspectives, different methodological approaches and various data sets.

This research investigated spatial variations in the relationships associated with gender wage gaps. Rather than remove the relationships from their context, it is desirable to examine the environmental variations in the relationships. The assumption is that the relationships are contextually variant. It is suggested that the context of place affects relationships at the micro-level. This research assumed that the relationships associated with gender wage gaps vary according to the context in which they are located. These relationships are affected differently in a metropolitan area with more progressive attitudes than in an SMSA with more traditional lifestyles. This study focussed on the drifts in the relationships across space.

The environment is defined in this study as the metropolitan area. Therefore, the research identified the impacts that the characteristics of the metropolitan area had on the micro-level relationships. The drifts in these
micro-level relationships across different metropolitan areas were investigated.

Namely, the opportunities for a man in a larger, more progressive and diverse metropolitan area are different than the opportunities for a woman in that metropolitan area. Income levels may be higher for all persons in that larger metropolitan area, but the more progressive life-styles, attitudes, and employment practices create greater advantages for women, vis-a-vis men, in the larger metropolitan area. Women are at a greater disadvantage, vis-a-vis men, in the smaller, more traditional metropolitan areas because of the fewer opportunities, the less progressive attitudes, and the traditional married-couple family life-styles.

The purpose of this study was to identify gender variations in both the relationships associated with gender wage gaps and the contextual variations in those relationships. Therefore, two models were estimated: one for males and one for females. The female model revealed the effects of the spatial context on the relationships associated with her income. The male model identified the relationships associated with male incomes and their contextual drifts. A comparison of the two models revealed gender variations in these drifts across space.
The Expansion Method was the methodological framework employed to identify these variations in the effects of the macro-level environment on the relationships at the micro-level. This methodology treats relationships as if the context has an effect on them. The idea of place is a pervasive influence in the micro-level relationships associated with gender wage gaps, and the Expansion Method provides an advantageous approach towards identifying it.

Spatial drifts in the relationships between gender wage gaps and their determinants were revealed by the Expansion Method. Additionally, gender variations in these relationships and the drifts in them were identified. First, the same initial model relating income to individual characteristics was established for both men and women. Contextual drifts in these models were then identified in a terminal model for each gender. The estimated terminal model obtained for males was used to determine the estimated income for a man with specific individual attributes in a particular metropolitan area. The female model revealed the estimated income for a woman with the same attributes in that same SMSA. The gender wage gap was then revealed by comparing the two estimated incomes for a person with those attributes in that metropolitan area.

This technique revealed the impacts of the macro-level characteristics of the metropolitan area on the micro-level
relationships between a person's attributes and his/her income. Because it investigated both this macro-level environment and these micro-level relationships, it required two data sets: one macro-level and one micro-level data set. Both data sets were extracted from the 1980 United States Census. The macro-level data set was composed of the social and economic characteristics of the 317 metropolitan areas in the United States and the micro-level data set was comprised of nearly 800,000 individuals living in those metropolitan areas.

The macro-level data set included summary-level data that identified the social and economic attributes of the metropolitan area, e.g., per capita income and percent of the population that is employed in white collar occupations. The micro-level data set was a sampling of the individual records of persons residing within all of the metropolitan areas of the United States. It identified the individual attributes of the person, e.g., income and marital status.

The magnitude of this micro-level data set increased the quality of the research but created substantial problems. A data set of this size is difficult to manage and requires several adjustments within the statistical analyses and the access of computer time and work space.
7.2 UNIQUE STRENGTHS OF THE STUDY

The unique methodology, the magnitude of the micro-level data set and the specific intents of the research provided several strengths to this study. The intent of the research was to reveal the patterns and processes associated with gender wage gaps. Identification of these patterns was intended to lead to better understandings of the realities involved. While the motivations of the research are directed towards the enhancement of the status of women, the investigation was not an articulation of theories and ideologies but constructed to identify statistically significant dimensions of reality.

The premise for this research was not the presuppositions of a particular ideological or theoretical perspective. An investigation of the empirical realities associated with gender wage gaps was the basic intent of the research. The study focussed on the statistically significant patterns of reality that the research identified.

In its investigation of context this research also is distinctive. It examined the relationships between wage differentials and individual attributes and then the drifts in those relationships across varying spatial contexts. This aspect of context is a desirable feature within the constructs of the methodological framework of the study.
This study examined the initial relationships between gender wage gaps and their determinants as well as the impact that the context had on those relationships. It did not remove the relationships from the context, rather it assumed the environment was a dominant force affecting the prevailing relationships. Embodied in this research design is the assumption that the relationships are not constant over time, space, or other dimensions.

The drift in these relationships associated with gender wage gaps across space was the main purpose of this research. Specifically, income and education are positively related, as education increases so does income. However, that relationship is not constant over time or space. A college degree might have earned proportionately more in 1890 than it does in 1990. Similarly, it might earn relatively more in a metropolitan area where few people have college degrees than in an SMSA where most people are college graduates. Additionally, those enhanced earnings potentials vary by gender.

This methodology does not merely add space as another variable, e.g., a regional variable identifying north versus south, but it recognizes that the spatial context is the dimension which is the basis for variations in the relationships. The study is implicitly geographic in its sense of place. The idea that where you are and the con-
text of that place is a driving factor in the establishment of the relationships. The spatial implications are that the idea of place is the underlying force in the drifts of the relationships from place to place. The study is inherently spatial in this regard.

The magnitude of the micro-level data set provides another distinctive quality of the research. The use of such a large data set indicates that answers to any of the questions posed are from a vantage point that is greatly representative of the realities of the relationships. When smaller sample sizes are employed the risks of generalizations, which are not representative of the entire population, are increased. Generally, the larger the data set, the more accurately the data represent the total population. A data set with nearly 800,000 cases indicates one response stands for a fewer number of actual persons than an observation represents in a data set with fewer cases. As the number of people that a respondent represents decreases, the observation in more likely to accurately represent those people. The small nuances of variations in individuals are maintained.

Thus, the findings of the research are based on more credible relationships. The inferential framework of research employing large data sets is greatly enhanced by the magnitude of the number of respondents. The answers to
the questions of the research are not vitiated by noise or random error to the degree that they are in research employing smaller data sets. The use of the largest data set available increases the reliability of the research. A data set with a sample of nearly 800,000 cases is extraordinarily distinctive and dramatically enhances the credibility of the research.

7.3 CONCLUSIONS

The contextual impacts on the relationships associated with gender wage gaps were examined in this study. These spatial drifts were identified in the terminal models for both men and women. The first patterns in the contextual variance were identified in the first nine pairs of terminal models. These models specifically identified the effects of one of the contextual variables on the micro-level relationships. These nine models employed each of the macro-level variables, one at a time. The effects of each contextual variable on the relationships between income and the attributes of the individual were revealed in these nine separate pairs of terminal models.

The last pair of terminal models identified the relationships between an individual's attributes and his/her income in a metropolitan area defined by a collection of characteristics, not just one characteristic. The first
nine pairs of models identified a metropolitan area with one specific attribute, e.g., a large vs. small metropolitan area or a white collar vs. blue collar SMSA. However, the final two models defined all of the contextual variables so that a composite of a metropolitan area was employed. This more specifically defined and identified a designated metropolitan area.

An examination of this last pair of models for a composite metropolitan area revealed several results. In the larger, more progressive, more diverse SMSA's most men and women earn higher incomes. Both men's and women's incomes increase in these larger metropolitan areas. The spatial impacts are clear. The environment is a significant factor and it affects income levels. The relationships associated with gender wage gaps drift across space. An individual's income level is affected by the characteristics of his/her environment. The contextual variations in the relationships associated with gender wage gaps are spatially variant.

Moreover, these spatial drifts vary by gender. Most women and men realize an increase in income in a larger, more progressive metropolitan area, vis-a-vis a smaller, more traditional metropolitan area. However, the increase is greater for women. For most men, incomes do not increase as dramatically as incomes for women. The larger,
more progressive, more diverse environments create greater advantages for women, where their incomes can begin to approach the income levels of their male counterparts.

Lastly, the relationships associated with income levels for men are different than the factors impacting women's incomes. Gender variations in the effects of specific variables on a person's income were revealed. The variables affecting male incomes are different than those affecting female incomes. The drifts in these relationships also vary by gender.

The results of this research provided only the initial steps towards an understanding of the complexities associated with contextual variation in gender wage gaps. This research identified many paths for future research. It provided the suggestion for further studies relating to the concepts associated with gender wage gaps that it introduced.

7.4 FUTURE RESEARCH AGENDAS

Gender wage gaps drift across space. The micro-level relationships associated with gender wage gaps are affected by environmental changes. The concept of place is a useful feature in the understanding of the relationships associated with gender wage gaps. Contextual variations in the relationships between gender wage gaps and their determin-
nants provided the focus for this research. Gender wage gaps occur differently through space. This work identified the existence of the spatial variations and through the use of typical cases presented specific examples of these differences.

This research provided the basis for numerous subjects of future research. Many different approaches could be advanced towards new insights into the relationships associated with gender wage gaps. Only a few of the many are identified here. First, a study of a few particular SMSA’s could be advanced. Estimated incomes for typical cases in specific metropolitan areas is an anticipated extension of this study. Gender wage gaps for the designated SMSA could be identified and examined. The underlying relationships in that particular metropolitan area could be examined. The patterns and trends of these relationships could be identified and explanations proposed. A more indepth study of that specific SMSA could address the questions directed towards explanations of these variations.

A second direction for research could be directed towards examining racial wage gaps. This study would be constructed similarly to this research. A model for non-whites, vis-a-vis a model for whites, could be estimated and investigated. The contextual impacts of racial wage gaps and the relationships associated with them would be the focus of the study.
Another direction for future research could include examining a specific occupation and the contextual variations associated with it across space. This would entail an investigation of persons within one particular occupation. The relationships associated with gender wage gaps within that designated occupation would be examined and the spatial drifts in those relationships identified.

Yet another extension of this research would be a temporal study. Addressing questions on how the findings of this research have changed from 1970 to 1980 would be one focus. Moreover, the study might identify the contextual variance as temporal and expand the models over time rather than across space.

Finally, this study can be applied to Geographic Information Systems. This would visually identify the regional patterns associated with gender wage gaps. Mapping the gender wage gaps and the findings of the drifts across metropolitan areas would be the focus of this research.
Appendix A

SAS PROGRAM FOR THE MALE CORRELATION MATRIX

// JOB,
// REGION=4096K,TIME=(5,0)
/* JOBPARM TAPEIO=21000,DISKIO=50000,LINES=50000,V=SL
/* SETUP UNIT=TAPE9,ID=(TAPE01,P251,READ)
/* SETUP UNIT=TAPE9,ID=(TAPE02,P252,READ)
// EXEC SAS,WORK='450,5',TIME=(5,0)
//IN DD UNIT=TAPE9,VOL=SER=(TAPE01,TAPE02),
// LABEL=(1,SL),DISP=OLD,DSN=MICRO
// SYSIN DD *
DATA ONE;SET IN.MICRO;
IF (16 LE AGE LE 65) AND (WEEKSW79 > 26) AND (HOURS79 > 29)
   AND (SEX=0) AND (INCOME < 75000);
IF MARITAL > 0 THEN MAD=0;
ELSE IF MARITAL=0 THEN MAD=1;
IF RACE > 1 THEN WHI=0;
ELSE IF RACE=1 THEN WHJ=1;
IF OCCUP < 200 THEN WHC=1;
ELSE IF OCCUP > 199 THEN WHC=0;
OIN=HHINCOME-INCOME;
AGE2=AGE*AGE;

- 220 -
PROC CORR DATA=ONE; VAR AGE AGE2 MAD WHI GRADE WHC OIN INCOME;
/*
Appendix B

SAS PROGRAM FOR THE MALE'S FINAL MODEL

// JOB ,
// REGION=4096K,TIME=(15,0)
/*JOBPARM TAPEIO=100000,DISKIO=100000,LINES=10000,V=SL
/*SETUP UNIT=TAPE9,ID=(TAPE01,P251,READ)
/*SETUP UNIT=TAPE9,ID=(TAPE02,P252,READ)
/*SETUP UNIT=TAPE9,ID=(TAPE03,I212,WRITE)
/*SETUP UNIT=TAPE9,ID=(TAPE04,I189,WRITE)
/*SETUP UNIT=TAPE9,ID=(TAPE05,K008,WRITE)
/*UNUM TAPE9=2
./ EXEC SAS,WORK='450,5',TIME=(15,0),SORT=450
./ SASSWK01 DD UNIT=SYSDA,SPACE=(CYL,(450,50))
./ WORK2 DD UNIT=TAPE9,VOL=SER=(TAPE03,TAPE04,TAPE05),
./ DISP=NEW
./ IN1 DD UNIT=TAPE9,VOL=SER=(TAPE01,TAPE02),
./ LABEL=(1,SL),DISP=OLD,DSN=MICRO
./ IN2 DD DSN='TS4474.MACRO.DATA',DISP=SHR
./ SYSIN DD *
DATA ONE;SET IN1.MICRO;
X=1;
IF (16 LE AGE LE 65) AND (WEEKSW79 > 26) AND (HOURS79 > 29)
AND (SEX=0) AND (INCOME < 75000);

IF MARITAL > 0 THEN MAD=0;
ELSE IF MARITAL=0 THEN MAD=1;
IF RACE > 1 THEN WHI=0;
ELSE IF RACE=1 THEN WHI=1;
IF OCCUP < 200 THEN WHC=1;
ELSE IF OCCUP > 199 THEN WHC=0;

OIN=HHINCOME-INCOME;

PROC SORT;BY X SMSA;
DATA TWO;INFILE IN2;
X=1;
INPUT (SMSA PERSONS HSG INC PU PCFUNEMP
PCMUNEMP WLF PCURB PNW PCFNONWH PCMNONWH PCFEM PWC
PCAG PEM NCF PCMAR PCFMAR PCMMAR PC1HH SHF)
($4. 9. 7.4 8. 7.4 7.4 7.4 7.4 7.4 7.4 7.4
7.4 7.4 7.4 7.4 7.4 7.4 7.4 7.4 7.4 7.4 7.4);

PROC SORT;BY X SMSA:
DATA WORK2.THREE;MERGE ONE TWO; BY X SMSA;
POP=LOG(PERSONS);
AGEPOP=AGE*POP;
AGE2=AGE*AGE;
AGE2POP=AGE2*POP;
MADPOP=MAD*POP;
WHIPOP=WHI*POP;
EDUPOP=GRADE*POP;
OINPOP=OIN*POP;
WHCPOP = WHC \times POP;
AGEINC = AGE \times INC;
AGE2INC = AGE^2 \times INC;
MADINC = MAD \times INC;
WHIINC = WHI \times INC;
EDUINC = GRADE \times INC;
OININC = OIN \times INC;
WHCINC = WHC \times INC;
AGEHSG = AGE \times HSG;
AGE2HSG = AGE^2 \times HSG;
MADHSG = MAD \times HSG;
WHIHSG = WHI \times HSG;
EDUHSG = GRADE \times HSG;
OINHSG = OIN \times HSG;
WHCHSG = WHC \times HSG;
AGEPNW = AGE \times PNW;
AGE2PNW = AGE^2 \times PNW;
MADPNW = MAD \times PNW;
WHIPNW = WHI \times PNW;
EDUPNW = GRADE \times PNW;
OINPNW = OIN \times PNW;
WHCPNW = WHC \times PNW;
AGEPWC = AGE \times PWC;
AGE2PWC = AGE^2 \times PWC;
MADPWC = MAD \times PWC;
WHIPWC = WHI \times PWC;
EDUPWC = GRADE * PWC;
OINPWC = OIN * PWC;
WHCPWC = WHC * PWC;
AGEPEM = AGE * PEM;
AGE2PEM = AGE2 * PEM;
MADPEM = MAD * PEM;
WHIPEM = WHI * PEM;
EDUPEM = GRADE * PEM;
OINPEM = OIN * PEM;
WHCPEM = WHC * PEM;
AGENCF = AGE * NCF;
AGE2NCF = AGE2 * NCF;
MADNCF = MAD * NCF;
WHINCF = WHI * NCF;
EDUNCF = GRADE * NCF;
OINNCF = OIN * NCF;
WHCNCF = WHC * NCF;
AGESHF = AGE * SHF;
AGE2SHF = AGE2 * SHF;
MADSHF = MAD * SHF;
WHISHF = WHI * SHF;
EDUSHF = GRADE * SHF;
OINSHF = OIN * SHF;
WHCSHF = WHC * SHF;
AGEWLF = AGE * WLF;
AGE2WLF = AGE2 * WLF;
MADWLFL = MAD * WLF;
WHIWLF = WHI * WLF;
EDUWLFL = GRADE * WLF;
OINWLFL = OIN * WLF;
WHCWLF = WHC * WLF;

PROC REG DATA=WORK2.TREE; MODEL INCOME=MADPOP EDUPOP
   OIN WHC WHCPPOP AGEINC AG2INC OININC MADHSG WHCHSG EDUPNW
   OINPNW WHCPNW PWC AGEPW2 CAGEPW2 EDUPWC WHCPWC PEM WHIPEM
   EDUPEM WHINCPEM EDUSHE FWHCSHF WHCWLF;
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