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Identifying Factors That Influence Gender Disparities In Physician Income: Implications For Public Policy

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IDENTIFYING FACTORS THAT INFLUENCE GENDER DISPARITIES IN PHYSICIAN INCOME: IMPLICATIONS FOR PUBLIC POLICY

by

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ABSTRACT

Research has shown that female physicians continue to earn less than their male counterparts. From both social justice and feminist perspectives, laws requiring equal pay should provide just income for females as compared to males. However, the literature continues to indicate that in general females earn less than males, a trend that is also true for physicians. Theoretically informed postulates are measured here with structural equation modeling to test the influence of the unique latent construct "specialization" on the income gap while controlling for demographic and contextual variables. The analysis tests the assumption that the influence of specialization is the same for females and males. If the influence of specialization and other variables differs by gender, gender bias in physician income may be conceptually implied. The study uses three waves of data from the Community Tracking Study Physician Survey (CTS).

The study finds an income gap between females and males in three waves of the CTS. Gini coefficients show females continue to experience greater income inequality than males, with the Lorenz curves for males being closer to the equality lines. Using 1999 income data, there is a statistically significant income gap between female and male physicians when controlling for weeks worked. Information Technology (IT) use was found to be the most reliable construct measuring the unique latent variable specialization. Structural equation modeling showed indicators of specialization have an influence on the income gap. The variables in the CTS Physician Survey made for a poor construct that failed to measure specialization as a uni-dimensional construct. The variables that influence the income gap were different for females than for males. As policy makers revise or create better laws to protect income equality, gender differences must be taken into consideration.

I dedicate this work and my life to my Lord and Savior, Jesus Christ.

With God all things are possible, and to Him I give all the glory.

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LIST OF ACRONYMS

AAFP	American Academy of Family Physicians
AAMC	Association of American Medical Colleges
AMA	American Medical Association
AOA	American Osteopathic Association
CFA	Confirmatory Factor Analysis
CTS	Community Tracking Study
EEOC	Equal Employment Opportunity Commission
EPA	Equal Pay Act (1963)
FLSA	Fair Labor Standards Act (1938)
HMCA	Health and Medical Care Archive (Robert Wood Johnson data archive)
HSC	Center for Studying Health System Change
IWPR	Institute for Women's Policy Research
MGA	Multiple Group Analysis
NPC	Non-Primary Care (physician)
PC	Primary Care
PCP	Primary Care Physician
RWJ	Robert Wood Johnson Foundation
SEM	Structural Equation Model(ing)

CHAPTER ONE: INTRODUCTION

In 1938, when the Fair Labor Standards Act (FLSA) was passed, it included provisions for equal pay. The Equal Pay Act (EPA), signed into law on June 10, 1963 by President John F. Kennedy, made it illegal to pay females less for doing the same job as males do, on the basis of gender. The EPA (as it appears in volume 29 of the United States Code) was further defined by two landmark court cases: Schultz v. Wheaton Glass Co. (1970), U.S. Court of Appeals for the Third Circuit; and Corning Glass Works v. Brennan (1974), U.S. Supreme Court (Brunner, 2005). The 1970 case established that jobs that are "substantially equal" though not "identical" come under the Equal Pay Act. The 1974 case ruled that females were not to be paid less simply because traditionally they had received lower pay (Brunner, 2005). To address continued wage discrimination, two Congressional bills were introduced as recently as April, 2005 (http://thomas.loc.gov/). One bill has been proposed to amend the FLSA to end wage discrimination in female-dominated or minority-dominated occupations by establishing equal pay for equivalent work. In addition, Senator Hillary Rodham Clinton introduced the Paycheck Fairness Act, also to amend the FLSA, to provide more effective solutions for victims of wage discrimination (http://thomas.loc.gov/cgi-bin/bdquery/z?d109:s.00841:). Since the FLSA passed, dating back now almost 70 years, the substantial wage gap between females and males has narrowed only slightly. Despite the laws enacted and proposed, and continued efforts to close the wage gap, females continue to earn significantly less than males—a disparity that spans many occupations. The gender wage gap is far more than an equal rights concern; research has shown that closing the gap could have a significant effect on poverty levels in the United States (*Equal Pay for Working Families: National and State Data*, 2004).

In 1998, the AFL-CIO and the Institute for Women's Policy Research (IWPR) completed a national study that showed that working females with families lost an average of more than $4,000 every year because of unequal pay, even after the study accounted for differences in education, age, location and the number of hours worked (*Equal Pay for Working Families: National and State Data*, 2004). The report stated that ending the disparity could reduce the rate of poverty among single working mothers by half. The 2004 American Community Survey reported that of those families whose income in the past 12 months had fallen below the federal poverty line, 29 percent were female householders with no husband present (*United States: Population and Housing Narrative 2004*, 2004). The same survey showed that 11 percent of females over the age of 15 were divorced. As divorce rates rise, as females continue to be primary caregivers, and with the prevalence of households with single mothers increasing, equal income for females may reduce the number of female-headed households in poverty or struggling with a lifestyle substandard to that obtainable by similarly situated males. Comparing females and males with full-time persistent employment, one study found that 33 percent of females were earning less than a "minimally decent wage," compared to 7 percent of males. The researchers noted, "Men are simply not to be found among the ranks of persistent low earners" (Rose & Hartman, 2004, p. 18). Physicians may not be perceived as sharing financial concerns with females living on low wages or in poverty; however, the medical profession has been shown to have greater salary disparities by gender than any other profession in the U.S. (Weinberg, 2004). Moreover, with more than 70 percent of females between 25 and 54 in the workplace in various industries (*United States: Population and Housing Narrative 2004*, 2004), this study could be replicated in other professions to show a national pattern of inequality.

Problem Statement

Research has failed to explain the still prominent gender wage gap in the medical profession that Weinberg (2004) noted. Even with so many professions continuing to exhibit gender disparities in earnings, it is the medical field that reports point to as a prime example of an occupation with a significant wage gap (*Equal Pay for Working Families: National and State Data*, 2004; *Women in management: Analysis of selected data from the Current Population Survey 18-19*, 2001). Equal pay for equal work undoubtedly reflects wishful thinking more than reality. Even though since 1938 federal policy has protected equal pay, the evidence shows that discrimination continues: norms and institutional arrangements result in females earning less than males, which contributes significantly to U.S. poverty and reduces the well-being of children as well as females (Rose & Hartman, 2004).

In medicine, once an occupation dominated by males, females now comprise 24.6 percent of physicians in the workforce (http://www.amaassn.org/ama1/pub/upload/images/373/internettable.gif). In 2005, 48 percent of those enrolled in medical school were females (http://www.aamc.org/data/facts/2005/factsenrl.htm). With 205,903 female physicians in one of the highest paying occupations in the U.S. according to the AMA (2000), the scope of the problem is considerable. With more females entering and working in the medical profession, now is when its perpetuating problem of wage inequality should be ended. The often highly-regarded field of medicine should set a precedent for equal pay, given the education level and commitment required to enter into, and succeed in the profession. Given that peoples' lives may

depend on the skill and knowledge of all their physicians, female as well as male, the ongoing wage disparity among them has no justification.

It should not be surprising, moreover, that the disregard for gender equality in medical incomes may be reflected in the inequality of research on female health issues (Collins, 2003). Current goals of health care reform include achieving a sufficient balance between physicians and specialists in the workforce and promoting and supporting research on female health issues, as well as eliminating disparities in health care (Ellsbury, Baldwin, Johnson, Runyan, & Hart, 2002; Phillips Jr. & Starfield, 2003; Weeks & Wallace, 2002b). Resolving the income gap between female and male practitioners could be one more positive step in health care reform. With health care in the U.S. now at the center of political debate and universal health coverage being increasingly advocated, the increased reliance on primary care physicians that universal health care would entail, must be considered. Primary care physicians make less money than specialists, and females in the physician workforce are more likely than males to work in primary care. This prospect heightens the urgency of ensuring equality of pay between female and male physicians.

The wage gap among physicians has been studied for several decades. Using the mean net income from medical practice (before taxes) reported by physicians in 1972, Kehrer (1976) showed that females earned only 57 percent of what males earned. In a follow-up to Kehrer's study, Langwell (1982) found a 38.9 percent income differential between female and male physicians. Ohsfeldt and Culler (1986) found that female physicians earned 12 to 13 percent less than male physicians; they attributed the gender disparity to discrimination or otherwise unexplained factors. These authors suggested that if inequality continues, it may be that public

policy could create a marketplace where females receive equal pay for equal work (Ohsfeldt & Culler, 1986).

More recent studies attribute the ongoing wage gap to number of hours worked, time taken off work by females for family responsibilities, and females selecting less lucrative specialties and/or practice arrangements (Carter, 2005b; Tolkoff, 2005; Weiss, 2005). Several studies have attributed the wage gap to choice of specialty (Bazzoli, 1985; Kornstein, Norris, & Woodhouse, 1998; McMurray et al., 2000). However, two brain surgeons with substantially equal work responsibilities as defined in accordance with federal policy, including the FLSA and the EPA, should earn equal pay. That does not appear likely given the longstanding nature of the gender wage gap. The influence of specialty should be the same for females and males. This study will not try to explain why female-dominated specialties such as pediatrics often pay less than those dominated by males, such as surgery. Specialists are expected to earn more, but with all else being substantially equal, within any given specialty female and male physicians should earn equal pay.

It has recently been shown by the U.S. Census Bureau that 20 percent of the U.S. workforce is employed in "educational, health, and social services" (*American Community Survey*, 2004). This study, in its effort to assert the need for gender equality in medical income and to suggest how public policy may help to achieve it, examines a sub-set of that largest employment category. Setting a standard of equality for physicians could "trickle down" to affect other professions. Indeed, ultimately many more employees could benefit, especially since females make up close to a majority of the workforce according to the U.S. Census. Using a national sample, this study examines incomes of physicians in practice, using three waves of data while controlling for weeks worked. That control variable is especially important because the

literature shows that females often work fewer hours than males and are more likely to be employed part-time (Kehrer, 1976; Ness et al., 2000). Advanced statistical analysis is used to measure the relationship between specialization and gender, with the aim of measuring the influence of these two variables on income.

The research is guided by feminist and social justice perspectives. They are described further in Chapter three. From the perspective of social justice, a wage gap on the basis of gender is unjust. This research assumes that as long as there is equality in female and male physicians' income, holding other variables constant, no injustice concerning income occurs. The feminist perspective guides the study's analysis from the viewpoint previously presented: if the female physician earns less income than a male physician with substantially equal characteristics, gender bias is inherent. Feminists argue that income should not be influenced by gender, and that gender disparities in income reflect discrimination. This study measures the significance of factors that may explain the wage gap in physicians' incomes and how they vary between females and males. The purpose of the study is to create a model that reflects the entire scope of that medical income disparity problem. Advanced statistical modeling allows measurement of the interaction of variables, and not simply the effects of individual variables such as specialty. The study will measure the influence of specific variables, including specialization and gender, on the income gap.

Study Design

The aim of the study is to identify the gap in income between female and male physicians, explain the factors that influence the income gap, predict whether the gap may

continue, and recommend how policy can resolve gender disparities in physician income. Three waves of data allow a longitudinal comparison to reveal past trends, identify the factors that may continue to influence income and point to how policy may resolve the income disparity caused by those factors. Secondary analysis provides an opportunity to use data from a large, national sample.

Research Questions

1. How significant is the income gap between female and male physicians?
2. What is the relative influence of each factor that affects income earned by female and by male physicians?
3. What is the effect of physician specialization on that income gap?
4. Can the gender income gap in medicine be explained by demographic and contextual variables?

The research questions guide development of the alternative hypotheses tested in this study, which are as follows.

Hypotheses

H_1: There is a statistically significant income gap between female and male physicians.

H_2: Physician specialization is an important factor explaining the income gap between female and male physicians.

H_3: The relative importance of the factors explaining the income gap differs for female and for male physicians.

In a contribution to the literature on differences in physician income, this study calculates an income mean and measures physicians' deviance from the mean to indicate the "income gap." If the hypotheses are supported, and gender explains the income gap, this study will conceptually imply gender bias in physicians' earnings. Gender bias is operationalized as the expectation that a wage gap should not be explained by gender; therefore, any gap in income explained by gender may reflect bias.

The first research question is answered with a t-test to compare the two groups—females and males. Structural equation modeling provides both an overall test of model fit and individual parameter estimate tests, simultaneously. SEM tests the validity of specialization having the same influence on females and males. Control and contextual variables were selected based upon previous research postulates, for comparison to other studies.

Conceptual Model

To explain gender disparities in physician income, this study employs a cross-sectional design, using data from the national Physician Survey conducted for the Community Tracking Study (CTS, 1996-1997, 1998-1999, 2000-2001) sponsored by the Robert Wood Johnson Foundation (RWJ). From a theoretically informed framework, the conceptual model defines physician income as a function of years in practice, age, board certification, practice setting, specialization, total hours worked per week, weeks worked per year, and specialty. Normality of the sample is determined by descriptive analysis. Multivariate analysis is used to explain the factors that contribute to the income gap between females and males. Using SEM, the relationship between specialization and gender is tested. Finally, to test the measurement of

specialization, correlation analysis and exploratory factor analysis are employed. The overall influence of gender is tested using structural equation modeling.

The EEOC considers the following factors to establish wage discrimination: skill, effort, responsibility, working conditions, and establishment. The study's conceptual model emerges from these factors, as shown below in Figure 1.

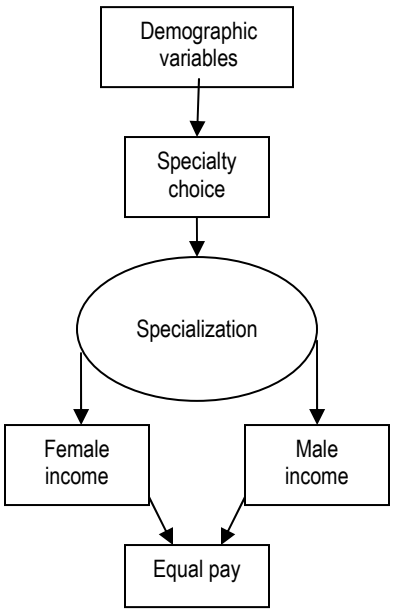


Figure 1: Conceptual Model

The conceptual model, guided by social justice and feminist perspectives, expects equal pay for females and males while measuring the latent construct of specialization and holding demographic variables constant. It is known that particular specialties correlate positively with income. This study uniquely considers "specialization" as a latent construct that affects physician income. The specialization concept is explained further in Chapter four.

Population and Sample

The restricted data file was obtained from the Robert Wood Johnson Foundation Community Tracking Study (CTS) Physician Survey for 2000-2001. Public-use files for 1996-1997 and 1998-1999 were downloaded from the Health and Medical Archive (HMCA) website, the official data archive of the Robert Wood Johnson Foundation. The HMCA is currently distributing the first three rounds of the CTS Physician Survey, including the restricted data from the most recent wave (2000-2001). Designed to track a cohort in two-year intervals since 1996, the CTS Physician Survey was conducted again in 2004-2005 and that data has not been released as of this writing.

The CTS is a large-scale longitudinal investigation of health system change. The study examines ways in which hospitals, health plans, physicians, safety net providers, and other provider groups are restructuring their systems, and the forces driving the organizational change. The CTS uses a nationally representative sample with 60 sites, including 51 metropolitan areas and 9 non-metropolitan areas that were randomly selected. Twelve of the sites are metropolitan areas with more than 200,000 people. The CTS Physician Survey includes data from interviews with physicians in the 60 CTS sites and with a supplemental national sample of physicians. The survey was administered to more than 12,000 practicing physicians. Topics included in the survey are: physician supply and specialty distribution, practice arrangements, sources of practice revenue, level and determinants of physician compensation, effects of care management strategies, and physicians' allocation of time, provision of charity care, and career satisfaction.

Endogenous variables for the present study are determined by the data available as well as by theoretical considerations and previous research. The endogenous latent measure of

specialization is defined by the following characteristics: education, board certification, use of technology, practice setting, and years in specialty practice. Income gap is also measured as an endogenous variable. Demographic and contextual exogenous variables are controlled.

The sample size is reduced only by those who do not report income or other variables essential to this study. Stratified random sampling is used to ensure an adequate number of physicians for each region as well as each specialty. In a previous study that used the CTS data, only those specialties with more than 40 physicians were analyzed; this study uses the same benchmark (Leigh, Kravitz, Schembri, Samuels, & Mobley, 2002). An effort is made to have similar-sized groups, because the ideal is to have equal-size groups. If the sample sizes are not proportional to population sizes, errors of inference are more likely (*AMOS FAQ #3: Multiple group analysis*, 2004). The 2000-2001 Physician Survey includes 12,406 cases, so it is essential not to overpower the sample. Characteristics of those participating in the three rounds of the survey are reviewed for significance to this study. It is expected that fewer females will be seen in all three waves, given that they are more likely than males to work less than 20 hours or to have taken time off for childbirth or childrearing, and that females are more likely to consider leaving the medical profession during their careers (Ash, Carr, Goldstein, & Friedman, 2004; Brown, Swinyard, & Ogle, 2003; Schroen, Brownstein, & Sheldon, 2004).

Procedures and Data Collection

The 2000-2001 CTS Restricted Data File was obtained because it provides income as a continuous variable. The Public Use Files categorize income in increments of $50,000, in seven

categories (see Appendix E). The entire data set was encrypted. It was unencrypted only for analysis.

Data files were securely stored in the Public Affairs Doctoral Program Informatics Research Laboratory. The Informatics Research Laboratory has a dedicated server that was used to store the restricted data. The secured lab server room is located in the Bennett building. The data file was password protected. When data diskettes were not in use, they were locked in a file cabinet. Data will be deleted within a reasonable time frame after the completion of this study.

Institutional Review Board approval was obtained on March 8, 2006 (Appendix A). The study received an expedited review because of the use of secondary data collected and provided by the Robert Wood Johnson Foundation.

Scope and Generalizability

With the availability of a national data set, this study is generalizable for the physician population. This study makes a unique contribution to the literature by affirming previous salary studies that show gender differences in income, and by providing a model that may be replicated in other industries and professions to test gender disparities in income. Furthermore, the modeling considers the entire scope of the income gap and the interaction of variables instead of using only one variable (i.e. hours worked, specialty) to explain the disparity. England (2004) asserts, "The challenge is to study gender in a way that does not falsely universalize, while looking beyond the unique aspects of each situation to search for broad patterns that help us understand what explains continuity and change in gender" (p. 5914).

Delimitations and Limitations of the Study

The study has several limitations to note and is also delimited by use of the Community Tracking Study Physician Survey. The CTS does not include a sample of physicians in academia. Also, to be included in the sample, physicians must work 20 hours per week or more, and this may skew the sample with more males than females. The CTS does not provide data to measure skills or attributes that can affect income, such as ambition and attitude. Other factors that may lead to gender inequality but are not measured are lack of mentorship, exclusion from peer networks, sexual harassment, and inadequate polices to support females.

This study aims to determine factors that influence income; it does not consider quality of care. Previous studies have shown that females spend more time with patients and perhaps provide better care. Such quality differences are not measured here; therefore, the influence of quality on income is not measured. Income is certainly affected by other variables not included in this study: social systems, culture influences, political forces, and family considerations. Notwithstanding the limitations, the study reveals the importance of various factors included in the CTS that influence income disparities in physicians' incomes.

Implications for Public Policy

"Wages – even, ironically, equal wages – were a social practice that could be utilized either to preserve men's labor market privilege and, thereby, their masculinity, or to enhance women's economic status. The U.S. Equal Pay Act, as passed, did both. A hierarchy that elevated men's jobs above women's jobs was upheld" (Mutari, Figart, & Power, 2001, p. 47). Employees are protected from compensation discrimination by several Federal Laws: the Equal

Pay Act of 1963, Title VII of the Civil Rights Act of 1964, the Age Discrimination in Employment Act of 1967, and Title I of the Americans with Disabilities Act of 1990. "The Equal Pay Act of 1963 set in place a process for redressing the most blatant forms of wage discrimination and legitimated a basic feminist precept. 'Equal wages' was now a matter of national policy" (Mutari et al., 2001, p. 28).

Despite that national policy, there clearly remains a need to enforce the laws that established the policy of equal pay for equal work. In particular, current enrollment in American medical colleges shows that females are entering medicine at a rate almost equal to that of males, making it high time to strengthen enforcement in medicine of the laws requiring equal pay. Across all employment sectors, however, legal remedies and policies could help make the workplace family-friendly and provide comparable-worth wages for traditionally "female" roles. With research continuing to show a long-standing wage gap, U.S. policy makers should be challenged to provide an atmosphere where family care and work is balanced in a way that resolves the gender-based inequality in earnings and ultimately provides greater long-term economic security for both females and males (Rose & Hartman, 2004). An additional important policy consideration is whether income may affect physicians' willingness to treat Medicare patients, in which case issues about incomes should figure prominently in policy formation (Reed & Ginsburg, 2003).

The U.S. Equal Opportunity Commission (EEOC) enforces the laws that protect equal wages. The Commission's responsibility is to ensure that jobs that require substantially equal skill, effort and responsibility, and that are performed under similar working conditions within the same establishment require equal wages for females and males. The EEOC specifically looks at the following when considering pay discrimination: skill, effort, responsibility, working

conditions, and establishment (http://www.eeoc.gov/facts/fs-epa.html). Although the Equal Pay Act was passed now more than 30 years ago, the EEOC still recovers millions of dollars each year for female employees whose rights to equal pay have been violated (Rose & Hartman, 2004). Although some of the EEOC's criteria may be considered subjective, the objective data for this study should provide a relatively clear indication of how gender explains the wage gap. If an income disparity by gender is indeed revealed, the finding will underscore that national policies must be enforced better, or that more effective public policy is needed to ensure equality in pay—not only for physicians, but for all females in the workplace. As females enter traditionally male roles in medicine such as neurosurgeon and cardiologist, as well as entering other professions outside of medicine, the hierarchy that values males' work over females must be dissolved. Equal wages must be upheld in accord with federal policy such as the FLSA and the EPA.

Summary

The medical profession infamously presents greater salary disparities by gender than any other profession in the U.S., with a female physician making on average 63 cents for every dollar a male makes (Weinberg, 2004). According to the American Medical Association, females comprise 24 percent of the physician workforce. Furthermore, females now represent almost 50 percent of all students currently enrolled in medical school (http://www.aamc.org/data/facts/2005/factsenrl.htm). With females becoming physicians at a greater rate, concerns about fostering a balanced physician workforce highlight the need to mentor females in a way that eliminates medicine's "glass ceiling." The gender disparity in

physician income remains significant and may be a clear indicator of inadequate enforcement of policies requiring equal pay for equal work. Although specialty choice and hours worked can attribute to income differences, those reasons do not fully explain why females continue to earn less than males. This study uniquely considers specialization as a latent construct that goes beyond specialty choice. There is a need for a model to clearly identify the factors that influence income and the relative importance of these factors for females and males. Theoretically, the social justice and feminist perspectives guide the belief that females and males should earn equal pay for equal work and that income should not be influenced by gender.

An equal rights issue, income disparities appear well beyond the medical profession. With the U.S. Census Bureau reporting that females comprise 46.3 percent of the civilian workforce 16 years of age and over (*American Community Survey*, 2004), the highly regarded vocation of medicine could set a precedent for upholding federal policies that put an end to equal pay for equal work being only a myth. Medicine could provide a model for equality and justice. Using structural equation modeling, and comparing three waves of data from the Community Tracking Study Physician Survey, the design in this study will reveal the influence of gender and other factors on the income gap. If gender explains income disparities, while controlling for other variables, discrimination will be conceptually implied. Despite certain limitations, this study will make an important contribution to the literature in an effort to shape or enforce public policy that protects all employees from gender-based wage discrimination.

CHAPTER TWO: LITERATURE REVIEW

The literature reviewed here informs and guides this research study. The first section provides information about the gender-based wage gap by providing a brief history of gender issues, and reviewing salary studies and research on females in the workplace and particularly in medicine. Next, since specialty selection has a profound impact on physician income, research on specialty choice is presented. The literature reviewed also describes gender differences and appropriate control variables that may be used to isolate gender in an effort to explain the wage gap in physicians' income.

History of Gender Issues

"Gender, as the term is used in the social and behavioral sciences, refers to all of the ways in which being a male or female, or being socially classified as such, effects one's life. Many facets of gender inequality flow from social norms, beliefs, laws, and institutional practices" (England, 2001, p. 5910). Gender discrimination refers to "behaviors, actions, policies, procedures, interactions, etc., that adversely effect a woman's work due to a disparate treatment, disparate impact, or the creation of a hostile or intimidating work or learning environment, " ("Gender discrimination in the medical profession," 1994, p. 5). It is important to consider gender in American history in order to understand how this study contributes to the growing body of literature on gender and income inequality.

Social stratification in America dates back to when what is now the U.S. was newly settled by colonists. Collins (2003) reports that the chaos in the early southern colonies resulted in the "normal" boundaries being overlooked, creating an environment where females

functioned, “with an independence the nation would never really see again until the twentieth century” (p. 12). She goes on to say, “The colonists did not develop new philosophies about the proper role of women in society—they did not have the means to enforce old rules that most of them still adhered to in theory” (p. 16). Such rules included prohibition from voting and holding office. With varying roles and rules, the argument has gone on for generations about gender roles and differences in the expectations for females and for males.

Only recently has “women’s studies” become an academic discipline whereby the history of females and their significance in the world is being evaluated and shared. In Judeo-Christian cultures, argument about gender roles often begins with the Garden of Eden story from the first chapter of Genesis in the Bible. “Women were viewed as the morally unreliable descendants of the sinful Eve” (Collins, 2003, p. 87). Bem (1993) also refers to the biblical interpretation that woman came from man and has been essentially inferior since creation. One might note, however, that the Christian Bible can be cited as supporting equality: “There is neither Jew nor Greek, slave nor free, male nor female, for you are all one in Christ Jesus” (Galatians 3:28). Although the separation of church and state under the U.S. Constitution makes biblical arguments irrelevant to federal policy, on the unacceptability of gender bias Paul’s letter to the Galatians and federal legislation concur. In any case, evidence is plentiful that females continue to be perceived as the weaker gender, and also as less dedicated to their careers than their male counterparts because they undertake employment gaps for child rearing. Females in the workplace also incur criticism as being poor communicators, and their unequal pay is sometimes attributed to their not being assertive enough to ask for pay raises. In innumerable ways, then, gender continues to stand in the way of equality, despite federal policy.

Gender is viewed as a system of social relations that is embedded in the way major institutions (including the workplace) are organized (Acker, 1990; Lorber 1992, as reported in Reskin, 1994). Researchers have defined sex as physiological, and gender as social or cultural (Reskin & Padavic, 1994; Sapiro, 1986). Gender ideology stems from a complex and interwoven set of beliefs and ideas that have changed over time. From 1870 to 1970, all-male Supreme Courts defined females androcentrically not as citizens, but in terms of their domestic and reproductive functions within a male-dominated household (Bem, 1993). Describing several binaries: rational, emotional; cultured, natural; strong, weak; Gergen (1999) says, "Although the linguistic terrain is far more complicated, these stereotypic ways of talking do seem to place women at a disadvantage, and they do so without our capacity to identify the actual existence of the [psychological] states" (p. 109). Rhetoric is often an expression of a patriarchal culture indicative of androcentrism. Textbooks and studies use various nomenclatures when discussing gender and related issues. Some argue that use of "woman" and "man" implies meaning beyond that of the description. Identifying only biological sex requires the use of "female" and "male." "Gender can be viewed as the interpretation of the significance of sex. Gender roles are organized patterns of behavior we follow that are based on our interpretation of the significance of sex. They structure our choices and guide our behavior in ways that are viewed as gender appropriate. … It is also difficult to disentangle sex and gender because of the difficulty of determining causation: Which causes a person to act in a certain way—biology or society?" (Sapiro, 1986, p. 68). This study uses the Webster's dictionary definition of gender to describe being female or male and being considered as a part of a group, females or males.

"The History of American women is about the fight for freedom, but it's less a war against oppressive men than a struggle to straighten out the perpetually mixed messages about

women's role that were accepted by almost everybody of both genders" (Collins, 2003, p. xiv). In her text, *America's Women*, Collins aptly describes the paradox of females' roles when discussing the life of Sarah Josepha Hale, editor of *Ladies' Magazine* from 1827 to 1836 and *Godey's Lady's Book* from 1837 to 1877. "It would be hard to find a more perfect example of the contradiction of nineteenth century womanhood than the workaholic editor continually reminding her readers how lucky they were to be presiding over the hearth rather than engaging in 'the silly struggle for honor and preferment' in the outside world" (p. 87). In the mid-1600s, at the height of their power, colonial females were valued and their duties balanced when survival required an interdependence of the females and males in a household that was not only necessary but also nurtured. When males began planting and selling cash crops in the early 1700s, the roles began to change as money earned was used to buy things that females had once made, such as cloth (Collins, 2003).

Another author relates how in the 1800s capitalistic, industrialized society, factory owners began to exploit immigrant, black, and poor females. In the early 1900s, a woman working outside of the home suggested her husband's economic failure, and the disparities in class and ethnicity became increasingly evident (Lipman-Blumen, 1984). Although the 1800s found some females in dual roles as employees and homemakers, a homemaker's domestic work was, and still is, unpaid. Females' importance in the workplace was minimized. The exploitation of females was evident in their being expected to do two jobs: one unpaid and the other grossly underpaid. To understand sexism, an examination of the historical context of capitalism is necessary (Ehrenreich, 2005).

"Over the centuries, we have used it [the sex-gender system] as the blueprint for all the other power relationships that we constructed to create an illusion of existential control. Rapidly

changing conditions now require us to revise the blueprint to meet the demands of the twenty-first century. To respond to this challenge, females and males, through personal relationships and public policies, will need to create new social forms—a new blueprint" (Lipman-Blumen, 1984, p. 206). Reskin (1994) describes the sex-gender hierarchy whereby, "Distinguishing females and males is necessary in order to treat them differently and sex differentiation based on genitalia and gender differentiation is a social process to exaggerate differences between sexes and distinguish activities as female or male" (p. 3). Females are increasingly employed full-time outside of the home, yet their full-time work is viewed differently as demonstrated by the gender disparities in income. Gender-based behavior, policies, and action that lead to disparate treatment or an intimidating environment is how the literature defines gender discrimination (Carr et al. 2000; Lenhart and Evans 1991 as reported in Carr et al. 2000; England, 2004). Let us now consider research that has tested salary disparities and the role of gender in the income gap.

Salary Studies

Research in various disciplines has focused on income disparities by gender (Auster, 1989; Ferber & Spaeth, 1984; Smith, 1995). Notwithstanding her own research, Auster (1989) concludes, "Sex inequality in wages is a phenomenon so imbedded in the social, economic, and organizational structures of our society that no single research approach can fully explain it" (p. 188). Ferber and Spaeth (1984) refer to nine studies that have increased the explanatory power applied to the wage gap by taking into account occupations. They also cite Whitman's (1973) study that showed almost no earning differential within the same establishment as long as detailed job classifications were used. This looks like the explanatory loophole that Schultz vs.

Wheaton Glass Co. (1970) blocked. Whitman's study is useful particularly for its focus on one occupation, so that explanatory power can be appropriately expressed. Twenty years later, a 1995 study of CFO compensation found that females earn about 75 cents for every dollar earned by males, with the exception of the general accounting manager position (Smith, 1995). It is interesting to note that Smith (1995) found the lowest paid positions significantly more likely to be held by females than by males. A recent study found that despite having advanced education and specialized skills, females who enter high-paying fields, which are often dominated by males, do not command relatively higher pay (Rose & Hartman, 2004). Although the phenomenon of females entering top-tier positions is relatively new and they may not have the same level of experience as males, in high-pay fields they may also enter lower-paying niches and perhaps meet discrimination in pay and promotion more severe than they would find in lower-paying professions or in traditionally female roles (Rose & Hartman, 2004).

Job satisfaction is an important factor in retaining employees. Studies have looked at the role compensation plays in employee satisfaction (Phelan, 1994; Stoddard, Hargraves, Reed, & Vratil, 2001). Should compensation effect job satisfaction and perhaps job tenure, it would be important to understand how gender disparities in income could influence a female's career choice.

The challenge for researchers is to operationalize "work of comparable worth," a step badly needed to realistically study "equal pay for equal work," which per se has not been shown to close the earnings gap between females and males (Ferber & Spaeth, 1984). Auster (1989) uses task characteristics as a bridge between micro and macro-level research on salary inequality. She finds that gender bias in performance appraisal and salary allocation increases when tasks are "unpredictable, variable, complex, and interdependent." Such tasks lead to subjectivity in

evaluations and "male sex-typing." It could be argued that medicine's tasks fit Auster's description and that female physicians earn less money perhaps because they thus receive lesser appraisals than their male counterparts do. Females often are likely to be evaluated by males. That too could contribute to the "glass ceiling" for female physicians, which limits their pay because they are unable to move up in the hierarchy.

When studying CFO compensation in healthcare organizations, Smith (1995) found that organization size influences pay. In addition, education, gender, job responsibilities, geographic location of the organization, organization type (i.e. multi-unit system, stand-alone hospital) and organization ownership such as not-for-profit or group-owned also affected CFO income. Weeden's (2005) study of the impact of flexible work schedules on wages found such arrangements to have little impact toward reducing the gender gap in pay, or what she calls the "motherhood wage penalty." Females, on average, earn less money than males, and her study found that flexible work arrangements had equal consequences for both females and males leaving income inequality unchanged (Weeden, 2005). Phelan (1994) suggests an own-gender-referent hypothesis in support of a study by Zanna, Crosby, and Lowenstein (1997) that found female employees were more satisfied when they compared themselves to other females rather than males. "…Women feel as positively as men about their employing organizations, despite their lower salary grades, because organizational satisfaction depends not on salary but on subjectively appraised factors such as intrinsic and importance rewards" (Phelan, 1994, p. 104). Citing equity theory, Phelan suggests, "…the perception of inequity contains the seeds of its own destruction because the aversiveness of the experience motivates behavior and/or psychological distortion aimed at restoring perceived equity. If it is impossible to change the situation—for example, by receiving a pay increase or changing to a better-paying job—the situation may be

distorted psychologically so that it is no longer perceived as inequitable" (p. 105). Kahn (1972) and Major and Konar (1984) (both as reported in Phelan, 1994) found that females expected to earn less than males suggesting that females are socially constructed to expect a lower wage for their work and consider it just. If females had less education or job tenure, or made less effort, then lower rewards for females would be perceived as equitable. However, Phelan (1994) also reports previous studies indicating that in professional occupations, females were indeed found to have less pay satisfaction than males. Greenberg (1989, as reported in Phelan, 1994) demonstrated that one response to inequity is cognitive distortion. The literature presents arguments that income affects satisfaction, yet females are essentially complacent with unequal pay. The complacency may be attributable in part to differences in how important such rewards as salary are to females, and also to the shared low income expectations among females. It is difficult to believe, however, that females are satisfied with lower earnings, given their poverty levels and the fact that they often carry the burdens of homemakers, as well, for no pay. Females may not be satisfied or complacent; instead, they may be resigned to earn less pay than their male counterparts because they fear losing their jobs if they "rock the boat." Previous salary studies indicate certain variables that affect income such as education, gender, job responsibilities, geographic location, organization type, and work schedules. Let us now consider the conditions for females in the workplace.

Females in the Workplace

The U.S. Census Bureau reports that males, on average, earn more than females. The female-to-male earnings ratio even declined from 77 percent to 76 percent between 2002 and

2003 (*United States: Population and Housing Narrative 2004*, 2004). In May 2005, the U.S. Department of Labor, Bureau of Labor Statistics, released "Women in the Labor Force: A Databook," which shows that earlier, between 1979 and 1994, females' earnings compared to males' had increased by 18 percent, from 62 to 80 percent. That dramatic increase is not surprising, since females' educational attainment has risen sharply, and so has the trend for females to move into higher paying occupations as well as management and professional positions. What is surprising is that despite the improvement, the same Department of Labor report shows female physicians and surgeons earning 52.2 percent of males' earnings. As females continue to move into traditionally "male" fields and into higher level positions, should they not receive equal pay for equal work?

For thirty years, researchers have shown that females make less money than males and that "equal pay for equal work" is not yet true (Ash et al., 2004; Baker, 1996; Blau & Kahn, 1994; Brown et al., 2003; Ferber & Spaeth, 1984; Hoff, 2004; Kehrer, 1976; Langwell, 1982; Wallace & Weeks, 2002). Today, despite females comprising a large percentage of the workforce in the U.S., they continue to earn less than males. Studies of many professional fields including sociology, psychology, and economics have shown that gender disparities in earnings are almost commonplace. Indeed, even females with graduate degrees now earn only slightly more than males who have not been to college (Rose & Hartman, 2004). The problem has been analyzed from a range of viewpoints. From the perspective that inequality is just if working females and males accept the disparity, Phelan's study (1994) suggests that gender equality lags because of the difference between objective rewards and subjective satisfaction, with females content to enjoy job satisfactions other than salary. On the other hand, England (2004) argues that the sexism that keeps females out of high-paying positions also devalues the professions

such as nursing or secretarial administration in which females work, which limits their earnings. "Sex composition of jobs exerts an effect on how much employers are willing to pay" (England, 2004, p. 5913). That is true in medicine: female-dominated specialties such as pediatrics and obstetrics/gynecology tend to pay less than male-dominated specialties like surgery or gastroenterology. Another difficulty is that females who focus on family spend less time in the labor market, and hence their skills are often considered of less worth (Reskin, 1994). Moreover, females have difficulty making up for lost wages over their lifetime even if they spend significant time in the labor market despite gaps for child rearing (Rose & Hartman, 2004).

The first hypothesis for this study, that there is a statistically significant income gap between female and male physicians, is deduced from the literature. Although the literature shows that females in many occupations earn less wages than males, this study focuses on physicians only. The literature clearly informs the need to determine the wage gap that may exist between female and male physicians given that this is the case in many previous studies and in other professions. Establishing a wage gap between females and males lays the foundation for this research.

Females in Medicine

Females' entrance into medicine in such large numbers is a relatively recent phenomenon, so it may be that their peak earnings are yet to be realized (*Gender discrimination*, 1994). Many researchers have studied the gender disparities in income for females in medicine, examining how specialty choice and other variables affect income. Weinberg (2004) finds that although physicians and surgeons have the highest median earnings for both females and males,

a female physician makes 63 cents for every dollar a male makes. A report by the AMA Council on Ethical and Judicial Affairs noted, "Harmful stereotypes can also influence whether women's work is rewarded equally with men's, with commensurate pay, grades, verbal encouragement, and opportunities for advancement" (*Gender discrimination*, 1994, p. 5). Female physicians are especially affected by the social context and their interpersonal relationships. For example, one study found that conflict between work and parental roles is common, making social support from the spouse critical, and also emphasized the importance of the work environment (Ducker, 1994). Researchers who studied how physicians were successfully recruited to rural towns in the Northwest found that female physicians were influenced by issues related to spouse or partner, flexible scheduling, family leave, availability of child care, and the interpersonal aspects of recruitment (Ellsbury et al., 2002). One study suggested that there is a more egalitarian relationship between female ob/gyn physicians and their patients than their male physician counterparts perhaps because the specialty is viewed traditionally as one for females (Kutner & Brogan, 1990). In a presidential address to the American Academy of Physical Medicine and Rehabilitation, Wolfe (2005) noted that gender differences continue in diagnosis, treatment recommendations and responses, and research in medicine. Even as more research on women's health issues is being called for, females are less likely to choose to be physician-scientists (Guelich, Singer, Castro, & Rosenberg, 2002). Despite females entering medicine at a growing rate, remarkable differences in specialty stratification, income, and academic representation continue (Wolfe, 2005).

Female physicians work fewer hours and enter into different specialties than males do (Levinson & Lurie, 2004). Nevertheless, as more females are representative of the profession, the effective physician supply will be reduced by only four percentage points (Kletke, Marder, &

Silberger, 1990). As primary care is becoming stereotyped as a female specialty, female physicians are challenged to balance professional visibility and promotion of female health issues (More & Greer, 2000). When choosing primary care, females are influenced by personal and family factors (Xu et al., 1995). With females entering medicine at a rate almost equal to the rate for males, their tendency to choose primary care specialties could lead to shortages in the others.

Research has been successful in bringing gender inequality among physicians to the forefront for debate and consideration; however, the factors that influence the inequality in income have not been adequately identified. Levinson and Lurie (2004) suggest, "To the degree that compensation is correlated with social status, increasing the number of female physicians with less earning power may lead to reduced status of the medical profession and less generous compensation for the profession as a whole" (Levinson & Lurie, 2004, p. 473). Their article cites little empirical research. Hess points out that physicians are people with varied interests whose pathways must be safeguarded (Hess, 2005, p. 471). Perhaps those pathways include lower paying positions. One study found that female physicians' midlife career achievement was influenced by motivational and personality factors shaped early in life (Graves & Thomas, 1985). Next, several studies are reviewed that examine the factors that influence physician income other than the choice to earn less.

Factors Affecting Physician Income

The earnings gap for physicians was first reported by Keher in 1976. Kehrer found that the characteristics of female physicians' professional status that were less helpful to their careers

than those of males physicians are: specialty, board certification, and choice of entrepreneurial or salaried practice all tend toward lower incomes; those choices could be influenced by prior discrimination or social conditioning that treats females and males differently. That study also found that lower annual incomes amongst female physicians often resulted from fewer hours worked, in part explained by family and household responsibilities and also by social pressures. Controlling for the number of years in practice, age, board certification, compensation structure, medical school choice (if outside of U.S.), children under 6 (for female physicians only), county population where practice is located, per capita income in county where practice is located, total hours worked, hourly net income, marital status (married or not), medical specialty and surgical specialty, Kehrer (1976) attributed one-quarter of the income disparity to differences in characteristics and three-quarters to differences in the income structures.

In 1976, Kehrer would not call the inequality between female and males' salaries "discrimination." Instead, she attributed the disparity in income to the effect of structural differences such as how physicians were paid. As a follow-up to Kehrer's study, Langwell (1982) examined whether the income differential could be attributed in part to differences in productivity and to discrimination by patients against female physicians. Whereas Kehrer attributed 28 percent of the income disparity to the characteristics associated with lower vs. higher earnings (i.e. specialty, board certification), Langwell attributed only 13 percent of the differential to these characteristics. Furthermore, Langwell noted that as these differences in characteristics become smaller, structural differences account for a larger portion of the differences in income (Langwell, 1982). Langwell indicated that female physicians could face marketplace discrimination—females' preference for male physicians and male physicians' preference to refer patients to other males. Langwell (1982) concludes that female physicians are

not discriminated against by consumers, but that productivity differences may nevertheless partially explain the income disparity: female physicians schedule fewer patients per hour than males do, thus sacrificing some portion of hourly income. (Langwell assumed that the quality of females' and males' service is constant.) Overall, Langwell found that female physicians see 38 percent fewer patients per hour, yet make 22 percent less income than male physicians do.

According to Lowes (2005), doctors who practice in mid-sized groups, on average, make more money than others. He also found geography to influence income, with the midwest leading the nation, followed by the south, east and west. "Experts surmise that where HMO penetration is lower and doctors scarcer—which is true for many Southern and Midwestern states—doctors are in a stronger position to see more patients and command higher fees" (Lowes, 2005, 23). In Lowes' study, he found that males still earn more than females in medicine, but that females' income is rising.

A 2000 study found female physicians were underrepresented in rural areas (Doescher, Ellsbury, & Hart, 2000). The researchers assert that unless female physicians are recruited and retained in rural areas, the shortage will not be resolved (Doescher et al., 2000). A study of a program in Florida for recruiting primary care physicians to rural areas found physicians were likely to locate and specialize where they could get the best pay and perquisites, including non-pecuniary benefits (Fournier & Henderson, 2005). A 1998 study in California found an overabundance of specialists, but a trend moving toward gender parity with physicians and the state population (Grumbach, Coffman, Young, Vranizan, & Blick, 1998). A study of internists in Pennsylvania found that female physicians were more likely to have the least lucrative practice arrangements and be in low-paying specialties, were less likely to be a partner in the practice, and were more often salaried employees; females also spent fewer hours per week seeing

patients (Ness et al., 2000). Even after adjusting for these differences, however, hourly earnings were significantly higher (by 14 percent) among males than among their female colleagues. Males' earnings significantly exceeded females' earnings among those physicians with no academic affiliation, those in high-earning specialties, and those in general internal medicine (Ness, 2000).

In 1996, a study using the 1991 Survey of Young Physicians reported that male physicians earned 41 percent more per year than female physicians, but after controlling for specialty, practice setting, and other characteristics, no significant difference in earnings was found (Baker, 1996). Rather than interpreting these results as evidence of the abolishment of discrimination, however, the study suggests that perceived or real limitations of opportunity may effect income differentials. Baker (1996) finds greater income equality in health maintenance organizations and large group practices, and predicting that the increasing demand for female physicians will promote equality of income. Hoffman (2001) reported it would be increasingly difficult for doctors working for large organizations to boost their incomes as productivity standards become more stringent.

Fifteen years earlier, using a more robust model, researchers showed that in 1982 female physicians earned 12 to 13 percent less than male physicians, which they attributed to discrimination and unexplained factors (Ohsfeldt & Culler, 1986). They noted that as females continue to gain experience, experience distributions converge, and also females' perceptions that returns are greater in specialty areas is an incentive for them to specialize. The authors believe that the unexplained differences call for more complete specification of the income equations and more accurate calculation of the unexplained income differentials.

A recent study reveals that in family practice females earn eight percent more than males, and also that females choose specialties in internal medicine more than males (Bhattacharya, 2005). Bhattacharya (2005) concludes from females' specialty selection that for physicians in surgery and radiology specialties discrimination could explain wage differences. Looking at race and foreign medical school graduates and U.S. medical school graduates, Bhattacharya finds no evidence of racial discrimination, since minority physicians earn more than whites in four out of the five specialties he studied. Foreign medical graduates are less likely to choose surgery, but Bhattacharya rejects discrimination unless that would explain why there are fewer U.S. medical school graduates in generalist specialties.

Males are more likely to practice in lucrative specialties. They are found to earn more money even when workload, specialty, and hours worked are controlled (*Gender discrimination*, 1994). In a study of physicians in a relatively new specialty, hospital medicine, annual compensation was used as the dependent variable and demographic, work, and nonwork variables were predictors. Controlling for marital status and career choice, the study found that the gender effect on income was significant (Hoff, 2004). Although the research showed that several of the predictor variables were statistically significant, the findings could not explain the observed difference in compensation between females and males. Moreover, the longer the hospitalist had been in the role, the greater the pay inequality (Hoff, 2004). This means when physicians first enter practice, wages for females and males are more equal than is seen as their careers progress. For example, a female physician and male physician each with 25 years of experience, and with other variables substantially equal, will find that the male earns more. Two physicians in their first jobs, all variables substantially equal, are more likely to earn close to equal pay then at any other time in their careers. That finding can be attributed to employment

gaps and cumulative years of experience, as well as to the glass ceiling that females hit as their careers progress. Financial incentives are often used to reward physicians, accounting for an average of about 15 percent of total physician pay (Hoffman, 2001). Incentives vary for specialists and generalists, with primary care physicians most often being rewarded according to patient reported satisfaction, net revenue brought in, and total number of patient encounters per time period. Specialists are most often rewarded according to gross revenue and net revenue brought in, and patient reported satisfaction (Hoffman, 2001). Practice type also affects incentives.

An older study on the effects of the organization of the medical practice on primary care physicians' net incomes found being female to have a significant, negative effect on income (Wolinsky & Marder, 1983). A later study reported that females make $22,000 less than males, when controlling for multiple factors in a nationally representative sample (McMurray et al., 2000). These researchers explained 26 percent of the variance in income by these variables: age, minority status, specialty, practice type, time in current practice, Medicaid or uninsured status of patients, regional salary variations, ownership status of practice, number of hours worked per week, and proportion of hours spent in hospital-based activities. Income differences were found among younger physicians. Gender differences were found in five areas: income, patient mix, time pressure in patient visits, control of daily work life, and burnout. Interestingly, in another study, "Gender was not related to career satisfaction. Gender differences in both work effort variables were statistically significant. Male physicians had a higher proportion of gate-keeping patients and lower average earnings per week than did female physicians, when the effects of other predictor variables were controlled" (Wan, Lin, & Wang, 2004, p. 18). A study showed that income was not related to changes in specialist satisfaction, but that changes in job

satisfaction among primary care physicians were significantly related to income (Landon, Reschovsky, & Blumenthal, 2003). Yutzie et al. (2005) reported that female and male general surgery residency graduates are equally satisfied with their careers. However, discrepancies between the two genders still exist, with more females working fewer than 40 hours, and a disparity in income for non-fellowship-trained surgeons that favors males (Yutzie, Shellito, Helmer, & Chang, 2005).

The profits of a practice certainly affects income. Those practices with high liability and high insurance may not even profit. Solo practices have more risk and, one might expect, less profit. Specialists generate more profits than PCPs with fee-for-service rather than capitated payments from health plans to medical groups. Specialty groups have incentives to contain costs and lower the overall cost of care by operating efficiently (Casalino, Pham, & Bazzoli, 2004). Physicians are being forced to be more like business people, and policymakers now focus on aligning physicians' financial interests with the goals of cost control and quality (Anonymous, 2004; "Study points to drop in average physician income," 2003). Physicians in groups of five to nine have the highest median net incomes; those in single-specialty groups rather than multi-specialty groups netted more profit (Crane, 2001). In the CTS, surgeons in solo or two-physician practices report that income pressure and limitations on clinical freedom and patient continuity compromised the quality of care. Surgeons reported that clinical decisions made in the interest of their patients reduced their income (Sturm, 2002). This study did not differentiate by gender; however, it is known that females are less likely to be surgeons. Managed care has been shown to reduce physicians' income (Reed & Ginsburg, 2003). Physicians are less likely to accept Medicaid patients than to accept patients with other sources of payment (Tucker, 2002). That disturbing find means that with millions of Medicaid-eligible patients in the U.S., if physicians

choose not to accept them because they bring less income, access to health care by the poor is limited. One hopes that problem will get the attention of policy makers (Tucker, 2002). One study found that changing payment schedules to increase physicians' incomes so as to attract them to particular specialties may be ineffective (Weeks & Wallace, 2002b). Using the Gini Coefficient, researchers found unequal distributions of physicians in the U.S. (Horev, Pesis-Katz, & Mukamel, 2004). Citing Kaplan et al. (1996), Horev et al. also notes that those states with greater inequality in physician distribution have higher violence rates, more people without insurance and with disabilities, and less investment in education and literacy—forces that may influence physician and hospital bed distribution.

High paying specialties are said to drive the health care dollars, as doctors in fields such as surgery demand high salaries. Professional skills can demand more pay with technological advances; physician group owners whose practice can afford to invest in new medical equipment are rewarded with more profits (Moon, 2004). A study of medical school students and their scores on a scale for Machiavellian personality traits found that males scored higher than females. High scores for such traits correlated with reliance on high-tech medicine, being externally controlled, intolerance of ambiguity, and authoritarianism (Merrill, Camacho, Laux, Thornby, & Vallbona, 1993). Perhaps having such traits as a physician is associated with higher income, especially since Machiavellianism connotes a tendency to manipulate others for social gain.

Recent studies controlling for workload, age, and practice type have found that female physicians continue to earn less than males (Carter, 2005a; Ness et al., 2000; Wallace & Weeks, 2002). Carter found for family practice physicians, the strongest influence on income was the number of patient visits per physician, followed by practicing in a hospital setting and in a large

practice. An analysis by the American Academy of Family Physicians (AAFP) found that the best predictors of high income (for AAFP members) were number of office visits, being male, and providing obstetric or emergency services (Carter, 2005b). For other factors examined in a survey of the readers of *Medical Economics*, Tolkoff (2005) found that one in four female physicians were not married, compared to one in ten for males. Eleven percent of female physicians reported working 20 hours or less, whereas only seven percent of males reported working part-time (Tolkoff, 2005).

Some studies from five or ten years ago found 84 percent of female physicians to be generally satisfied noted the "paradox of the contented worker": females with relatively less pay, lower status, and little authority describe themselves as satisfied for other reasons than concern about pay and prestige (Frank, McMurray, Linzer, & Elon, 1999; Mueller & Wallace, 1996; Phelan, 1994). A recent study with a national sample, however, found a positive association between income and job satisfaction and no differences by gender (Leigh et al., 2002). Using the Community Tracking Study, however, researchers found that female physicians were found to be significantly less satisfied than their male colleagues with the time they were allowed to spend with patients. For primary care physicians, gender differences were explained by physician attributes, practice characteristics, geographic location, and patient profiles, whereas, for specialists, control variables explained the gender gap (Boulis & Jacobs, 2003). One study, only, found males to earn less than females in medical practice; the exception was family practice physicians (Wan et al., 2004). Much research does show females earning less, or researchers conclude that gender has no influence on pay.

Medical students in training are influenced by those from whom they learn. Therefore, it is essential that academic medicine set the expectation for gender equality in physician incomes.

Despite all the studies done in academic medicine, they have generated little progress toward that goal.

Females in Academic Medicine

Although the sample for this study does not draw from the group, income inequalities among academic medical professionals have been often studied (Brown et al., 2003; Carr et al., 2000; Carr, Szalacha, Barnett, Caswell, & Inui, 2003; Colletti, Mulholland, & Sonnad, 2000; Dresler, Padgett, MacKinnon, & Patterson, 1996; Kaplan et al., 1996; Laine & Turner, 2004). These studies guide this research in the selection of variables, especially choice of specialty. Laine and Turner (2004) cite a 1996 study that attributed the gender gap for earnings in academic medicine to specialty choice; their editorial in the *Annals of Internal Medicine* disputes that finding. They warn, "One might falsely conclude from this evidence that women in medicine are earning less by choice, but ample evidence, including the article (Ash & Carr, et al., 2004) in this issue, shows that women earn less than men, even after adjustments for hours worked, specialty, job responsibilities, and productivity" (Laine & Turner, 2004, p. 238). A different 1996 study found that when adjusting for academic productivity, distribution of work time, institutional support for research, family responsibilities, and career attitudes, females were shown to attain academic ranks similar with males, but not similar salaries (Kaplan et al., 1996). Kaplan et al. assert that their findings, in line with a study of faculty at universities, suggest "pervasive prejudice against women" in academia. One recent study of academic medicine reports that specialty, practice style, seniority, hours worked, and number of peer-reviewed publications explain some of the salary differential where females are paid less than their male counterparts

(Ash et al., 2004). In a focus group study, female faculty in medicine, in their definition of gender bias and gender discrimination, included lower salary and slower advancement (Carr et al., 2003). Females in the study received less salary than their male counterparts, and some attributed it to their not being viewed as the breadwinners (Carr et al., 2003). The authors report, "They see gender discrimination as 'pervasive, institutionalized, and culturally ingrained" (p. 1013). In a study at one medical campus, female faculty were reported to earn 11 percent less than males, and one-third reported being discriminated against (Wright et al., 2003). This study concluded that gender differences in salary are not attributable to discrepancies in productivity or commitment (Wright et al., 2003).

In Sonnad's study (2002), almost a quarter of the female physicians in academic medicine who were surveyed reported that they were considering leaving the profession. Although no particular reason emerged from the data, females reported these: an unsupportive atmosphere, stress, salary, too heavy a clinical work load, and conflicts with family responsibilities, as reasons that would influence them to leave academic medicine (Sonnad & Colletti, 2002). The study's sample of female physicians also reported encountering gender-based obstacles to career success: in "standards, mentoring, collaborative research opportunities, informal networking, and academic attitudes" (Sonnad, 2002, p. 416). An earlier study of cardiothoracic surgeons found gender differences in salary, promotion, and perceptions of discrimination (Dresler et al., 1996).

Carr et al. (2000) found that female medical faculty were 2.5 times more likely to report gender-based discrimination than were their male counterparts. Since primary care has a higher proportion of females, it is not surprising that it is in other specialties that females are more likely to report harassment. The authors note that specialties value hierarchy, traditional

hegemonic structures, and authority. Institutional gender bias is perceived among female faculty in academic medicine who have been sexually harassed (Carr et al., 2000). In a 2005 address reported in Colletti et al. (2000,) Wolfe reports remarkable differences in academic representation, specialty selection, and income between the sexes and concludes moreover that "attitudes, behaviors, and long-ingrained traditions of how we structure work and evaluate faculty participation in academic medicine will be more difficult to change than the formal and obvious inequities in pay and other types of support" (Colletti et al., 2000, p. 977).

Authors of one study that showed high levels of satisfaction for medical faculty warned that as role models they may create inappropriate career expectations for the females they mentor (Frank et al., 1999). Other researchers, however, found students not to be influenced by role models and therefore suggested a mentorship program especially for females to attract them to surgery (Azizzadeh et al., 2003). One study shows that medical students encounter their role models before making their specialty choices (Basco & Reigart, 2001), meaning role models can indeed influence specialty choices. That would make it all the more important for females to be represented on medical school faculties. Medical school administrators should ensure that students are exposed to faculty not only from all specialties, but of both genders. It is clear that females in academic medicine not only are paid less, but also are not likely to advance at the same rates as males. The role of academic medicine is in part to train future physicians, and it is critical that the precedent for lower pay for females does not begin there.

Effect of Specialty Choice

A 1978 study used multiple discriminant analysis to predict the selection of general practice and family medicine specialty by using data on admissions, medical training, and practice as predictor variables (Watson & Croft, 1978). Interestingly, this study did not use gender as a predictor variable. Furthermore, the authors included a question regarding how a student expected to finance medical school with one response being, "Wife working (0—not indicated, 1—indicated)." Husband working was an option these authors were unaware of; indicative of males dominating medical school enrollments at the time. Since 1978, research on specialty choice and gender differences has evolved to include gender differences, how they are derived and explained, and recommendations for resolutions.

As one might expect, different medical specialties have different pay scales; that often is defended by, for instance, the fact that some specialties such as surgery require three to five years additional training. The physician's choice of specialty is often cited as a reason for income disparities. For instance, females choose pediatrics more often than males do. Pediatricians earn less than neurosurgeons, and males are more likely to choose neurosurgery as a specialty. Some studies differentiate between primary care (PC) and non-primary care (NPC) physicians and show that NPC doctors earn more. PC requires a shorter residency, and NPC leads to substantially higher earnings over a lifetime (Bazzoli, 1985). However, in Bazzoli's study, neither graduating from a foreign medical school or gender had a significant effect on specialty choice. Weeks and Wallace (2002) find that the financial returns on additional specialty training are consistently less for primary care medicine, although declining for all specialties. An important question that their study fails to consider is whether the greater changes in returns

could be attributed in part to gender differences in the choice of specialty and particularly that higher proportion of females in PC. It was reported in 2001 that five-year median pay rose 13.86 percent for specialists and only 7.98 percent for primary care (Hoffman, 2001).

Studies have shown that socioeconomic status may effect specialty choice. Bazzoli (1985) found that potential earnings have little effect on the choice of specialty, but that personal background such as the educational attainment of parents and marital status do affect choice between PC and NPC. Socioeconomic status is noted as a potential factor by (Kiker & Zeh, 1998), since specialization may be an easier option for those of greater wealth. More residents are now pursuing greater specialization, which in part may be attributable to the lower compensation in primary care as well as lifestyle differences and expectations of professional satisfaction (Brotherton, Rockey, & Etzel, 2004). Despite the added debt burden it implies, however, females are more likely to choose primary care (Frank & Feinglass, 1999). Those medical students with lower socioeconomic status may choose to specialize to increase family wealth. Physicians in a sample of dermatologists reported they worked fewer nights on call, were less stressed, were more satisfied with their careers, were less likely to report being overworked, and had relatively high household incomes (Frank & Singh, 2001). Such factors could be important when medical students are deciding to specialize. Noting that residency positions are rationed, Nicholson (2002) used the preferred and the realized specialties for 7,200 medical students and showed that students are influenced by the expected income differences between specialties. Policies that lead to increased pay for primary care physicians might address shortages there (Nicholson, 2002). Another study (Weeks & Wallace, 2002a) found financial incentives to make primary care an attractive specialty were not effective, but nevertheless should be included in health care reform.

Financial aid, insurance costs, demographics, academic and lifestyle factors all influence specialty choice. Malpractice insurance threatens to cancel the rise in physician income and earnings are often tied to productivity (Moon, 2004). Income expectations encourage specialization and discourage PC selection, but anxiety about malpractice insurance encourages selection of PC (Kiker & Zeh, 1998). These authors suggest that policies to encourage medical schools to admit females, married students, and those from poor families would improve selection of PC and be a cost-effective way to balance the physician workforce. A more recent study attributes the waning selection of PC to reduced career satisfaction and the reduced income in comparison to other specialists (Newton & Grayson, 2003). A 1995 address (Kornstein et al., 1998) noted that females enter medical school at a later age, and are more likely to enter into primary care. Kornstein conjectured that females put less importance on income and choose specialties for their high patient contact and better working hours, and where females feel more accepted: pediatrics, obstetrics/gynecology, psychiatry, family practice and internal medicine.

A survey at one university of fourth-year medical students interested in surgery found prestige and career opportunities positively correlated with the specialty choice (Azizzadeh et al., 2003). For some time now it has been demonstrated that income has an impact on specialty selection (Bazzoli, 1985; Kiker & Zeh, 1998). Those authors also identify factors deterring selection of some specialties: lifestyle and work hours during residency as well as the quality of patient/physician relationships. Kiker and Zeh (1998) identify several factors that influence specialty choice: income, length of residency, demographic characteristics, MCAT science scores, predictable working hours, perceived prestige of the specialty, type of medical school attended, and geographic location of the planned practice. One survey found that median compensation for physicians was higher in the south than the east, midwest, and west often

associated with less competition (Hoffman, 2001). Another study in the same year, however, found midwestern and urban physicians to earn more (Crane, 2001). One article suggested that new physicians join a midsized group in the south for the greatest profit (Azevedo, 2001). Medical malpractice premiums have a negative impact on the supply of physicians in a state but physician salaries have no statistically significant effect, according to one study (Gius, 2000).

Choice of specialty can significantly effect the adequacy of the physician workforce, and with females making up almost 50 percent of medical students, attention must be paid to how they choose a specialty. With a need for primary care physicians identified ("The U.S. primary care physician workforce: Persistently declining interest in primary care medical specialists.," 2003) health administrators must consider how to meet it. Although Newton and Grayson (2003) report more student interest in obstetrics/gynecology and less in surgery, they do not attribute those results to the increase in females entering medicine. Nonetheless, obstetrics/gynecology is predominately a specialty selected by female physicians, whereas orthopedic surgery is dominated by males (Brotherton et al., 2004). These authors identify specialties that are increasing the number of female graduates who enter, and attracting fewer males are dermatology, family medicine, internal medicine, obstetrics/gynecology, ophthalmology, pathology, psychiatry, and general surgery. Recently, the largest increase in females was in obstetrics/gynecology, with 31.3 percent fewer male graduates and 18.2 percent more female graduates entering. Even so, fewer females continue in specialty training, and they are more than twice as likely to be unemployed. Although females are equally likely to obtain academic positions upon graduation, males continue to outpace females in advancement, most notably in general surgery but also in obstetrics/gynecology (Brotherton et al., 2004).

Specialty certainly influences income, but female physicians may also choose particular specialties to benefit their lives beyond career aspirations. One 1997 study found that dermatologists are more likely to be married, whereas emergency physicians and surgeons are least likely to be married or ever to have married. In addition, surgeons were found to be least likely to have children or to have the fewest children (Frank, Rothenberg, Brown, & Maibach, 1997). Females may perceive that lifestyle as a sacrifice.

With the need for balancing the physician workforce, attention needs to be paid to the association between professional satisfaction and the number of physicians choosing primary care. One study, (Frank et al., 1999) examined the personal characteristics that most correlated with physicians being satisfied with their specialties: young age, being bisexual or homosexual, being less stressed at work and at home, practicing in medical schools, less history of harassment, and high control of work lives. Females in dermatology, surgery, ophthalmology, psychiatry, and anesthesiology were more satisfied than those in other specialties. High dissatisfaction for females was reported by general internists and radiologists. A more recent study with a national sample found geriatric internal medicine, neonatal-perinatal medicine, and pediatrics significantly more likely than family medicine to be very satisfying (Leigh et al., 2002). This study found otolaryngology, obstetrics/gynecology, and internal medicine to be significantly more likely than family medicine to be dissatisfying (Leigh et al., 2002). Another study found specialty, gender, and age to have no association with PCP turnover (Buchbinder, Wilson, Melick, & Powe, 2001). "The lesser likelihood of physicians aged 30 to 40 years wanting to change their specialty may be attributable to the greater opportunities now available for women in historically male-dominated specialties from which older women graduates may have been excluded" (Frank et al., 1999, p. 1423).

Federal Title VII grants for family medicine departments are intended both to increase the numbers of family and primary care physicians and to increase service to rural and underserved communities. Although the grants were found to be important for U.S. physician workforce policy in that graduates of schools with Title VII grants were significantly more likely to become family physicians and practice primary care, gender has not been considered in their administration (Fryer et al., 2002). Failing to asses the different experiences met by females and males is a policy shortcoming in addressing issues about medical workforce supply, and especially so when females are now entering medicine at almost the same rate as, or higher than males'. Referring to the Census report that female physicians earn less than two-thirds the income of male physicians, Brotherton (2004) states, "In addition to clinical productivity, this finding may stem from differences in income by specialty and changing work habits of younger physicians, since women in practice are younger" (p. 1036). Females are more likely to choose primary care, and one study noted the following factors associated with high-earning primary care physicians: seeing more patients; practicing the full scope of family medicine in a hospital setting; working in a large practice where other services are offered in-house; having in-house billing and collections; seeing more Medicare patients; working more; and being paid based on productivity (Carter, 2005b). Health care reform must take into account the financial returns and incentives both for specialties and for primary care, and the problems of significant gender disparities to achieve balance in the supply of U.S. physicians.

Many of the studies noted here have attributed the physician wage gap to choice of specialty, although specialty choice does not fully explain the income gap. The second hypothesis for this study: that physician specialization is an important factor explaining the income gap between female and male physicians, is informed by that literature. The latent

construct for specialization goes beyond simply a specialty category, to provide an improved measure of the effect on income. Technological advances have been known to increase the earnings of specialists more than of PCPs (Reed & Ginsburg, 2003). By considering specialization with several variables including information technology use and access, this study goes beyond the superficial account of specialty as the explanation of the income gap between female and male physicians. Given such disparities between specialty areas, let alone between females and males, this study isolates specialization to measure accurately its importance in explaining the income gap. Other variables will be controlled and measured in order to answer the third hypothesis: the importance of other factors in explaining gender disparities in physician earnings.

The "Glass Ceiling"

Part of the gender income disparity could be explained by females not rising to top positions that pay more and not moving into practice ownership which yields higher income. Some studies report a "glass ceiling" for females in academic medicine. Back in 1996, Baker acknowledged that gaps remained in some specialties and among older physicians, perhaps an indicator of the "glass ceiling," and warranted further investigation (Baker, 1996). Bickel (2000) found that of female medical faculty members, only 11 percent are full professors. The reasons given for females being less likely to assume top ranks and leadership positions in academic medicine include females' choices, sexism, cultural stereotypes, family responsibilities, and lack of mentoring (Bickel, 2000). In a 2004 national study, Ash et al. examined inequality in promotion and salary among medical school faculty. "After accounting for the major

professional factors that effect salary and advancement, substantial deficits for females and minorities remain; it is not obvious that additional legitimate factors, rather than discrimination, can account for these discrepancies" (Ash et al., 2004, p. 210). Attributing part of the salary gap to females' poor negotiation skills (as reported by Babcock, 2003), Laine and Turner (2004) challenge those in charge of academic medical institutions across the country to take responsibility for that obstacle, as well. "When women's work is consistently treated as less valuable, is underpaid, under-rewarded, or otherwise designated as less competent, women become discouraged and have a lower level of self-esteem and career ambitions" (*Gender discrimination*, 2004, p.5).

Discouragement and open hostility against women can force them to leave their specialty or the profession of medicine altogether. One report shows females in medicine who choose to have children often sacrifice promotion and career opportunities (Weiss, 2005). The author attributes the lower number of females on medical boards and as chairs of departments to their willingness to conduct a life outside of work, and thus having insufficient time for committee work. However, Weiss anticipates change as females in medicine become older and as the number of females in the profession continues to rise. Stoddard et al. (2001), when measuring career satisfaction, identified income relative to peers as a strong indicator. The authors controlled other factors known to influence income: specialty, years in practice, work effort, gender, and employment arrangement. Females in academic medicine are promoted more slowly than males even after adjustment for productivity factors (Tesch, Wood, Helwig, & Nattinger, 1995). With the "glass ceiling" effect and females relatively new presence as medical professionals, bias and discrimination will undoubtedly continue if equality in advancement and salary of physicians is not given due attention.

Summary

No study asserts that gender disparity in physicians' income can be attributed primarily to discrimination or institutional bias. This study aims to test whether in fact female physicians make less than males as a consequence of discrimination and bias, with other factors being simultaneously considered. A review of the history of American females and an exploration of feminist and social justice perspectives provide a unique framework for this research. "The disparity between the ideology of a democracy that offers equality to all and the existential reality of the subordination of women and other minority groups creates a tension not easily dismissed" (Lipman-Blumen, 1984, p. 203). Phelan (1994) reports that gender equality in the workplace remains a distant goal. Perhaps continued research will further support the need for policy changes to provide females equal pay for equal work.

To shape future research efforts, this study will identify how factors differ in relative importance in explaining the income gap between female and male physicians. The third and final hypothesis measures how factors affect females and males disproportionately, and how these factors explain the gender wage gap in physicians' income.

The aforementioned literature clearly defines variables to be considered in this study, including control and contextual variables. For instance, it can be deduced that hours worked is more likely to affect the income of females than that of males. Not choosing to enter primary care is expected to influence males more than females. Number of years in practice is important to consider with females being constrained by the "glass ceiling." The literature demonstrates that practice type, job satisfaction, marital status, and number of children clearly have some bearing on the wage gap. With females entering medical school later, age is also an important

factor. This study will add to the literature by showing which variables explain the income gap between female and male physicians.

CHAPTER THREE: THEORETICAL FRAMEWORK

Social justice and feminist perspectives provide a framework for this study, which seeks to explain and predict the gender gap in physicians' income. Equal pay for equal work is considered just. From a feminist perspective, there should be no differences based on gender in earnings for equal work.

Social Justice

Miller (1999) writes, "Social justice often has to do with the relative value of the advantages received by different people" (p. 8). He also notes that what we have is often the result of personal decisions which should reflect free choice and not factors such as economic constraints (Miller, 1999). It is difficult to understand why female physicians continue to make less money than males with other factors being substantially equal. There appears to be a lack of distributive or social justice in medicine. Considering the number of published studies on the gender gap in wages, it appears one must ask whether females have pressed rigorously enough for their just due. Feminists would argue it is time to do so.

Perhaps the causal arrow runs from beliefs about justice to the distributive outcomes observed in society (Miller, 1999). If this were the case, it would be justified to pay females less money if indeed their work were considered of less value, of less quality or requiring less effort. However, if society believes in equal pay for equal work, then the distributive outcome that allows less pay for females' equal work is indeed unjust. Miller's (1999) pluralistic theory includes desert-based principles that prescribe distribution according to desert. Although inequalities may occur, Miller finds the wage gap that affects a majority of females to be, indeed,

unjust. Injustice to a large group is essentially unacceptable. Distributive justice is based upon one's experience in one's own social position, relying on certain intuitive principles, one may label one's place as "unjust." The social justice perspective calls for lifting the Rawlsian veil of ignorance behind which males continue to earn more, as though females are ignorant of their own lot or lack the intuition that less pay for equal work is unjust.

Chatterjee explained that in industrialized society the female role, being gender-based, often requires special protection including in situations where "women are often paid less than men even when they do the same work" (Chatterjee, 1999, p. 132). "For equal opportunity is a moral requirement, and moral requirements are those that are reasonable for everyone to accept" (Sterba, 1995, p. 76).

Equality does not denote sameness and Sapiro (1990) warns that an egalitarian approach itself might lead to injustice if females' unique protections were lost and they became more overburdened. What should change is the androcentric social structure that operates systemically to preserve male power (Bem, 1993). The perception that employees actually are rewarded according to their productivity is weakened by Ferber and Spaeth's (1984) finding that workers who report to a male as immediate supervisor earn more than do those who report to a female. The authors contend that male gender confers higher status on an otherwise comparable job. The authors also show that control over money in the workplace is rewarded more highly for males than for females, indicating the existence of discrimination (Ferber & Spaeth, 1984). Miller, in his book *Principles of Social Justice*, reports that the view: "jobs with equivalent content should receive equal pay, regardless of who does them or in which economic sector (public or private, for instance) they work," is a universally agreed-upon norm (p. 83). If physicians' jobs are

equivalent in nature, then one would expect that females' and males' earnings would be equal and, hence, just.

One difficulty is that in many occupations, "productivity" is not easily defined or measured or universally agreed upon. Nevertheless, social justice theory can specify that when education, skills, and ability are the same, and productivity can reasonably assumed to be the same, females and males should earn equal wages.

Chafetz (1997): "One exception [to such a view] is Collins (1990), who suggests several interesting ideas about how to theorize 'one overarching structure of domination' that includes age, religion, and sexual orientation in addition to race, class, and gender" (p. 222). Chafetz argues that people can simultaneously be oppressed and oppressor, privileged and penalized; that no one form of oppression is primary, although individuals and groups often define one as more fundamental and others as lesser; and that the matrix of domination has several layers (e.g. persons, group or community culture, social institutions), all of which are sites of potential resistance to domination. Moreover, Chafetz writes, "different systems of oppression may rely on varying degrees of systemic versus interpersonal mechanisms of domination" (pp. 226–27).

Social justice theory relies upon the notion that state policy establishes distributive justice by taking into account the concepts of citizenship, justice and desert. In the case considered here, distributive justice considers how income is distributed to females and the basis for distribution that by law should be equal. England (2004) emphasizes how feminists studying the state have asserted that the supposedly gender-neutral notion of citizenship in actuality is gendered, yet in order to benefit from the state, one must be considered a citizen. Liberal feminists assert the need for state action to achieve equality of opportunity by class, race, and gender (England, 2004).

Liberal thought dichotomizes public and private spheres, with justice applicable only to the public sphere (England, 2004).

Often the terms desert and deserve are used interchangeably, with the notion of desert depending on performance but not its motive (Miller, 1999). One view of justice can be understood in terms of desert: everyone gets what he or she deserves. A pluralist view considers not only what people deserve but also what people need (Miller, 1999). Here we argue that females deserve equal pay for equal work. (We could also argue that they need equal pay, especially given the number of females who are single heads of household).

Advocates of equal pay believe it is a principle of justice or fairness, saying pay should be based upon the job performed instead of the family status (Mutari, 2001). A social justice criterion would be that if specialty, age, years of education, and other variables, for example, are equal, there is no income gap in earnings between females and males. "Medicine's future will be greatly influenced by the presence of women, and its future success may depend on a fair inclusion and accommodation of both genders in the medical workplace" (*Gender discrimination*, 1994, p. 9).

Gergen (1999) states "… the hope is to sharpen our critical acumen in the service of emancipation. Public policy, educational practice and other levels of action are influenced by the construction of particular social groups—for instance, woman, man, Christian, Jew, black, white—that are taken for granted as they are shared amongst society. Liberty then is defined as different although not necessarily unequal." Past decisions that were based on gender stereotypes most certainly have an impact on the culture and customs in today's workplace (Reskin, 1994).

Gergen (1999) points out that efforts to define such ambiguous concepts as equality, justice, fairness, democracy, leaves them essentially undefined. Gender, however, is considered a

dichotomous variable as defined by Chafetz (1997): "…a dichotomous conceptualization of gender can be a theoretically meaningful aspect of social structure, such as when one talks about the degree of male-female occupational segregation or the extent to which an ideology devalues females relative to males" (p. 104). This author explains that feminist scholars agree that gender stratification, or unequal and different treatment by gender, is a concept important to consider (Chafetz, 1997). Gender stratification is hypothesized in this study. The feminist perspective, although holding many different perspectives within it, includes consideration of the effect that gender has on social justice.

Feminist Perspective

Feminists have been labeled many things: radicals, socialists, Marxists, existentialists, and liberals, to name a few. This research advances from a particular feminist perspective: that if females receive less pay, it is often because their gender essentially assigns them to positions of less worth than that accorded males. Describing feminist theory as a broad and contested term, England (2004) defines such theories as those that generally refer to female's experience and the subordination of females by males. Riley (1999) states that feminist theory includes these central ideas: gender is an organizing principle in all society that is socially constructed and necessarily involves the politics of inequality. Sterba (1995) argues, "Contemporary feminists almost by definition seek to put an end to male domination and to secure women's liberation" (p. 64). Chafetz (1997) explains that there is no concrete definition of "feminist"; she considers feminist theory a myriad of works. Here we consider two of Chafetz' concepts, not mutually exclusive, that she sees as feminist theory: "normative discussions of how societies and relationships ought

to be structured, their current inequities, and strategies to achieve equity…; and explanatory theories of the relationship between gender and various social, cultural, economic, psychological, and political structures and processes" (p. 97). Citing her earlier work, Chafetz defines feminist theory with four criteria: "(*a*) gender comprises a central focus or subject matter of the theory; (*b*) gender relations are viewed as a problem…. [F]eminist theory seeks to understand how gender is related to social inequities, strains, and contradictions; (*c*) gender relations are not viewed as… immutable; and (*d*) feminist theory can be used… to challenge, counteract, or change a status quo that disadvantages or devalues women" (p. 98). In a somewhat skeptical view, Gergen (1999) argues that feminists (and other groups) have been incited against structural power by the conviction that it is an effort to restore the good since those in power are perceived as evil.

Liberal feminist theory emphasizes equality of opportunity and focuses on females' exclusion from well-rewarded positions (England, 2004). In her introduction to a recent reprint of Mill's *The Subjection of Women*, Ulbrich asserts that this particular work of Mill, "provides the roots of liberal feminist theory in the twentieth century" (p. xiii). Bem (1993) says the feminist goal should not be to facilitate women's acting exactly like men in order to earn what men earn; rather, women should be able to earn what men earn for the same work, while still preserving their concern for the welfare of their own and other children. It was only in the last third of the twentieth century, and after the emergence of new feminist movements, that the laws were gradually adapted to the concept of equal household partners, whatever the extent to which the gendered division of tasks, namely breadwinning and family caring, continued in particular instances (Plett, 2001, p. 5938). Mutari (2001) argues from a feminist economic theory perspective that wages are a social practice that reflect gender as well as class and race.

Socialist feminists argue that sexism can be understood only by examining the historical context of capitalism (Ehrenreich, 2005).From the socialist feminist perspective, class struggle is not confined to issues of wages and hours, but also touches conflicts in health care, education, and family (Ehrenreich, 2005). Not until differences in education, wealth, and power are eradicated would socialist feminists proclaim equality (Jaggar & Young, 1998). Until then, equality of opportunity is the goal, as socialist feminists strive to "level the playing field," not to ensure equal outcomes but for fair competition (Jaggar & Young, 1998).

Feminist theory often recognizes gender as being socially or culturally constructed (Keller, 1989 as reported in Riley, 1999). Arguing for a gender-bias-free or "androgynous" society, Sterba (1995) recommends understanding what females and males have to gain or lose if this ideal were recognized. Achieving equality and equal opportunity would require flexible job schedules and a movement away from male ideals. Sterba argues that affirmative action and comparable worth policies are needed to ensure females receive the salaries they deserve (Sterba, 1995). England (2004) explains theoretical work showing a bias in western thought against the qualities and activities associated with females. She reviews a body of empirical gender research that documents the low value and reward given to activities associated with females, and mentions in particular research associated with comparable worth policy. Feminist economists have argued that employment discrimination derives from a system of social organization that considers females subservient to males (Bergmann, 1987, as reported in Figart, 1997).

Chafetz (1997) notes, "Together, feminist versions of rational choice, exchange, status expectations, and network theories emphasize the importance of sociocultural structure for understanding the gendered nature of interaction and individual choice, and the patterned gender differences and inequalities that result from such interactions and choices" (p. 111). England

(2004) offers this basic summary: "The traditionally female characteristics that cultural feminists believe our culture has undervalued include nurturing, nonviolence, emotional sensitivity to the feelings of others, unselfishness, kinship with rather than domination of nature, acceptance of our physical bodies, humility, flexibility rather than rigid adherence to abstract principles, and intuition of wholes" (p. 5912). It is interesting to note that many of the characteristics listed could be considered essential in providing high-quality health care.

Bem (1993), writing about responses to protections unique for women, notes this debate: "The feminist resisters think special protection homogenizes women too much and reinforces the old sexist stereotype that women as a group are inherently incapable of competing successfully with men until and unless special provisions compensate them for their special needs. The nonfeminist resisters, on the other hand, see no justification for making special arrangements to help a group whose economic and political disadvantages derive not from discrimination but from their own decision to invest time and energy in their children, rather than in their careers. As these nonfeminist resisters see it, to prevent employers from doing harm to women through outright discrimination makes sense, but to mandate that employers make special arrangements to help women in a marketplace that is not discriminatory does not" (p. 180). The last eight words in Bem's account of course reveal an assumption that feminists dispute.

England explains feminist theory as including 'positive' and 'normative' claims, with the positive claims defined as descriptions and explanations of how gender-oriented systems work. The claims are the conceptual and theoretical part of empirical gender studies. She explains that normative claims answer philosophical questions about what gender arrangements should be, thereby answering questions of ethics and social justice (England, 2004).

Although females have made some practical gains, gender pay equality in the U.S. for the medical workforce as well as others could set the standard in other parts of the world as well. With converging theories, the present study is guided by the perspectives of feminism and social justice whereby the wage gap should not be justified by gender.

Summary

Ehrenreich (2005) notes that although capitalism is said to have disrupted the patriarchal organization of production and family, male supremacy continues. Feminists seek an understanding of females' place in society, but that is not done without raising issues of justice. Socialist feminists, from a dual systems approach, identify capitalism and patriarchy as forces of social power that are in conflict (Jaggar & Young, 1998). Eliminating class differences between females and males, and perhaps thus eliminating pay inequality, a socialist model of equality would be achieved (Jaggar & Young, 1998). Whatever may be the variety in feminist philosophies, the perspective in this study is that gender should not influence income. This particular feminist stance is driven by social justice. Social justice explains the income gap whereby more vulnerable populations would receive less distribution of income. This study reveals factors that predict increased vulnerability such as gender and identifies a more vulnerable group that would be expected to earn less income. From the feminist perspective, regardless of other confounding variables gender alone can explain the vulnerability of a group and predict unequal treatment such as the income gap. Combining social justice and feminist perspectives, if gender explains vulnerability and hence predicts an income gap, a just nation should resolve the inequality for female physicians.

CHAPTER FOUR: METHODOLOGY

The purpose of this study is to formulate a model to explain the income gap by gender among physicians, using a national sample. This chapter outlines the methods and procedures used to evaluate various factors and their influence on the income gap and includes: (1) Research Design, (2) Sample, (3) Procedures, (4) Instrumentation, (5) Data Analysis.

Research Design

Research studies thus far have not explained the persistent gender differences in income for physicians. With the medical profession exhibiting greater salary disparities than any other profession in the U.S. (Weinberg, 2004), this study aims to identify whether the income gap persists over time, using three waves of data, and which factors predict the income disparity between female and male physicians. Advanced statistical modeling may allow explanation of the income gap by gender beyond simply the factors of specialty choice and hours worked, the factors most researchers use when seeking to explain income differences (Bazzoli, 1985; Kehrer, 1976; Ohsfeldt & Culler, 1986).

The research design for this study was largely based upon the availability of a national data set that includes physician income. A large sample size gives the analysis enough power to perform modeling of the income gap by gender. The Robert Wood Johnson Foundation funds the Community Tracking Study (CTS), a large-scale longitudinal investigation of health system change and its effects on people. The CTS, in part, explores physicians, their systems, and the forces driving organizational change. It is the core research effort of the Center for Studying Health System Change (HSC), a nonpartisan policy research organization in Washington, D.C.

In order to foster change toward income equality, detailed assessment of the factors influencing the disparity is necessary. Use of the CTS may allow just that.

The CTS collects information through nationally representative surveys. The CTS Physician Survey is administered to more than 12,000 practicing physicians via phone interviews. The first three rounds of data for the Physician Survey are currently available (1996-1997, 1998-1999, and 2000-2001). The Physician Survey was conducted again in 2004-2005, but those data are not yet publicly available. Archiving the CTS allows secondary analysis from which many important research studies have evolved. For this study, secondary analysis allows use of data from a national sample without the researcher incurring the time and expense such a survey would entail. There is extensive documentation, including code books and technical publications, for the CTS Physician Survey. The information presented here provides the necessary detail to understand the framework for this study. (Further information can be found at the Center for Study Health System Change (HSC) website: http://www.hschange.com.)

The interviews for the CTS were conducted for the Center for Studying Health System Change (HSC) by the Gallup Organization. Mathematic Policy Research, Inc. was also contracted to track physicians who could not be located as well as to provide the sample design, variance estimation, and weighting (*Community Tracking Study Physician Survey, 2000-2001*, 2003). Using such a large survey research organization means the telephone surveys can be conducted rapidly and costs can be reduced (Singleton & Straits, 1999). The disadvantages of telephone interviews, such as not sampling those with unlisted numbers or those without telephones, were not a primary concern for the physician population. One benefit of the interview survey is that this method tends to produce fewer unanswered or incomplete responses (Babbie, 2001), although some argue that it is difficult to establish trust over the phone, which

may lead to underreporting of sensitive or socially undesirable behavior (Singleton & Straits, 1999). Computer-assisted telephone interview technology was used to administer the survey which took on average 21.7 minutes for primary care physicians and 20.5 minutes for non-primary care physicians. Physicians were offered $25 in advance by letter to participate in the survey. The survey completed 12,389 interviews, for a 58.6 percent response rate (*Community Tracking Study Physician Survey, 2000-2001*, 2003). One study regarding the response rate for the CTS reported the response rate did not change estimates appreciably and did not affect data quality. However, erring on the side of caution, the authors emphasized that low response rates should not be considered credible, and also noted that a response rate well above the percent achieved could have changed the survey results (Schoenman, Berk, Feldman, & Singer, 2003).

Community Tracking Study Sample

The CTS survey samples are concentrated in 60 communities that were randomly selected with probability and stratified sampling to be representative of the U.S. physician population. The sample frame from the primary data source used in this study (CTS 2000-2001) was obtained using the May 2000 AMA Masterfile and AOA membership file. The sample was stratified by geographic region, and a probability sample of primary care and non-primary care physicians was selected. PCPs included those with the following primary specialties: family practice, general practice, general pediatrics, general internal medicine, and internal medicine/pediatrics. Non-PCPs include all other specialties that were eligible for the survey. The physicians were selected from their preferred mailing addresses falling within one of the 60 CTS

site boundaries. Differences across strata are accounted for and not free to vary with the use of stratified sampling techniques (Singleton & Straits, 1999).

Sampling for the CTS is also affected by the longitudinal nature of the research. Each round for the CTS requires sufficient overlap to allow for panel analysis. Criteria for the physicians to be in the sample included:

- Having medical training completed
- Practicing in the contiguous U.S.
- Providing direct patient care for a minimum of 20 hours a week
- Focusing primarily on direct patient care
- Not being a federal employee
- Not being a foreign medical graduate with only a temporary license to practice in the U.S.

(*Community Tracking Study Physician Survey, 2000-2001*, 2003)

Eligibility for the survey was confirmed by the interviewer before continuing with the questioning (Diaz-Tena, Potter, Strouse, Williams, & Ellrich, 2003). The primary data for this study are concentrated in the latest survey (2000-2001), which includes income as a continuous variable, essential for the modeling in this study. Furthermore, for the analysis in this study, the clean sample excluded physicians who did not report income and those who reported income as less than $10,000 for the year, or who reported working less than eight weeks for the year.

Procedures

To obtain the CTS Restricted Use File for 2000-2001, a request was made to the Robert Wood Johnson Foundation. In addition to the formal application, a signed agreement with a data protection plan was submitted. Upon approval, the data file was sent on CD and protected in accordance with the proposed plan. Public Use Files for the CTS Physician Survey (1996-1997 and 1998-1999) were downloaded from the Health and Medical Archive website, the official data archive of the Robert Wood Johnson Foundation. All files were provided in ACSII format and were converted for analysis using SPSS software. The original CTS Physician Survey Restricted Use File for 2000-2001 included 12,406 records and 221 variables. The Public Use File for 1996-1997 included 12,528 cases and 120 variables, and the 1998-1999 file included 12,304 cases and 121 variables. Cleaning of the files in preparation for analysis is discussed in the data analysis section.

Institutional Review Board approval was obtained on March 8, 2006 (Appendix A). The review was expedited because secondary data were used.

Instrumentation

Secondary data analysis allows researchers to use data produced by "topflight professionals" without incurring the expense of time and money needed for a large-scale survey (Babbie, 2001). High level research organizations employ professionals who in the creation of surveys test for reliability and validity, two major concerns in any research project. Reliability tests the notion that repeating the same technique will consistently yield the same results (Babbie, 2001; Singleton & Straits, 1999). Validity, on the other hand, determines whether

something measures what it is intended to measure. If a measure is unreliable it cannot be valid; however, a reliable measure may still not be valid (Singleton & Straits, 1999). This study presents several constructs to measure particular concepts. Each was tested for validity, and the results are reported in the findings section. With the CTS Physician Survey administered since 1996, reliability has been tested and is implied. Although the CTS Physician Survey provides rich data and many variables, the variables in this study were selected to create a parsimonious model.

For an understanding of the CTS Physician Survey, Appendix B provides a list of variables from the 2000-2001 restricted use file with the variables used in this study highlighted. Appendix C provides a list of definitions for the variables included in this study; variables in the Public Use Files are similar, although they are often categorically coded to protect the identity of the survey respondents. Questions in each round of the Physician Survey have remained relatively consistent, with minor changes or additions in each wave. In 2000-2001, the survey included questions about use of information technology, which made the latent construct of specialization possible for this study. Further details about the variables selected are included in the data analysis section.

Income Gap

Income gap, an endogenous variable, was calculated for each physician's income that deviated from the average income of the study physicians, adjusting for the number of weeks worked. The procedures are as follows:

1) Average weekly income was calculated by taking the reported net income for 1999 (INCOMET: recorded in $1,000 increments and top coded at $400,000) divided by the number of weeks worked in 1999: y_i = INCOMET / WKSWRKC.

2) The income gap (INC_GAP) was calculated as: $\frac{y_i - \bar{y}}{\bar{y}} x100$.

The unit of analysis is the individual physician, and y_i is the calculated average weekly income.

Income for the CTS is self-reported by the physicians surveyed and hence not very reliable. Therefore, use of the relative value of the income difference assures a normal distribution as needed for structural equation modeling. The income gap calculation also controls for weeks worked. Using income gap, or the percent deviation from the mean income, is appropriate given the need to assess the relative importance of the factors influencing the gap.

Physicians included in the CTS sample had to be working at least 20 hours per week in direct patient care. This criterion controlled for part-time status, to which some studies attribute physician income differences (Kehrer, 1976; Ness et al., 2000). Using weeks worked instead of hours worked controlled for any significant differences in time that physicians spend in patient care.

Specialization

Specialization is a unique indicator constructed for this study. Since other researchers attribute part of physicians' income inequality to choice of specialty (Ash et al., 2004; Kehrer, 1976; Langwell, 1982; McMurray et al., 2000), this study moves beyond that to consider not only physician specialization including specific specialty, but also education, board certification,

use of technology, years of practicing specialty, and other attributes that would make a physician more specialized. The construct of specialization is illustrated in Figure 2.

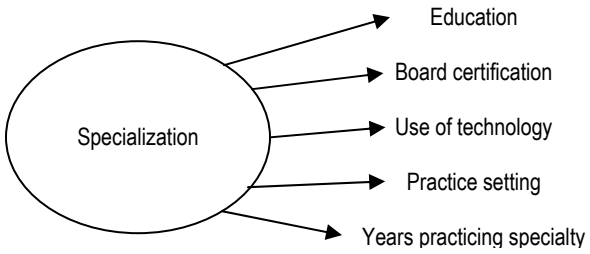


Figure 2: The Construct of Specialization

Demographic and Contextual Variables

Demographic and contextual variables were essential to this study. With gender as the foundation of this analysis, it was important to consider other contextual variables as well. As was expected, there were more males than females in the study, and analysis revealed how characteristics differed between the genders. The differences were noted for age, years in practice, doctor type, race, and region.

Measurement

This study uses structural equation modeling, performs significance tests, and assesses the overall model fit. The formula for income inequality is: $\text{Income gap} = \frac{y_i - \bar{y}}{\bar{y}} x100$. This equation serves to calculate the deviation from the mean income of the total physicians studied. The normative standard measures the difference from the mean income to indicate the level of

disparity in income, hence deviation from the mean. Income gap is defined as percent deviation from the mean. The structural equation model is illustrated in Figure 3.

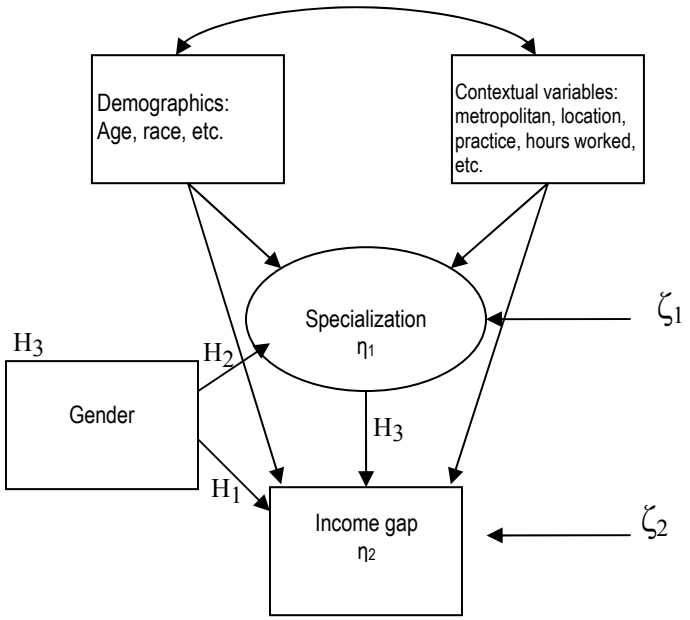


Figure 3: Structural Equation Model of Income Gap with Predictors

Descriptive analysis and normality of the distribution of variables were presented. Next, correlation analysis and exploratory factor analysis were used to test the measurement of specialization. The structural equation model was performed to test the overall fit of the proposed model of income gap.

Data Analysis

Although it is well known that female physicians earn less than their male counterparts, by assessing a range of earnings this study tested for the income gap while examining the

influence of particular variables on the gap and how the relative influence of each variable differed for females and males.

The following theoretically informed postulates were tested in this study, using advanced statistical methods.

H_1: There is a statistically significant income gap between female and male physicians.

H_2: Physician specialization is an important factor explaining the income gap between female and male physicians.

H_3: The relative importance of the factors explaining the income gap differs for female and male physicians.

It was first necessary to test H_1 as the foundation for further study. This study used t-tests, stepwise regression, exploratory factor analysis, and structural equation modeling to explain the income gap in physicians' income and the influence of gender. A simple t-test was used to answer the first research question: Does an income gap exist between female and male physicians? Regression was performed to confirm the findings. Stepwise regression identified the influence of each variable on the income gap. SEM allowed the benefit of measuring direct and indirect effects, which provided an understanding of the effects between two variables that were mediated by one or more intervening variables (Maruyama, 1997). SEM provided overall tests of model fit and individual parameter estimate tests simultaneously.

The variables selected for the study were analyzed using results of descriptive statistics in SPSS. Normality was observed to ensure proper treatment of the data. The latent construct for specialization was tested with reliability scores from Cronbach's Alpha. Primary analysis for this study was Structural Equation Modeling (SEM) using AMOS 6.0 software. SEM "is a powerful

analytical tool to validate the plausibility of a theoretically assumed structure of a set of the study variables, including exogenous and endogenous variables" (Wan, 2002, p. 85).

Identified by the literature as the most relevant control variables, these physician characteristics were used: age; gender; board certification; foreign medical school graduate; managed care experience (indicated by the "percentage of revenue from managed care"); community factors (4 regions); and type of practice (indicated by annual income and ownership). The same variables were identified and used in a previous study (Leigh et al., 2002). In this study, the endogenous variable (dependent) is net income after expenses, before taxes, calculated as the difference from the salary mean. Income gap in the model is defined as deviation from the mean when demographic and latent variables are controlled. Income was adjusted by weeks worked. Several studies have attributed the gender gap in income to female physicians working part-time, which necessitated the income adjustment. The study included the following predictor variables in explaining income gap:

- Gender
- Years in practice
- Board certification
- Practice setting / type of practice
- Age
- Medical school training (i.e. foreign medical graduate)
- Total weeks worked
- Specialization

Age, medical school training and total hours worked per work are defined as traditional human capital variables (Goldin & Polachek, 1987). Because the CTS Physician Survey includes only those physicians who work more than 20 hours each week, this study controlled for weeks worked. Theoretically, a physician's level of specialization goes beyond specialty choice. The

construct for specialization includes education, board certification, use of technology, practice setting, and number of years practicing in a particular specialty. The variables for "specialization" may be highly correlated, so to avoid multicollinearity, the variables were combined as a latent construct. Latent variables are theoretical or hypothetical constructs, when there is no direct operational method for measuring variables or a precise method for assessing their degree of presence. To illustrate the concept of a latent construct, consider how socio-economic status is defined by education, occupation, car owned, place or residence, etc.; no single variable explains socio-economic status. Although studies have shown physician specialty to affect income, this study treats specialization as a latent variable measured by related indicators. Multiple indicators are used to measure the construct of specialization in an effort to reduce measurement error. Although we know which specialty a physician chooses, the more specialized a physician is in her field, the more income is expected, while controlling for other intervening variables.

The study determined the goodness of fit of the proposed measurement model. The study tested if the measures selected for "specialization" actually belong together or demonstrate the construct validity of the measurement. SEM allowed testing whether the female and male models meet the assumption that they are equal by determining whether the path coefficients are invariant. Testing whether path coefficients in the models are equal for females and males considered the equalities of variables' variances, means, and intercepts, as well as the covariances between variables, and the equalities of path coefficients across the female and male groups. The structural equation modeling included model specification, identification, fit testing, and model modification. Using an exploratory approach, the model was based on a priori information and was evaluated to determine the adequacy of its goodness of fit for the data (Wan, 2002). Each

individual parameter had a standard error assessing its significance (Maruyama, 1997). Identification is the notion that at least one unique solution for each parameter estimate is identified in the SEM model. Effort was made to ensure the model was properly identified.

According to Wan (2002), there are regression assumptions that must be considered when using structural equation modeling. These include:

"1. No specification error.

2. No relevant independent variables have been excluded.

3. No irrelevant independent variables have been included.

4. No measurement errors: The variables X_i and Y_i are accurately measured.

5. Assumptions concerning the error term ε_i:

6. Zero mean: $E(\varepsilon_i) = 0$

7. For each observation, the expected value of the error term is zero.

8. Homoscedastiscity: $E(\varepsilon_i^2) = \text{Constant} = \sigma^2$; the variance of the error term is constant for all values of X_i.

9. No autocorrelations: $E(\varepsilon_i)(\varepsilon_j) = 0$ while $i \neq j$. The error terms are uncorrelated.

10. The independent variable is uncorrelated with the error term: $E(\varepsilon_i X_i) = 0$.

11. Normality: the error term ε_i, is normally distributed" (p. 62).

These assumptions were considered when fitting the best models for the study.

The Gini Coefficient is being used increasingly in health care studies (Horev et al., 2004). Also called the Gini Index, the Gini Coefficient is the index of income concentration. Often used by the U.S. Census Bureau to report income differentials, the Gini Coefficient is a measure derived from the Lorenz Curve (Henson & Welniak, 1978). This curve plots the cumulative

percentage of units against the "cumulative percentage of aggregate income on the ordinate as accounted for by these units" (Henson & Welniak, 1978, p. 286). The greater the inequality in the income distribution, the greater the area between the diagonal line and the Lorenz Curve. The Lorenz Curve is illustrated in Figure 4 (Henson & Welniak, 1978).

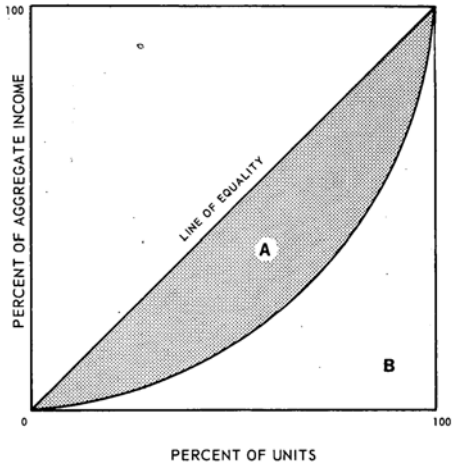


Figure 4: Lorenz Curve

Gini Coefficients were derived for each wave of data to reveal the level and persistence of income inequality in physicians' income since 1996. Income inequality, if any, was revealed in the charts created and included in the descriptive analysis in the findings section. Any Gini Coefficient above zero indicates some level of inequality.

The t-test for the mean difference in income gap between female and male physicians was used, assuming statistical significance at the .05 level and using Levene's Test for Equality of Variances. Regression coefficients were considered significant at the .05 level. The factor analysis component matrices considered variables above the .40 level and revealed the variables that fit together. Cronbach's Alpha above .60 was selected as a lenient indicator for a reliable measure.

For the structural equation model, the acceptable goodness of fit statistics include a root mean square error of approximate (RMSEA) value of .06, an adjusted goodness of fit index (AGFI) of .90 or larger, and the comparative fit index (CFI) value of .90 or above. Gender bias is demonstrated if the difference in income gap between females and males cannot be explained by other variables. The goal of this study is to find a reasonable and parsimonious explanation of the inequality in income based on gender. The measurement model describes the latent variable in terms of the defined, observed variables. The structural equation model specifies the relationships among the latent variables and describes effects and the amount of unexplained variance. If gender explains a large variance in the income gap, gender bias will be empirically demonstrated.

Summary

This study sets out to formulate a model that explains that income gap by gender among physicians. A national sample from the Community Tracking Study Physician study is used in a cross-sectional design. Advanced statistical tests are employed including stepwise regression and structural equation modeling. Three hypotheses are tested and results reported in Chapter five. Income gap and specialization are unique variables in this study that will contribute to the current literature on income differences between female and male physicians.

CHAPTER FIVE: FINDINGS

This chapter presents the findings from the analysis described in Chapter four, beginning with the characteristics of the sample, data examination, and results from the various statistical tests conducted.

Descriptive Statistics

The data was examined with descriptive statistics to ensure that assumptions were met as required to run the appropriate tests. First, the demographic distribution of the sample was explored. Then tests for normality were performed.

Sample

Descriptive statistics were run for each of the three waves of data. Public Use Files provide age, years in practice and income as categorical variables. Demographics for 1996-1997 and 1998-1999 waves are presented in a table separately from the 2000-2001 Restricted Use File. Males were found to be older than females and have more years of experience. Income categories were higher for males across the board. Weeks worked were very similar for males and females throughout the three waves. However, males were found to consistently work more hours than females.

Charts for specialty category and practice type are also presented, in Appendix D. Males were more likely to be found in surgical specialties, and both genders were found to practice

more often in solo or small group practices. Overall, differences in the demographics of the three waves were slight, as is expected given the panel design for the CTS Physician Survey.

The following table reflects values for key demographic variables for Wave 3, 2000-2001.

Table 1: Demographic Variables of the Study Physicians, 2000-2001

VARIABLE	FEMALES		MALES	
	Mean	***SD***	***Mean***	***SD***
Age	42	8.5	47	10.6
Years in practice	9	7.9	15	10.7
Income category (7 categories)	2.9	1.2	4.0	1.5
Income	116,948	56,757	173,357	84,730
Weeks worked in 1999	46.27	5.9	47.64	4.0
Hours worked in previous full week	47.57	15.6	55.19	15.3
	%		**%**	
Gender (n=12,111)	26		74	
Race (White n=9549)	23.6		76.4	
Race (non white n=2562)	35.2		64.8	
Primary care physician (PCP) (n=7662)	31.2		68.8	
Non-primary care physician (NPC) (n=4449)	17.2		82.8	
MD (n=11,109)	26.3		73.7	
DO (n=1002)	23.2		76.8	
Foreign medical graduate (n=2535)	27.6		72.4	
Metro under 200K (n=411)	18.5		81.5	
Non-metro/rural (n=1267)	18.6		81.4	
Metro over 200K (n=10,433)	27.2		72.8	
Outside 60 sites (n=1684)	24.0		76.0	
West (n=2588)	26.7		73.3	
Midwest (n=2247)	27.0		73.0	
South (n=3396)	23.0		77.0	
Northeast (n=2196)	30.4		69.6	
Ownership interest (n=6407)	18.2		81.8	
Board certified (n=10,622)	26.5		73.5	

SD=Standard deviation

To provide confidentiality to the respondents, the Public Use Files categorized variables such as age, years in practice, and income. The changes from waves one to two were minimal and are presented in Table 2. Once again, the slight changes reflected the sound panel design for the CTS.

Public Use Files

Table 2: Demographic Variables of the Study Physicians, 1996-1997 and 1998-1999

	FEMALES		MALES	
96-97 n=12,511 98-99 n=12,301	*Mean*		*Mean*	
	96-97	**98-99**	**96-97**	**98-99**
Age (8 categories)	6.01	6.30	4.92	5.29
Years in practice (10 categories)	7.62	8.02	6.35	6.80
Income category (7 categories)	2.84	2.85	3.91	3.94
Weeks worked	47.15	47.10	47.93	47.86
Hours worked in previous full week	47.84	47.08	55.53	54.59
	%		**%**	
Gender (96-97 n=12,511) (98-99 n=12,301)	20.6	23.5	79.4	76.5
Race (98-99 White n=9917)	**	21.2	**	78.8
Race (98-99 non-white n=2384)	**	33.1	**	66.9
Primary care physician (PCP) (96-97 n=7190) (98-99 n=7262)	24.8	28.9	75.2	71.1
Non-primary care physician (NPC) (97-97 n=5321) (98-99 n=5039)	14.8	15.8	85.2	84.2
MD / DO	(not in 96-97/98-99 Public Use Files)			
Foreign medical graduate (96-97 n=2554) (98-99 n=2642)	22.9	26.9	77.1	73.1
Metro under 200K	(not in 96-97/98-99 Public Use Files)			
Ownership interest (96-97 n=7124) (98-99 n=6434)	13.8	16.2	86.2	83.8
Board certified (96-97 n=10,384) (98-99 n=10,532)	20.9	23.8	79.1	76.2

** Categories for these variables are described in Appendix E.*
*** Race was not ascertained in the first wave of the CTS.*

Overall, the characteristics of the samples did not change significantly from one wave to the next. Similarities in the ratios throughout the waves indicate consistency in the cohort study, as was expected.

Gini Coefficients

Gini Coefficients were calculated for the three waves of data. With the income variable being categorical in the first two waves of the Public Use Files, the Gini Coefficients made it

possible to measure the inequality over the three waves of data. A Gini Coefficient equal to one reflects perfect inequality. In each of the three waves, females were closer to one than were males, reflecting the greater inequality in income experienced by female physicians.

GINI INDEX	1996-1997	1998-1999	2000-2001
Females	.33	.33	.30
Males	.025	.015	.005
1=perfect inequality			

Table 3: Gini Coefficients for Three Waves of CTS Data for Income

The Gini Coefficients show there has been little change in the inequality in physician income since the first CTS Physician Survey in 1996. Despite females entering medicine at a higher rate, significant differences in income still exist between females and males.

Lorenz curves are illustrated in Figures five through seven.

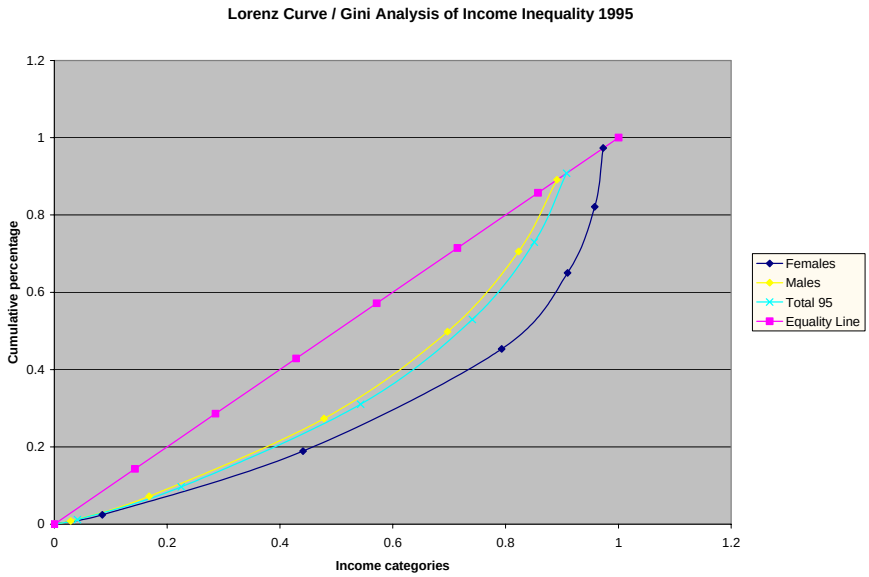


Figure 5: Lorenz Curve 1995

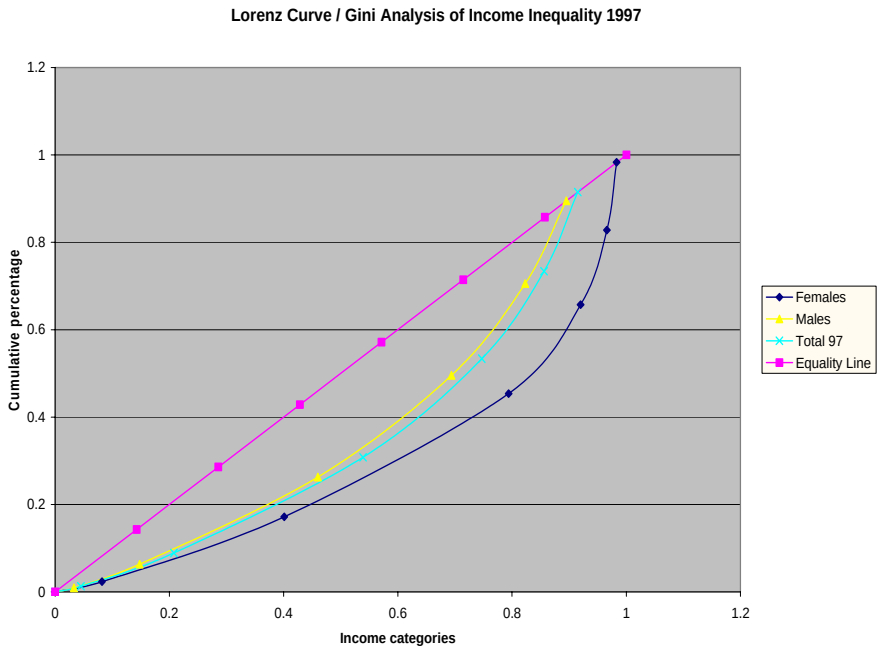


Figure 6: Lorenz Curve 1997

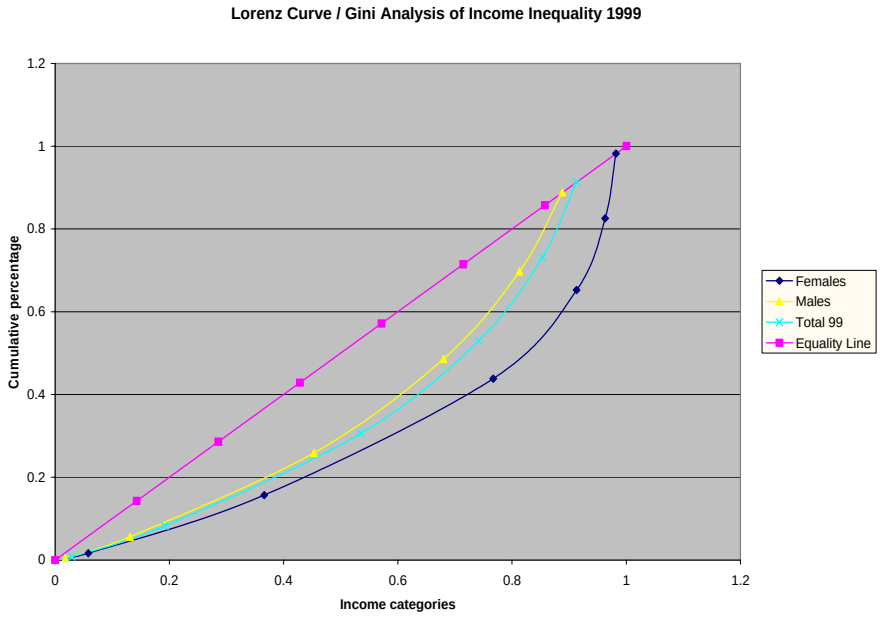


Figure 7: Lorenz Curve 1999

Data Examination

Before performing multivariate analysis, examination of the missing data was necessary. In order to run regression analyses, missing data was resolved. Data cleaning focused on the 2000-2001 wave. With the telephone survey process, the interviewers were able to minimize missing values. For most variables in this study, missing data were not a concern. For income, 1.3 percent of cases were deleted, having reported zero income or income under $10,000. Only .9 percent of values for income were missing, and these cases were also deleted. Thirteen cases were deleted for reporting working less than eight weeks in 1999. Otherwise, missing values were handled with listwise deletion in the analysis. Several variables such as weeks worked had missing values already resolved with imputation. With such a large sample size, deleting cases did not impact the study.

A correlation matrix was run (see Appendix F) to determine if the exogenous and endogenous variables were correlated and to test for multicollinearity. Several IT variables were correlated but multicollinearity was not a problem. Normality plots were inspected for each variable to reveal any violation of the variables' distribution.

Exploratory Factor Analysis

Factor analysis was conducted to determine whether the indicator variables properly reflected the construct of specialization. The exploratory factor analysis revealed three separate constructs related to specialization: 1) Information Technology (IT) Use; 2) IT Access; and, 3) PCP or Specialist. The rotated component matrix is shown in Appendix G. The total variance

explained by these three latent constructs was 48 percent. Further exploratory analysis using Stepwise Regression showed which factors had the greatest explanatory power. For both genders, access to the internet had the greatest explanatory power. Use of technology in treatment was influential in explaining specialization for males.

Structural Equation Model

Analysis of the proposed structural equation model indicated a poor overall fit of the model to the data. The predictors and best fit models were different for males and females, according to the stepwise regression analysis and SEM. To address the hypotheses presented, detailed analysis follows with relevant data presented or available in the appendices as noted.

Hypothesis One

Hypothesis one, an alternative hypothesis, stated that there is a statistically significant income gap between female and male physicians. The t-test showed that this hypothesis is supported, because mean income gap is significantly different between females (33.7) and males (50.1).

Group Statistics

	gender1	N	Mean	Std. Deviation	Std. Error Mean
INC_GAP	0.00	3,150	33.6653	16.53005	0.29452
	1.00	8,950	50.1308	24.75019	0.26162

Table 4: Mean Income Gap for Females and Males

Levene's Test for Equality of Variances is significant at the .05 level revealing that the assumption that the two groups have approximately equal variance on the dependent variable

(INC_GAP) is rejected and the two variances are significantly different. For output of the independent samples test, see Appendix H.

Regressing income gap on gender showed that gender explained 9.1 percent of the variance. Other variables may explain the bulk of the variance in the income gap, keeping in mind that unmeasured variables not in this regression model might affect the explanatory power of gender when entered into the regression equation. Gender effect is statistically significant at the .05 level. Adding variables to the model will change their relative importance and may affect the size of the regression coefficients. The model summary and coefficients for this regression model are found in Appendix I. Overall, this hypothesis is supported by the results from a t-test and regression that show a statistically significantly difference in the income gap between female and male physicians.

Hypothesis Two

Hypothesis two states that physician specialization is an important factor explaining the income gap between female and male physicians. Guided by the literature, variables available in the CTS data set were extracted to measure specialization. Conceptualized beyond simple choice of specialty, specialization was designed to measure how specialized a physician was through the use of information technology, education, board certification, practice setting, and years in practice. Using an exploratory factor analysis, three separate latent constructs emerged. The indicators of specialization showed three orthogonal constructs. Thus, these constructs were treated as separate predictors of income gap. The rotated component matrix can be found in Appendix G.

The three components of specialization are labeled as follows:

1) Information Technology (IT) Use: measured by use of IT to generate reminders about preventive services (ITRMNDR3), use of IT to obtain information about formularies (IT_FORM3), use of IT to access patient notes, medication lists, and problem lists (ITNOTES3), use of IT to write prescriptions (ITRX3), and use of IT for clinical data and image exchanges with other physicians (ITCLIN3).

2) IT Access: measured by use of IT to obtain treatment alternatives or recommended guidelines (IT_TRT3), use of IT to communicate with patients by email (ITCOMM3), Internet access at the practice site (IT_INT3), and board certification (boardcrt).

3) PCP or Specialist: measured by specialist (SPECLST surgical specialties coded as 0, all others as 1), whether or not the practice is competitive (compete3), and whether or not the physician is primary care (PCP, coded 0 for PCP, 1 not PCP).

Board certification clearly is not an indication of IT use. Further factor analysis without this variable revealed a better fit and also moved ITCLINC2 to the latent construct for IT Access. Construct of the three latent variables based on the factor analysis resulted in the model shown in Figure 8.

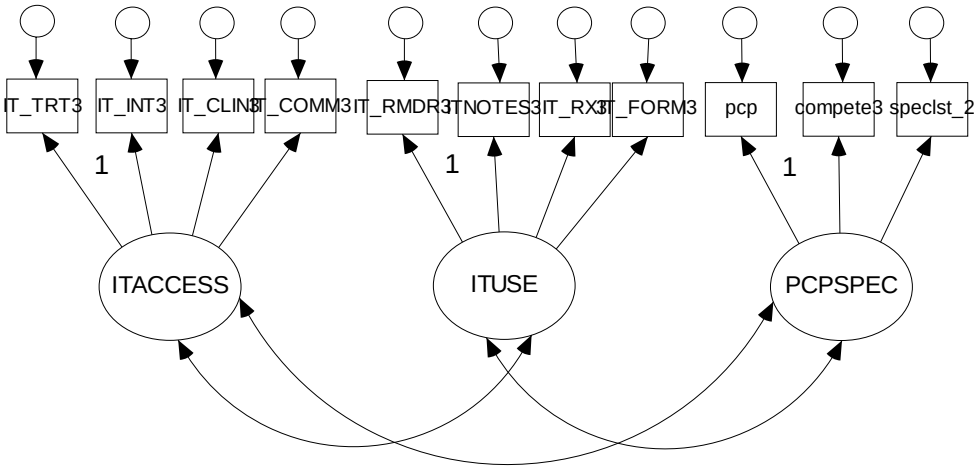


Figure 8: Latent Constructs for Specialization

To measure the reliability of these constructs, Cronbach's alpha was calculated for each construct. IT Use is the only one of the three constructs that meets the lenient alpha cut-off of .60, showing a reliable measure of this latent construct. The reliability score for IT Access does not meet the lenient alpha cut-off of .60, which reveals that adding variables would make this measure more reliable. However, the CTS data are limited and no additional variables were available. The alpha score for IT Access is .584. PCPSPEC is far from meeting the lenient alpha cut-off of .60 with an alpha score of only .134, indicating that additional variables are necessary to make this a reliable measure. Specialization was found to be multidimensional. Although the construct is not a perfect fit, IT use was found to be most reliable. Output for the reliability tests are found in Appendix J.

The lack of reliability makes it clear that the indicators of specialization do not adequately measure physician specialization as a uni-dimensional construct. It would be necessary to include multiple, separate constructs of specialization as predictors of income gap while controlling for contextual and demographic variables.

Further exploratory analysis, using Stepwise Regression, identified the variables in the specialization model that best explain the variation in income gap. PCP (indicator for PCP or not PCP) is the best predictor of the income gap, explaining 15.2 percent of the variance. Gender is the second most important predictor, and when added to the model increased the explanatory power to 21.2 percent. Adding all variables for the "specialization" construct, with three latent variables, explains almost 25 percent of the variance in income gap. The ANOVA table, in Appendix L, shows that each step is significant at the .05 level. The Collinearity Statistics do not show high multicollinearity, which would be indicated by a tolerance value equal to zero. Instead, the predictor variables are not highly correlated among themselves. The standardized beta coefficients reflect their relative importance in predicting the income gap. The model could be further specified to include additional variables if they were available for the survey. The stepwise regression model summary is in Appendix L.

When a separate stepwise regression analysis was performed for females and males, it is interesting to note that the variables had less explanatory power for females than for males. Removing gender from the equation and analyzing the data file split for females and males, the complete model explains only 7.5 percent of the variance for females, indicating that there are other variables that may explain the income gap variation for females. However, the model explains almost 20 percent of the variation in income gap for males. For the model summary, see Appendix M.

Structural equation modeling was performed to determine the effects of specialization and gender on income gap. The results of this confirmatory test are in Table 5. Running a structural equation model using AMOS computer software to determine model fit for the three constructs for the latent variable specialization resulted in an overall poor fit with a Chi-square

value of 1942.453. The RMSEA value of .05 is acceptable, in that less than .06 reflects that the model fits the data. Specialization, with these constructs, does not provide adequate explanatory power to identify income gap. Specialization accounts for only 30 percent of the variance in the income gap. The model tested can be found in Appendix K.

Table 5: Effects of Specialization and Gender on Income Gap

Predictors	***b***	**SE**	**β**	**CR**
PCPSPEC	-33.89	.94	-.49	-36.10*
IT Access	5.26	2.76	.06	1.90
IT Use	-7.30	4.09	-.06	-1.783
Gender	12.57	.43	.23	29.11*
R^2=.302				
** Statistically significant at p=0.05* ***b*** Unstandardized regression coefficients β Standardized regression coefficients				
Goodness of fit statistics: Tucker-Lewis: .862; CFI: .909; RMSEA: .050 Chi-square = 1942.453; Degrees of freedom = 60; p = .000				

Overall, the CTS Physician Survey data do not provide sufficient variables to measure physician specialization or provide an analysis explaining the effect of specialization on the income gap. In fact, the variables that are provided have less predictive power for females than for males. The alternative hypothesis two: physician specialization is an important factor explaining the variation in income gap between female and male physicians, cannot be confirmed with this data. Although the hypothesis is not fully supported, an important multi-dimensional construct was identified. Providing data to support further testing of the effects of specialization and not simply a specialty category is an important contribution of this research. Hypothesis two is not fully supported, but is conditionally accepted because specialization was found to be an important multi-dimensional construct. However, the constructs extracted are not

good measures of specialization and would require additional variables to reach statistical significance.

Hypothesis Three

Hypothesis three states that the relative importance of the factors explaining the income gap differs for female and male physicians. Exploratory analysis with Stepwise Regression revealed that the relative importance of the factors explaining the income gap is indeed different for female and male physicians. In fact, all relevant variables selected from the CTS Physician Survey for this study explained only 11.3 percent of the variance for females but 23.8 percent for males. The model summary is found in Appendix N.

Using confirmatory testing, the best fit SEM model for females resulted in a Chi-square value of 2674.968 with 146 degrees of freedom and .000 probability level. The RMSEA value was .074. This is a poorly fitted model. The best fit model for males yielded a Chi-square value of 7231.933 with 146 degrees of freedom and .000 probability level. The RMSEA value for this model is .073. Again, the model is poorly fitted. Furthermore, testing an overall model with the full sample yielded a Chi-square value of 11353.293 with 164 degrees of freedom and a .000 probability level. The RMSEA value generated is .074. The models are all poorly fitted for the data. The results for the three models tested are found in Table 6. The model tested is illustrated in Figure 9.

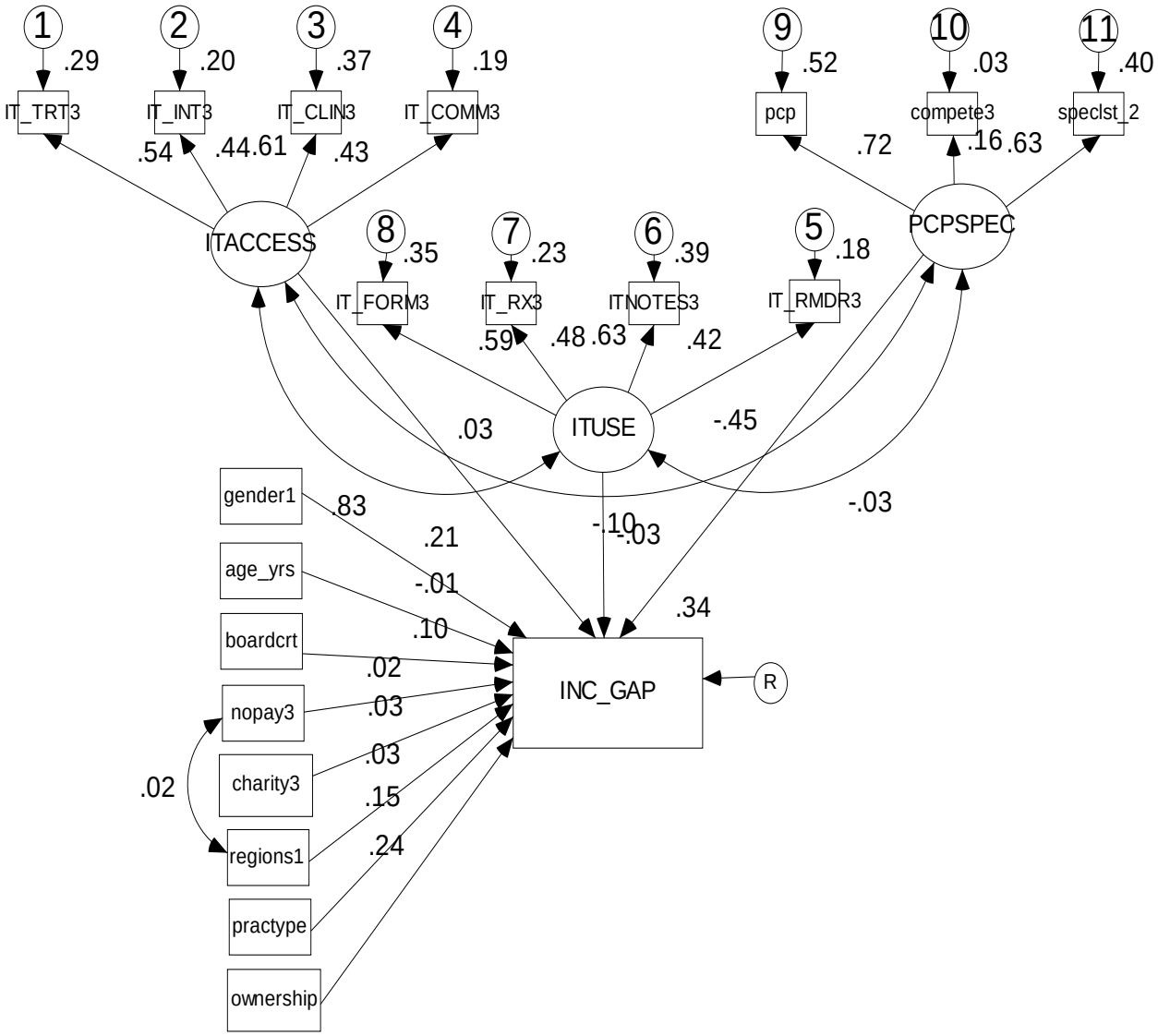


Figure 9: Model Tested for Effects of Specialization and Gender on Income Gap, with Control Variables

Table 6: Effects of Specialization and Gender on Income Gap with Control Variables

	b			**SE**			**β**			**CR**		
Predictors	*All*	*Female*	*Male*	*All*	*Female*	*Male*	*All*	*Female*	*Male*	*All*	*Female*	*Male*
PCPSPEC	-30.73	-21.33	-32.00	.89	2.36	1.03	-.45	-.37	-.47	-34.49*	-.902*	-31.0*
IT Access	2.75	-.28	4.59	2.64	4.40	3.19	.03	-.004	.05	1.04	-.06	1.44
IT Use	-3.71	-1.89	-5.21	3.91	6.26	4.81	-.03	-.02	-.04	-.95	-.30	-1.08
age_yrs	-.03	.09	-.06	.02	.03	.02	-.01	.05	-.03	-1.40	2.9*	-2.69*
boardcrt	7.46	3.43	8.30	.55	.88	.68	.10	.06	.11	13.50*	3.89*	12.29*
nopay3	1.21	.82	1.33	.48	.68	.61	.02	.02	.02	2.53	1.20	2.20*
charity3	1.57	.46	1.91	.40	.57	.50	.03	.01	.04	3.942*	.80	3.79*
regions1	.50	.22	.574	.14	.21	.17	.03	.02	.03	3.66*	1.09	3.63*
practype	7.36	6.81	7.42	.39	.61	.47	.15	.18	.14	19.02*	11.20*	15.68*
ownership	11.15	7.16	12.37	.37	.57	.46	.24	.21	.25	30.37*	12.59*	26.84*
gender	11.25			.41			.21			27.06*		
FEMALES R^2=.223 | MALES R^2=.32 | ALL R^2=.341												
** Statistically significant at 0.05* ***b*** Unstandardized regression coefficients β Standardized regression coefficients												
FEMALES Goodness of fit statistics: Tucker-Lewis: .561; CFI: .626; RMSEA: .074 Chi-square = 2647.968; Degrees of freedom = 146; p = .000												
MALES Goodness of fit statistics: Tucker-Lewis: .560; CFI: .662; RMSEA: .073 Chi-square = 7231.933; Degrees of freedom = 146; p = .000												
ALL Goodness of fit statistics: Tucker-Lewis: .536; CFI: .638; RMSEA: .074 Chi-square = 11353.293; Degrees of freedom = 164; p = .000												

Regression and structural equation modeling revealed that the factors explaining the variation in income gap for females and males are different, as are their relative influences. Therefore, hypothesis three, that the relative importance of the factors explaining the variation in income gap differs for female and male physicians, is affirmed. Exploratory analysis with Stepwise Regression indicated that the top three predictors for females' income gap are whether or not they are primary care physicians, ownership in the practice, and board certification. For males, the top predictor for the income gap is whether or not they are primary care physicians, which is the same as for females. The next two for males are ownership and specialist (whether they hold a surgical specialty). SEM confirmed that the relative influences of the factors that influence the income gap are indeed different for females and males.

Summary

This study set out to test three hypotheses. These and the decisions rendered for each are shown in Table 5.

Table 7: Hypotheses and Decisions Rendered

Hypothesis	**Decision Rendered**
H_1: There is a statistically significant income gap between female and male physicians.	Accepted
H_2: Physician specialization is an important factor explaining the income gap between female and male physicians.	Not fully supported, conditionally accepted
H_3: The relative importance of the factors explaining the income gap differs for female and male physicians.	Accepted

Implications of these findings are discussed in Chapter six. Additional data are needed to show definitively which factors explain the differences in income gap between female and male physicians.

CHAPTER SIX: DISCUSSION AND IMPLICATIONS

With medicine having the highest income gap by gender of the professions (Weinberg, 2004), this study endeavored to determine the extent of the disparity in the physician income gap as well as the factors which explain the difference. With the factors most influential in shaping the variation in income gap identified, public policy could address the problem more effectively to bring equality to female physicians. Despite the body of literature on gender inequality in income, studies have yet to adequately identify the factors that result in females consistently making less money than their male counterparts do. The specific barriers to income equality are not yet known. What is known is that the current federal policies to protect income equality and prevent wage discrimination have not been effective.

Discussion of Findings

This study set out to test three hypotheses. Hypothesis one is supported, in agreement with previous studies that have found a difference in income between females and males. Studies have shown income differences not only in medicine but in other industries as well (Blau & Kahn, 1994; Brunner, 2005; *Equal Pay for Working Families: National and State Data*, 2004; Kehrer, 1976; Ohsfeldt & Culler, 1986; *Women in management: Analysis of selected data from the Current Population Survey 18-19*, 2001). This study found a statistically significant income gap between female and male physicians. The income gap was measured by controlling for weeks worked instead of simply comparing mean income. Gender was found to explain 9 percent of the variation in income gap. According to the feminist perspective, gender should exert no influence on income. With other factors exerting influence on the income gap,

hypothesis two was then tested to determine the importance of specialization in explaining the income gap.

Although researchers have tried to explain differences in income by asserting that female physicians choose lower paying specialties (Baker, 1996; Laine & Turner, 2004), developing a construct for specialization was expected to account for other variables that influence how specialized a physician may be. Use of the latest equipment and staying in touch with technological advances can increase physician income (Moon, 2004); therefore, several variables were combined to create a latent construct for specialization. Factor analysis resulted in the identification of three constructs, IT use, IT access, and PCP/Specialty. The most reliable of these constructs is IT use. However, stepwise regression found that the variables from the specialization construct most influential in explaining the income gap are: primary care physician status, gender, surgical specialty, internet access at the workplace, whether the practice is competitive, and use of information technology to obtain treatment alternatives. According to the social justice perspective, these factors reflect the vulnerability of the populations and predict the income gap. This construct could not be adequately tested with the limited variables from the CTS. The variables provided made for a poor construct that failed to measure specialization as a uni-dimensional construct. Therefore, we cannot say whether specialization is a construct explaining the income gap, and hypothesis two is not fully supported. Several indicators of specialization were found to have an influence on the income gap. The construct of specialization needs additional measures.

As the income gap continues for physicians, it is necessary to identify the factors influencing the gap in order to resolve the inequality. The purpose of hypothesis three was to make that identification. Determining which factors best explain the gender differences in

physician income can shape public policy to resolve that inequality. Certain factors are not amenable to change: gender, race, and age. However, the factors most influential for males, such as surgical specialty, ownership status, board certification, IT use and access, must be considered in the recruitment and retention of female physicians. Female physicians need equal access to the factors that may lead to equal pay. The effects of the variables on the income gap are different for females and males; therefore, hypothesis three is supported. The overall model included variables that better explain the income gap for males than for females. The explanatory power of the variables was less for females meaning there are other variables not in the study that could better predict the income gap for females. However, the effects are different by gender which supports the third hypothesis.

Overall, this study finds that there is a statistically significant income gap between female and male physicians which supports the notion that females earn less than males in part due to discrimination or gender bias. Factors contributing to specialization do influence the income gap. The variables necessary to properly measure specialization are not available in the CTS Physician Survey. This concept is nonetheless worthy of further consideration since select variables were found to influence the income gap. Females must be encouraged to specialize if the income gap is to be resolved. The factors influencing the income gap are different for females and males. As policy makers revise or create better laws to protect income equality, these differences must be taken into consideration.

Policy Implications

Although employees are protected from compensation discrimination by several Federal Laws, including the Equal Pay Act of 1963, Title VII of the Civil Rights Act of 1964, the Age Discrimination in Employment Act of 1967, and Title I of the Americans with Disabilities Act of 1990, the wage gap has changed little over many decades. The U.S. Equal Opportunity Commission (EEOC) is responsible for enforcing those laws which assert that jobs that require substantially equal skill, effort and responsibility and are performed under similar working conditions within the same establishment require equal wages for females and males. Obviously, however, no effective means to enforce equal pay laws now operates, or the income gap would not be so persistent and so slow to change. EEOC is mandated to look at the following factors when considering pay discrimination: skill, effort, responsibility, working conditions, and type of establishment. However, no proactive pursuit of justice seems to occur. If the federal laws were enforced consistently and complaints were resolved more quickly and more in the females' favor, employers might have incentive to improve their employment practices. Medicine, and perhaps other industries with egregious disregard for equal opportunity law, should be targeted to get them to comply with federal law and policy (Rose & Hartman, 2004). Some of the factors considered in wage discrimination cases may be argued to be subjective; objective data from this study are intended to provide relatively clear evidence of gender discrimination.

Since studies have tried to reveal interrelationships between various variables including managed care, professional autonomy, career satisfaction, and income (Stoddard et al., 2001), if gender were no longer derived as an intervening indicator of differences, other areas could be more closely studied. Salary is quantifiable and therefore easily tracked and discrepancies

rectified. By fixing this inequality, focus could then be put on less easily measured features of gender bias: lack of mentorship, isolation, patronization, lower expectations, and the hostile environment that female physicians sometimes face (Carr et al., 2003). "The objective numerical gender equity at all ranks in academic medicine will require more than ingenuity on the part of individual faculty members. It will require institutional efforts to address the needs of faculty who are actively striving to excel in their work while honoring the values and commitments that make them whole" (Brown et al., 2003, p. 1006). Supporting and increasing female physicians could foster more focus and research on female health issues (*Gender discrimination*, 1994). One study found that individuals living in states with higher ratios of primary care physicians to population are more likely to report good health (Shi & Starfield, 2000). These, too, are important issues for policy consideration in addition to the problem of gender income discrimination.

"Discrimination is often defined as that portion of the earnings gaps unexplained by individual characteristics" (Goldin & Polachek, 1987, p. 144). Blau and Kahn (1994) describe the change in the "unexplained" differential as an estimate of discrimination. Research continues to show that the claim can no longer be made that there is an unawareness of the advantage of being male is not recognized. By whatever means that advantage manifests, policy should support equality so that females' work is no longer devalued. England (2004) argues that females are unlikely to achieve equality in jobs and politics unless males share the burden of household and child-rearing work. A recent editorial in the *Lancet* ("Efforts to address gender inequality must begin at home," 2005) naively implies that "family" consists of two heads of household whose decisions balance family issues and income. The author of the editorial asserts that eliminating the causes of discrimination requires policies that address the power gap within the

family, where decisions about education, health, nutrition, child-bearing, and money are made. "It is this dynamic that policymakers must understand and influence if the fundamental gender inequalities are to be addressed" (Efforts, 2005, p, 1505). The editorial correctly notes, "Investment in policies to address these injustices has benefits far beyond the well-being of individual women" (Efforts, 2005, p. 1505). Understanding all the conditions that restrict females from prominent positions and equal pay is certainly crucial for understanding and eradicating sources of gender inequality.

A specific need now is for new comparable-worth policies so that equal pay laws remedy the trend for jobs held disproportionately by females to be paid less. Researchers have argued that eliminating wage discrimination by implementing comparable worth policies would reduce poverty among female workers by almost 40 percent (Figart and Lapidus, 1994; as reported in Figart, 1997). Job evaluation systems that measure job content on many different dimensions could benefit those underpaid in positions traditionally held by females (Rose & Hartman, 2004). Gender inequality reflects the need for transparent compensation systems. The glass ceiling that hinders females from advancing into higher paying positions and assuming practice ownership and prominent positions in academia must be recognized and removed. Programs to support and encourage females in the medical field must be compatible with the incentives and career concerns of physicians (Fournier & Henderson, 2005).

With studies such as this showing that, while controlling for confounding variables and measuring the influence of gender, an income gap still exists, it is time for "equal pay for equal work" to at last be expected and enforced. The economy could be benefited by increasing the purchasing power of females. With gender bias clearly conceptually implied, the time has come to demand income equality for females and males in medicine. Without institutional efforts,

female medical faculty will continue to receive lower salaries (Kaplan et al., 1996), and perhaps female physicians and females in other industries will, too. If the wage gap were eliminated now, female physicians would no longer be *expected* to earn less, changing a salary tradition that would otherwise follow throughout their careers. As income is considered in policy development, it is essential to understand the role of physicians' choices to specialize and the differences by gender. Perhaps this study can join with all the other research on wage discrimination to one day remedy the far broader issue.

Contributions

This study makes several contributions to the literature. The foremost finding is a statistically significant income gap between female and male physicians. Certain variables have greater influence on the income gap and differ by gender. A major conceptual contribution of this study is the multi-dimensional construct for specialization. Intending to measure specialization and its effect on the income gap, factor analysis revealed three distinct constructs. Although these constructs are a poor fit for the model, specialization is indeed an important, multi-dimensional concept that affects the income gap.

This study uniquely analyzed the income gap as opposed to marking simple differences in income. Conceptualizing income gap as a measure derived from the difference in physician's income from the mean income, while controlling for weeks worked, allowed testing that did not try to explain physician's income, but instead explained the variation in income between females and males. This is an important conceptual contribution.

Theoretically, from the social justice and feminist perspectives in this study, equal pay for equal work would be the norm. From a feminist perspective, gender should not explain any variance in income. Gender did explain some variance. However, from a social justice perspective, females may have some control over the factors that influence the income gap such as choice of primary care or surgical specialty, region where they live, type of practice, and ownership interest in the practice. For the income gap to be closed, a nation that is just must create and enforce policies to ensure that the factors that lead to equal income are equally available to both genders. Females should be encouraged to take on ownership of practices, invest in new technology, and choose high-paying specialties. Support should be available for females to foster those steps.

Methodologically, this study makes a contribution to the literature by using structural equation modeling. SEM used multiple predictors and determined relationships between variables. Although the overall model is not a good fit, rich information is made available that goes well beyond what simple regression would have presented. With advanced statistically testing, the study makes an important contribution to policy by affirming the need to support female physicians as they strive to close the income gap. Several factors were identified that can help and that should guide policies to protect and encourage females in making choices that ensure equality in income.

This research confirms that the gender gap in income still exists for physicians and has changed little since 1996. The influence of various factors on the income gap and the differences of these between females and males suggest that policy should take into account what is most likely to increase income for females, which is likely to be different from such factors for males. Although the CTS Physician Survey provides rich data, it cannot answer all questions about

system changes in health care. The survey was clearly not intended primarily to measure gender differences. Subsequent rounds of the survey could pose additional questions to better understand how the entrance of females into medicine at a greater rate is changing the face of health care. Study of gender issues at a national level is warranted, as is, therefore, further development of instruments such at the CTS.

Limitations of the Study

There are several limitations of this study. To protect equal wages, the EEOC is required to consider the following: skill, effort, responsibility, working conditions, and type of establishment. These concepts could not be adequately measured with data from the CTS Physician Survey. Skill is not measured, and effort is reflected only in weeks and hours worked, which is not a sufficient reflection of effort. Responsibility is derived from ownership, although this could not possibly encompass the plethora of other responsibilities a physician may have. Working conditions and type of establishment could be assessed with variables such as practice type and number of physicians in the practice; however, the conditions and nature of the establishment and how they are perceived could be very different for females and males. The data are not sufficient to objectively measure the factors upon which the EEOC would render its decisions about wage discrimination.

Income can be affected by particular skills or attributes that were not measured in this study, such as ambition and attitude. Trends in particular medical practices and specialties also could affect income. The study does not unequivocally provide "proof" that discrimination exists. Females may choose particular specialties, including those with lower income potential,

for reasons that are not measured in this study. One economist believes that identifying discrimination as the unexplained residual after controlling for other variables is a nebulous conclusion (Figart, 1997).

This study does not measure discrimination, lack of mentorship, exclusion from peer networks, sexual harassment, or inadequate policies to support the work/family balance, which are considered important factors that may lead to gender-specific inequality (Gender discrimination, 1994). With gender reflected in a complex and varying social system, we must consider that individual-level measurement will not make predictions about society and culture, and is limited for understanding gender's influence on social behavior (Riley, 1999). An economist definition of labor market discrimination is a multidimensional system of economic, social, political, and cultural forces, seen not only in the workplace but in the family as well, that leads to pay, employment, and status disparities between the sexes (Figart, 1997). This complex web cannot be measured with the data used in this study: "To many, it would seem that their income has a far greater value than just the dollar: It enables them to have the freedom to thrive both professionally and personally. And that's the type of broad-based inner satisfaction that numbers just can't measure" (Tolkoff, 2005, paragraph 20).

One key problem with secondary analysis is the question of validity. The data collected is not always appropriate for particular research interests. As is seen in this study, additional questions on the survey might have resulted in a better fitted model. Although the Robert Wood Johnson Foundation supports research in an effort to provide rich databases to answer important research questions, not all questions can be answered even with the data it makes available.

Practical Implications

This study implies that continued monitoring of the structure of physician income is necessary. Until the Gini coefficients move to indicate greater equality in income among female and male physicians, the CTS should be used to verify whether the income gap continues and to what extent. The CTS, in its effort to monitor health system change, must move beyond its current somewhat patriarchal survey design to include questions relevant to the advancement of females and female issues. With females' entrance into medicine at a rate almost greater than males', females are certain to change the health care system as it is currently known. Further development of the CTS for its future waves would help bring about better understanding of females in medicine and of their overall role in health system change.

With this study having identified some factors that influence the income gap, consideration could be given to educating medical students about the factors that lead to more equality in income. Females could be better trained on technological advances in their respective fields. They could also be advised on how to better balance work and family in a way that makes it possible to choose more demanding specialties and to consider practice ownership, which is also demanding. There are factors that result in higher pay, and females can make the choices that will do just that. They should be supported in doing so.

Future Research

Several suggestions for future research can be derived from the current study. Many demographic variables were not considered in the study, such as marital status and number of children in the physician's family. A more in-depth study of the demographic and contextual

variables that may influence income could be considered. A qualitative approach could assess how much awareness female physicians have of the income gap. One might hypothesize that if more female physicians were clearly aware of the gender gap in their incomes, more would act to resolve it. Perhaps, on the other hand, non-pecuniary rewards are more important to females, in which case attention should be paid to incentives other than income alone.

Many factors affect physician income, many more than are measured in this study. Liability insurance can affect practice profits and limit physicians' income. Solo practice has a higher risk, since group practice can share overhead. Further study could assess the effects of insurance and other practice cost variables on physician income. As physicians try to protect their incomes, consideration must be given to how that may affect overall spending (Bernstein, 1998).

A more in-depth study could use communities as the unit of analysis and make comparisons across the U.S. Such a study could incorporate the construct for specialization to see whether certain U.S. communities could be considered more specialized. The CTS panel design is commended, but would benefit from questions added that are of interest to females. Since certain particular characteristics are not amenable to change, we must identify those variables influencing the income gap that can be changed. Asking questions about work/family balance, opportunities for advancement, level of skill and responsibility, and perhaps the factors the EEOC considers in wage discrimination cases could provide research to serve as the foundation for needed policy revisions. Researchers should be challenged to consider gender differences in all studies of health system change.

Conclusion

This study of the income gap in medicine revealed the normative income standard for the "average physician" and showed it to be different for females than for males. The study data show that males make more money and that females are farther from the mean. The variation in income gap is predicted by IT use, although that is not a perfect measure. In practice, general practitioners could be encouraged to become more technologically advanced if they wish to make more money. Federal policy could provide grants to female physicians to purchase new technology, in an effort to close the income gap.

Specialization is a unique construct created here to measure its influence on the income gap beyond simply a specialty category. This multi-dimensional construct is necessary to predict the income gap and identify the differences by gender. Additional variables for the construct were found to be necessary to create a reliable and statistically significant measure. There are distinct differences in physician income by gender. The relative importances of the predictors are different by gender, a finding that could help shape policy to close the income gap.

This study confirms that the income gap persists for physicians. Since females tend to choose lower paying specialties, specialization as a construct that influences the income gap provides a unique measure going beyond simply specialty choice. Variables in addition to use of and access to information technology and specialties are needed to accurately assess the effect of specialization on income. The factors that influence the variation in income gap differ for females and males; that information should help shape future policy or aid in the enforcement of wage discrimination laws. Current policies have failed to close the income gap for physicians. Studies that reveal the factors influencing income should point to the steps necessary to resolve

the gendered income gap. Gender did explain variance in the income gap. Gender bias was empirically demonstrated.

APPENDIX A: INSTITUTIONAL REVIEW BOARD APPROVAL

University of Central Florida

Office of Research & Commercialization

March 8, 2006

Wendy Bolyard
2700 Cheval Street, #103
Orlando, FL 32828

Dear Ms. Bolyard:

The University of Central Florida's Institutional Review Board (IRB) received your protocol IRB #06-3335 entitled **"Explaining Gender Disparities in Physicians' Income: Implications for Public Policy."** The IRB Chair reviewed the study on 3/7/2006 and did not have any concerns with the proposed project. The Chair has indicated that under federal regulations (Category 4, research involving the collection or study of exiting data, documents, records, if these sources are publicly available or if the information is recorded in such a manner that the subjects cannot be identified) this research is **exempt** from further review by our IRB, so an approval is not applicable and a renewal within one year is not required.

Please accept our best wishes for the success of your endeavors. Should you have any questions, please do not hesitate to call me at 407-823-2901.

Cordially,

Barbara Ward

Barbara Ward, CIM
UCF IRB Coordinator
(IRB00001138, FWA00000351, Exp. 5/12/07)

Copies: IRB File
Thomas Wan, Ph.D.

BW:jm

12443 Research Parkway • Suite 302 • Orlando, FL 32826-3252 • 407-823-3778 • Fax 407-823-3299

THE UNIVERSITY OF CENTRAL FLORIDA

INSTITUTIONAL REVIEW BOARD (IRB)

IRB Committee Approval Form

PRINCIPAL INVESTIGATOR(S): **Wendy Bolyard** **IRB#: 06-3360**
Supervisor: Thomas Wan, Ph.D.

PROJECT TITLE: Explaining Gender Disparities in Physicians' Income: Implications for Public Policy

[X] New project submission [ ] Resubmission of lapsed project #
[ ] Continuing review of lapsed project #_____ [ ] Continuing review of #
[ ] Study expired: [ ] Initial submission was approved by expedited review
[ ] Initial submission was approved by full board review but continuing review can be expedited
[ ] Suspension of enrollment email sent to PI, entered on spreadsheet, administration notified _____

Chair
[ ] Expedited Approval

Dated: _____
Cite how qualifies for expedited review:
minimal risk and _____

[X] Exempt

Dated: 3/7/06
Cite how qualifies for exempt status:
minimal risk and #4

[ ] Expiration Date: _____

IRB Reviewers:

Signed: _____
Dr. Jacqueline Byers, Chair

Signed: _____
Dr. Sophia Dziegielewski, Vice-Chair

Signed: _____
Dr. Tracy Dietz, Vice-Chair

Complete reverse side of expedited or exempt form
[ ] Waiver of documentation of consent approved
[X] Waiver of consent approved
[ ] Waiver of HIPAA Authorization approved

NOTES FROM IRB CHAIR (IF APPLICABLE):
Waiver of Consent approved because data were collected by someone else -- This is a secondary analysis project. JYD

APPENDIX B: CTS PHYSICIAN SURVEY VARIABLES

Restricted Use File 2000-2001

Variable *	Description
	Survey Administration Variables
PHYSIDX	Physician unique identifier
R2PHYIDX	Value for PHYSIDX in Round 2 of CTS
SITEID	SITE variable, City
MSACAT	Large metro/small metro/non-metro
FIPS	State and county code when surveyed
BIRTH	Birth year obtained from AMA/AOA
GRAD_YR	Medical school graduation year obtained from AMA/AOA
AMAPRIM	PCP type obtained from AMA/AOA (PCP or not PCP)
SUBGRP	Subgroup in sample
IMGSTAT	Country of medical school
IMGUSPR	Foreign medical school graduate
DOCTYP	Doctor type (MD, DO)
GENDER	Sex,1-Male,2-Female obtained from AMA/AOA
	A: Introduction
MULTPR	Multiple practices
_MULTPR	Imputation flag for MULTPR
NUMPR	Number of practices
YRBGN	Year began practicing medicine
NWSPEC	Primary specialty
GENSUB	General practice vs. subspecialty
SIPNPED	Subspecialty, internal, or pediatrics (non-pediatrics)
SIPPED	Subspecialty, internal, or pediatrics (pediatrics)
SUBSPC	Subspecialty
PCPFLAG	Primary care physician flag
SPECX	Combined Specialty/Subspecialty
BDCERT	Board certification status
BDCTPS	Board certified in primary/sub specialty
BDELPS	Board eligible in primary/sub specialty
CARSAT	Overall career satisfaction
	B: Utilization of Time
WKSWRK	Weeks practicing medicine in 1999
WKSWRKC	Weeks worked in 1999,without new physicians
_WKSWRKC	Imputation flag for WKSWRKC
HRSMED	Hours worked in previous week (medically-related)
_HRSMED	Imputation flag for HRSMED

HRSPAT	Hours worked in previous week in direct patient care
_HRSPAT	Imputation flag for HRSPAT
HRFREE	Hours previous month charity care
_HRFREE	Imputation flag for HRFREE
PATINFO	Percentage of patients who talk about information they heard
PATACT	Percentage of patients suggested tests then ordered
EFINFO	Effect of medical information patients obtain on quality care
EFEFF	Effect of medical information patients obtain on efficiency
	C: Type and Size of Practice
OWNPR	Ownership status(Full/Part/No Own)
_OWNPR	Imputation flag for OWNPR
TOPOWN	Type of practice (owners)
TOPOWNC	Practice type (owners)
TOPEMP	Type of employer (non-owner)
TOPEMPC	Employer type
TOPEMPA	Employer type (all employees)
OTHSET	Government hospital or clinic
EMPTYP	Employer type, coded
EMPTYP2	Type of employer, other
PRCTYPE	Practice type
GRTYPE	Type of group physician
ALLPRTP	All practice type
OTHPAR	Owner: Other physicians in practice
OTHGRP	Owner: Other physicians in group
HSPPAR	Owner: Hospital
INSPAR	Owner: Insurance company, HMO
ORGPAR	Owner: Other
C5OWNER	Outside ownership
ORGC_1	Other owner, organization is listed
ORGC_2	Don't know type, other organization
ORGC_6	Owner, organization integrated health system
ORGC_7	Owner, organization physician practice management
ORGC_8	Owner, management services organization
ORGC_9	Owner, physician hospital organization
ORGC_10	Owner, university/medical school
ORGC_11	Owner, medical foundation
ORGC_12	Owner, other non-profit
ORGC_13	Owner, other physicians in practice
ORGC_14	Owner, another physician group
ORGC_15	Owner, hospital or group of hospitals

ORGC_16	Owner, insurance company, health plan or HMO
SETTING	Setting where spend most time
_SETTING	Imputation flag for SETTING
NPHYS	Number of physicians at practice
_NPHYS	Imputation flag for NPHYS
ACQUIRD	Practice acquired in last 2 years
_ACQUIRD	Imputation flag for ACQUIRD
OWNPUR	Responsible ownership when practice purchased
CTL_WRK	Importance of control of hours
CTL_DEC	Importance of control of clinical decisions
CTL_INC	Importance of potential income
CTL_BUS	Importance of control of business decisions
	D: Medical Care Management
IT_TRT	IT used get info on treatment alternatives
IT_FORM	Uses IT to obtain info on formularies
ITRMNDR	IT used to generate reminders
ITNOTES	Uses IT to access patient notes
ITPRESC	Uses IT to write prescriptions
ITCLIN	IT used to exchange clinical data
ITCOMM	Uses IT to communicate with patients on clinical issues
ACC_INT	Access to Internet in office
FORMLRY	Percentage of patients with prescription coverage formularies
_FORMLRY	Imputation flag for FORMLRY
EFGUIDE	Effect of formal written guidelines
AWRGUID	Aware of formal written guidelines
_AWRGUID	Imputation flag for AWRGUID
EFPROFL	Effect of practice profile result
AWRPROF	Aware of practice profiling
_AWRPROF	Imputation flag for AWRPROF
EFSURV	Effect of patient satisfaction surveys
AWRSURV	Aware of patient satisfaction surveys
_AWRSURV	Imputation flag for AWRSURV
QU_FRMY	Quality of care: prescription drug formularies
QUGUIDE	Effect of formal guidelines on efficiency/quality
QUPROF	Effect of practice profiling on efficiency/quality
QUSURV	Effect of patient satisfaction surveys on efficiency/quality
CMPPROV	Change-complexity without referral, PCP
CMPEXPC	Appropriateness without referral, PCP
SPECUSE	Change-number of referrals to specialists
PCTGATE	Patients for whom gatekeeper

_PCTGATE	Imputation flag for PCTGATE
CMPCHG	Change-complexity at referral, NPCP
CMPLVL	Appropriateness at referral, NPCP
CHGREF	Change-# referrals by PCPs
	F: Physician – Patient Interactions
ADQTIME	Adequacy of time, all physicians
CLNFREE	Freedom for clinical decisions
HIGHCAR	Possibility of high quality care
NEGINCN	Decision w/o negatively effecting financial incentives
USESPCS	High communication level with specialists
COMPRM	Communication with primary care physicians
COMMALL	Level of communication, all physicians
PATREL	Continuing patient relationships
OBREFS	Referrals to quality specialists
OBANCL	High quality ancillary services
OBHOSP	Non-emergency hospital admission
OBINPAT	Adequate number inpatient days
OBIMAG	High quality diagnostic imaging
OBMENTL	High quality inpatient mental health care
OBOUTPT	High quality outpatient mental health care
REFPROV	Referral difficulties: Not enough service providers
REFHP	Referral difficulties: Health plan and administrative barriers
REFINS	Referral difficulties: Patient has inadequate insurance
HSPPROV	Hospital admissions: Not enough service providers
HSPHP	Hospital admissions: Health plan and administrative barriers
HSPINS	Hospital admissions: Patient has inadequate insurance
MHPROV	Outpatient mental health services: Not enough service providers
MHHP	Outpatient mental health services: Health plan/administrative barriers
MHINS	Outpatient mental health services: Patient has inadequate insurance
NWMCARE	Accept new Medicare patients
_NWMCARE	Imputation flag for NWMCARE
NWMCAID	Accept new Medicaid patients
_NWMCAID	Imputation flag for NWMCAID
NWPRIV	Accept new privately insured
_NWPRIV	Imputation flag for NWPRIV
NWNPAY	Accept new uninsured patients who can not pay
_NWNPAY	Imputation flag for NWNPAY
ACC_CAP	Accept new patients with capitated contracts
_ACC_CAP	Imputation flag for ACC_CAP

	G: Practice Revenue
PMCARE	Percentage of payments from Medicare
_PMCARE	Imputation flag for PMCARE
PMCAID	Percentage of payments from Medicaid
_PMCAID	Imputation flag for PMCAID
PCAPREV	Percentage of practice revenue prepaid, capitated
_PCAPREV	Imputation flag for PCAPREV
NMCCON	Number of managed care contracts
_NMCCON	Imputation flag for NMCCON
PMC	Percentage of practice revenue from managed care
_PMC	Imputation flag for PMC
	H: Physician Compensation Methods and Income Level
SALPAID	Salaried physician flag
SALTIME	Compensate per work time period
SALADJ	Salary adjustments
BONUS	Eligible for bonuses
SPROD	Own productivity affects compensation
SSAT	Patient satisfaction affects compensation
SQUAL	Quality measures affect compensation
SPROF	Profiling results affect compensation
RADJ	Profiles are risk adjusted
_RADJ	Imputation flag for RADJ
PCTINCN	Percentage of income from bonuses
PCTINCC	Percentage of income from bonuses, corrected
_PCTINCC	Imputation flag for PCTINCC
EBONUS	Eligible for bonuses in 1999
INCOMET	Net income in 1999
_INCOMET	Imputation flag for INCOMET
INCENT	Overall financial incentives
_INCENT	Imputation flag for INCENT
EFINCNT	Effect of financial incentives
FININCPT	Effect of financial incentives on patient care
COMPETE	Competitive situation of practice
HISP	Hispanic origin
RACE	Race
	***** *Weights and sampling variables not listed*

Highlighted variables used in dissertation study.

(Community Tracking Study 2000-01 Physician Survey Restricted Use File: Codebook (Release 1), 2003)

APPENDIX C: DEFINITIONS OF STUDY VARIABLES

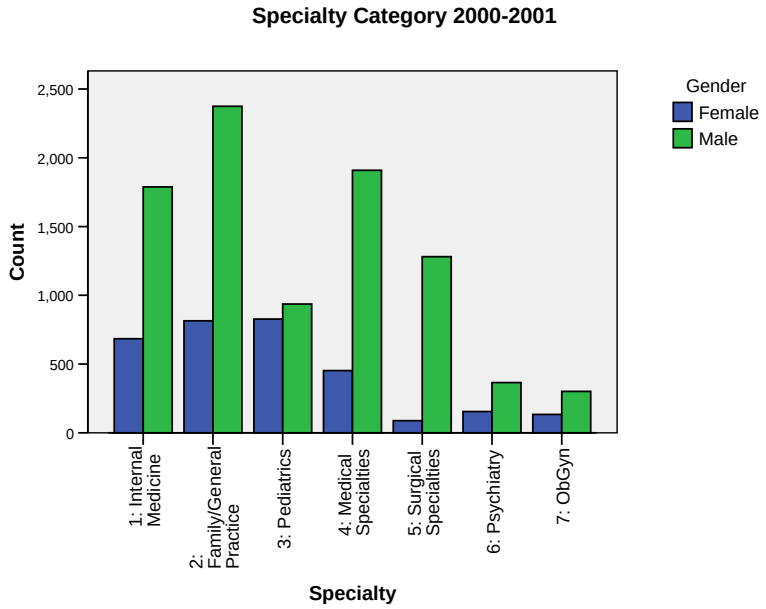
Wave 3: 2000-2001

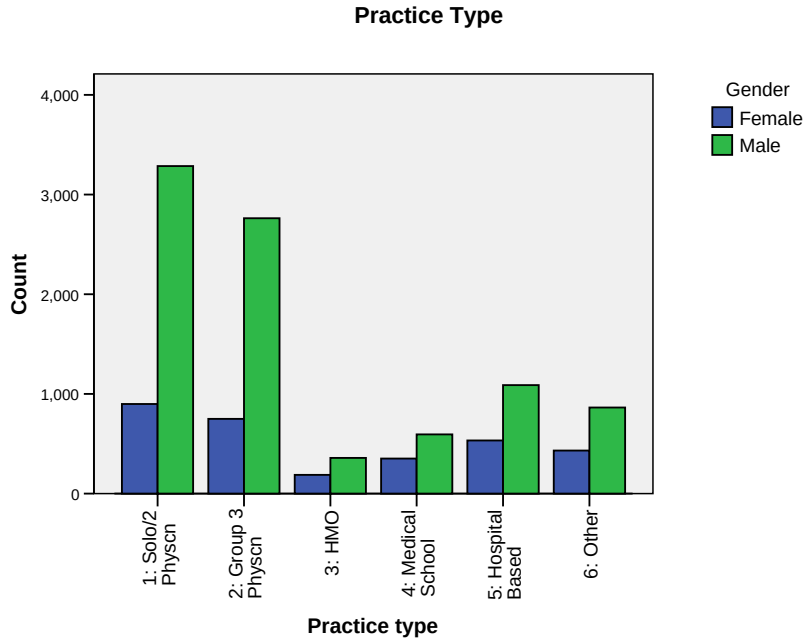
Variable	Type	Definition
PREDICTOR VARIABLES		
SPECIALIZATION ***(an exogenous latent variable)***		
boardcrt	Ca	Board certified (0: other; 1: board certified)
speclst2	Ca	Physician specialty (0: surgical; 1: other)
pcp	Ca	AMA or AOA flag for PCP or not PCP (0: Not PCP; 1: PCP)
compete3	Ca	Is practice competitive? (0: no; 1: yes)
IT_INT3	Ca	Internet access at place where provide most patient care (0: no; 1:yes)
IT_FORM3	Ca	Computers/IT to obtain information on formularies (0: no; 1:yes)
IT_TRT3	Ca	Computers/IT to obtain information about treatment alternatives (0: no; 1:yes)
ITCLIN3	Ca	Computers/IT for clinical data and image exchanges (0: no; 1:yes)
ITCOMM3	Ca	Computers/IT to communicate clinical issues w/ patients by email (0: no; 1:yes)
ITNOTES3	Ca	Computers/IT to access patient notes, medication/problem lists (0: no; 1:yes)
ITRX3	Ca	Computers/IT to write prescriptions (0: no; 1:yes)
ITRMNDR3	Ca	Computers/IT to generate reminders for preventive services (0: no; 1:yes)
INCOME GAP ***(an endogenous latent variable)***		
INCOMET	Co	1999 net income after expenses, before taxes ($1,000 increments, top coded at $400,000)
incomecat	Ca	Income category (1: $0-49,999; 2: $50,000-99,999; 3: $100,000-149,999; 4: $150,000-199,999; 5: $200,000-249,999: 6: $250,000-299,999; 7: =>$300,000 top coded)
INC_GAP	Co	Calculated as difference from mean of average income.
PMC	Co	% of practice revenue from all managed care
practype	Ca	Practice type (0: Solo/2; 2: Other/group)
ownership	Ca	Ownership interest in practice (0: no; 1: yes)
charity3	Ca	Provide some charity care (0: no; 1: yes)
nopay3	Ca	Practice accepts patients who are unable to pay (0: no; 1: yes)
CONTROL VARIABLES		
age_yrs	Co	Years of age (1999 – BIRTH = age)
doctype	Ca	AMA or AOA flag for doctor type (0: DO; 1: MD)
gender1	Ca	AMA or AOA gender (0: Female; 1: Male)
intgrad	Ca	AMA or AOA flag for foreign medical graduates (0: other; 1: US, PR)
yrsinprac	Co	Years in practice (1999 – YRBGN = yrspac)
WKSWRKC	Co	Number of weeks practiced medicine in 1999
HRSMED	Co	Hours physician spent in medically related activities during last complete week of work
metro	Ca	Population count to define areas (1: Non-metro area/rural; 2: Metro under 200K; 3: Metro over 200K)
race3	Ca	Race (0: non-white/other; 1: white)

regions1	Ca	Region (0: Outside 60 test cities;1: West; 2: Midwest; 3: South; 4: Northeast)
DATA IDENTIFIERS		
PHYSIDX	Co	Unique identifier for each physician.
R2PHYIDX	Co	Round 2 unique identifier for each physician.

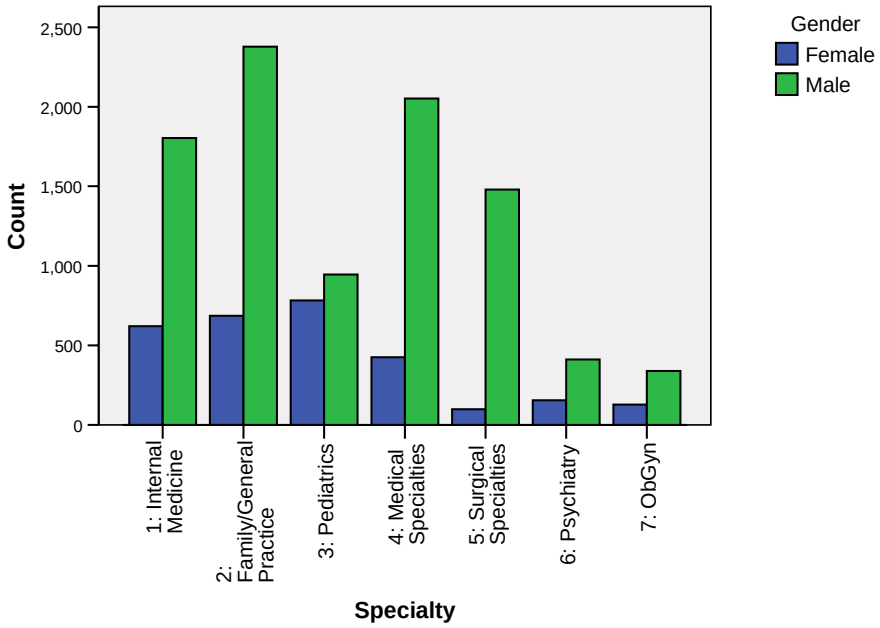
Note: Ca=category variable; Co=continuous variable

APPENDIX D: SAMPLE DEMOGRAPHICS

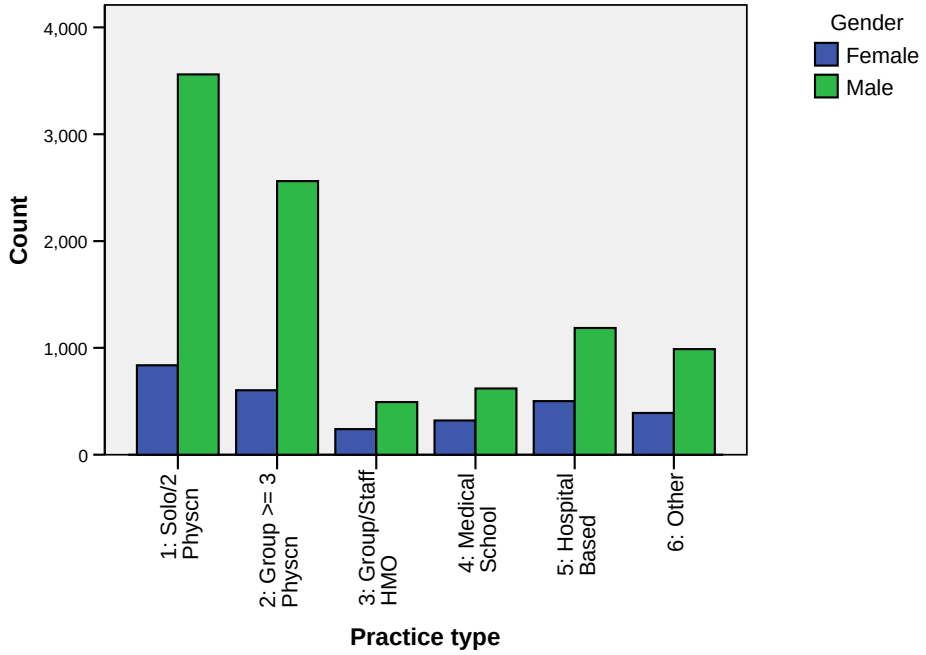




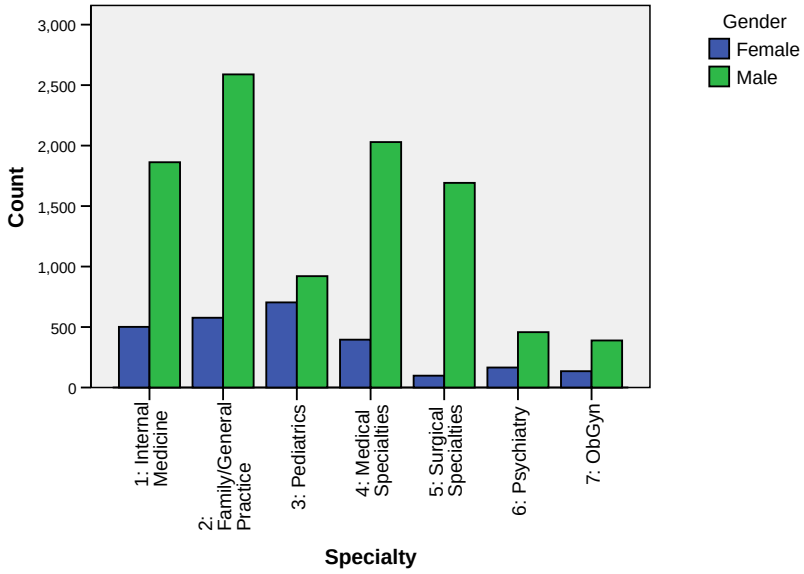
Specialty Category 1998-1999



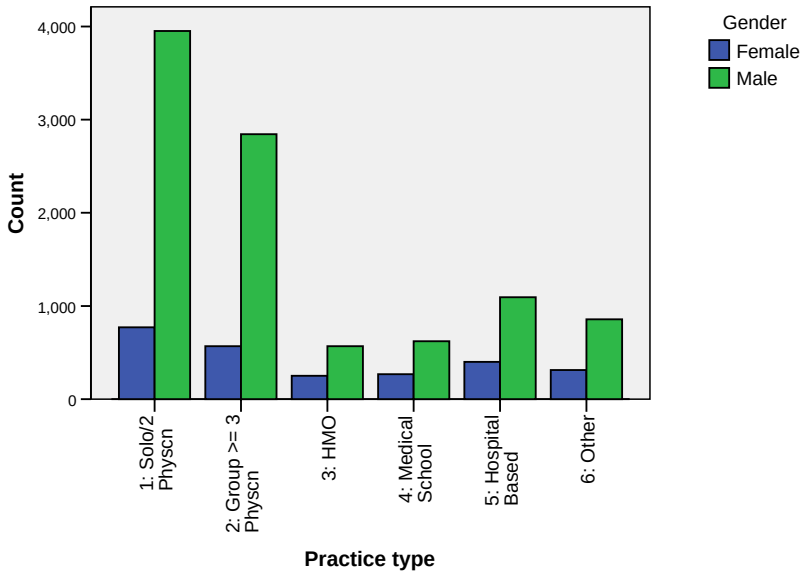
Practice Type 1998-1999



Specialty Category 1996-1997



Practice Type 1996-1997



APPENDIX E: PUBLIC USE FILES CATEGORY DESCRIPTIONS

Age:

1: 1930 or earlier

2: 1931-1935

3: 1936-1940

4: 1941-1945

5: 1946-1950

6: 1951-1955

7: 1956-1960

8: 1961 or later

Years in Practice:

1: 1955 or earlier

2: 1956-1960

3: 1961-1965

4: 1966-1970

5: 1971-1975

6: 1976-1980

7: 1981-1985

8: 1986-1990

9: 1991-1993

10: 1994 or later

Income:

1: $0-49999

2: $50000-99999

3: $100000-149999

4: $150000-199999

5: $200000-249999

6: $250000-299999

7: $300000 or more

APPENDIX F: CORRELATION MATRIX

Correlations(a)

		nopay3	charity3	INC_GAP	IT_INT3	IT_COMM3	IT_CLIN3	IT_RX3	ITNOTES3	IT_RMDR3	IT_FORM3	IT_TRT3	compete3	speclst_2	PMC
nopay3	Pearson Corr.	1	.146(**)	.066(**)	.057(**)	-.026(**)	.035(**)	-0.017	.022(*)	0.013	.046(**)	.045(**)	.043(**)	-.070(**)	-.110(**)
	Sig. (2-tailed)		0.000	0.000	0.000	0.004	0.000	0.058	0.018	0.146	0.000	0.000	0.000	0.000	0.000
charity3	Pearson Corr.	.146(**)	1	.100(**)	0.011	-0.005	-.032(**)	-.043(**)	-.064(**)	.024(**)	-0.005	.031(**)	.073(**)	-.101(**)	-.058(**)
	Sig. (2-tailed)	0.000		0.000	0.233	0.575	0.000	0.000	0.000	0.009	0.584	0.001	0.000	0.000	0.000
INC_GAP	Pearson Corr.	.066(**)	.100(**)	1	.109(**)	.021(*)	.045(**)	-0.016	.034(**)	0.002	0.010	-0.001	.099(**)	-.351(**)	-.070(**)
	Sig. (2-tailed)	0.000	0.000		0.000	0.021	0.000	0.085	0.000	0.790	0.267	0.888	0.000	0.000	0.000
IT_INT3	Pearson Corr.	.057(**)	0.011	.109(**)	1	.196(**)	.234(**)	.119(**)	.213(**)	.126(**)	.210(**)	.323(**)	.029(**)	-.047(**)	.019(*)
	Sig. (2-tailed)	0.000	0.233	0.000		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.037
IT_COMM3	Pearson Corr.	-.026(**)	-0.005	.021(*)	.196(**)	1	.270(**)	.142(**)	.225(**)	.149(**)	.212(**)	.232(**)	.025(**)	-.037(**)	.059(**)
	Sig. (2-tailed)	0.004	0.575	0.021	0.000		0.000	0.000	0.000	0.000	0.000	0.000	0.006	0.000	0.000
IT_CLIN3	Pearson Corr.	.035(**)	-.032(**)	.045(**)	.234(**)	.270(**)	1	.207(**)	.396(**)	.189(**)	.305(**)	.299(**)	.024(**)	-.022(*)	.038(**)
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000		0.000	0.000	0.000	0.000	0.000	0.008	0.015	0.000
IT_RX3	Pearson Corr.	-0.017	-.043(**)	-0.016	.119(**)	.142(**)	.207(**)	1	.338(**)	.247(**)	.287(**)	.144(**)	-.019(*)	.045(**)	.070(**)
	Sig. (2-tailed)	0.058	0.000	0.085	0.000	0.000	0.000		0.000	0.000	0.000	0.000	0.040	0.000	0.000
ITNOTES3	Pearson Corr.	.022(*)	-.064(**)	.034(**)	.213(**)	.225(**)	.396(**)	.338(**)	1	.255(**)	.335(**)	.225(**)	0.007	-0.017	.035(**)
	Sig. (2-tailed)	0.018	0.000	0.000	0.000	0.000	0.000	0.000		0.000	0.000	0.000	0.454	0.054	0.000
IT_RMDR3	Pearson Corr.	0.013	.024(**)	0.002	.126(**)	.149(**)	.189(**)	.247(**)	.255(**)	1	.239(**)	.205(**)	.040(**)	.018(*)	.065(**)
	Sig. (2-tailed)	0.146	0.009	0.790	0.000	0.000	0.000	0.000	0.000		0.000	0.000	0.000	0.048	0.000
IT_FORM3	Pearson Corr.	.046(**)	-0.005	0.010	.210(**)	.212(**)	.305(**)	.287(**)	.335(**)	.239(**)	1	.351(**)	.025(**)	0.011	.049(**)
	Sig. (2-tailed)	0.000	0.584	0.267	0.000	0.000	0.000	0.000	0.000	0.000		0.000	0.005	0.239	0.000
IT_TRT3	Pearson Corr.	.045(**)	.031(**)	-0.001	.323(**)	.232(**)	.299(**)	.144(**)	.225(**)	.205(**)	.351(**)	1	.024(**)	.039(**)	0.015
	Sig. (2-tailed)	0.000	0.001	0.888	0.000	0.000	0.000	0.000	0.000	0.000	0.000		0.009	0.000	0.102
compete3	Pearson Corr.	.043(**)	.073(**)	.099(**)	.029(**)	.025(**)	.024(**)	-.019(*)	0.007	.040(**)	.025(**)	.024(**)	1	-.138(**)	.018(*)
	Sig. (2-tailed)	0.000	0.000	0.000	0.001	0.006	0.008	0.040	0.454	0.000	0.005	0.009		0.000	0.044
speclst_2	Pearson Corr.	-.070(**)	-.101(**)	-.351(**)	-.047(**)	-.037(**)	-.022(*)	.045(**)	-0.017	.018(*)	0.011	.039(**)	-.138(**)	1	.079(**)
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.015	0.000	0.054	0.048	0.239	0.000	0.000		0.000
PMC	Pearson Corr.	-.110(**)	-.058(**)	-.070(**)	.019(*)	.059(**)	.038(**)	.070(**)	.035(**)	.065(**)	.049(**)	0.015	.018(*)	.079(**)	1
	Sig. (2-tailed)	0.000	0.000	0.000	0.037	0.000	0.000	0.000	0.000	0.000	0.000	0.102	0.044	0.000	

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

a. Listwise N=12100

APPENDIX G: FACTOR ANALYSIS

Rotated Component Matrix (a)

	Component		
	1	2	3
pcp	.025	-.095	.812
compete3	.050	-.015	-.376
IT_TRT3	.292	.630	.093
IT_FORM3	.595	.301	-.017
IT_RMDR3	.608	.018	.031
ITNOTES3	.663	.226	-.116
IT_RX3	.680	-.027	.051
IT_CLIN3	.480	.438	-.085
IT_COMM3	.279	.462	-.028
IT_INT3	.123	.671	-.034
boardcrt	-.276	.536	-.076
speclst_2	.045	-.010	.830

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a Rotation converged in 5 iterations.

Rotated Component Matrix(a)

	Component		
	1	2	3
pcp	-.062	.019	.818
compete3	.022	.019	-.363
IT_TRT3	.737	.127	.075
IT_FORM3	.427	.505	-.014
IT_RMDR3	.098	.609	.048
ITNOTES3	.276	.666	-.115
IT_RX3	-.015	.764	.064
IT_CLIN3	.508	.404	-.095
IT_COMM3	.534	.172	-.042
IT_INT3	.718	-.014	-.064
speclst_2	.025	.027	.832

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a Rotation converged in 5 iterations.

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.706	24.604	24.604	2.706	24.604	24.604	1.875	17.041	17.041
2	1.541	14.008	38.612	1.541	14.008	38.612	1.865	16.952	33.993
3	1.027	9.332	47.945	1.027	9.332	47.945	1.535	13.951	47.945
4	.970	8.816	56.761						
5	.838	7.614	64.375						
6	.791	7.191	71.565						
7	.741	6.739	78.305						
8	.720	6.549	84.854						
9	.592	5.385	90.239						
10	.559	5.081	95.320						
11	.515	4.680	100.000						

Extraction Method: Principal Component Analysis.

APPENDIX H: LEVENE'S TEST FOR EQUALITY OF VARIANCES

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
INC_GAP	Equal variances assumed	569.963	.000	-34.712	12098	.000	-16.46549	.47434	-17.39528	-15.53570
	Equal variances not assumed			-41.797	8267.618	.000	-16.46549	.39394	-17.23771	-15.69327

APPENDIX I: REGRESSION MODEL, GENDER AND INCOME GAP

Variables Entered/Removed(b)

Model	Variables Entered	Variables Removed	Method
1	gender1(a)	.	Enter

a All requested variables entered.
b Dependent Variable: INC_GAP

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.301(a)	.091	.091	22.89645	.091	1204.928	1	12098	.000

a Predictors: (Constant), gender1

ANOVA(b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	631680.498	1	631680.498	1204.928	.000(a)
	Residual	6342346.394	12098	524.248		
	Total	6974026.893	12099			

a Predictors: (Constant), gender1
b Dependent Variable: INC_GAP

Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	33.665	.408		82.522	.000
	gender1	16.465	.474	.301	34.712	.000

a Dependent Variable: INC_GAP

APPENDIX J: CRONBACH'S ALPHA FOR SPECIALIZATION LATENT CONSTRUCTS

Reliability Statistics (IT Use)

Cronbach's Alpha	N of Items
.605	4

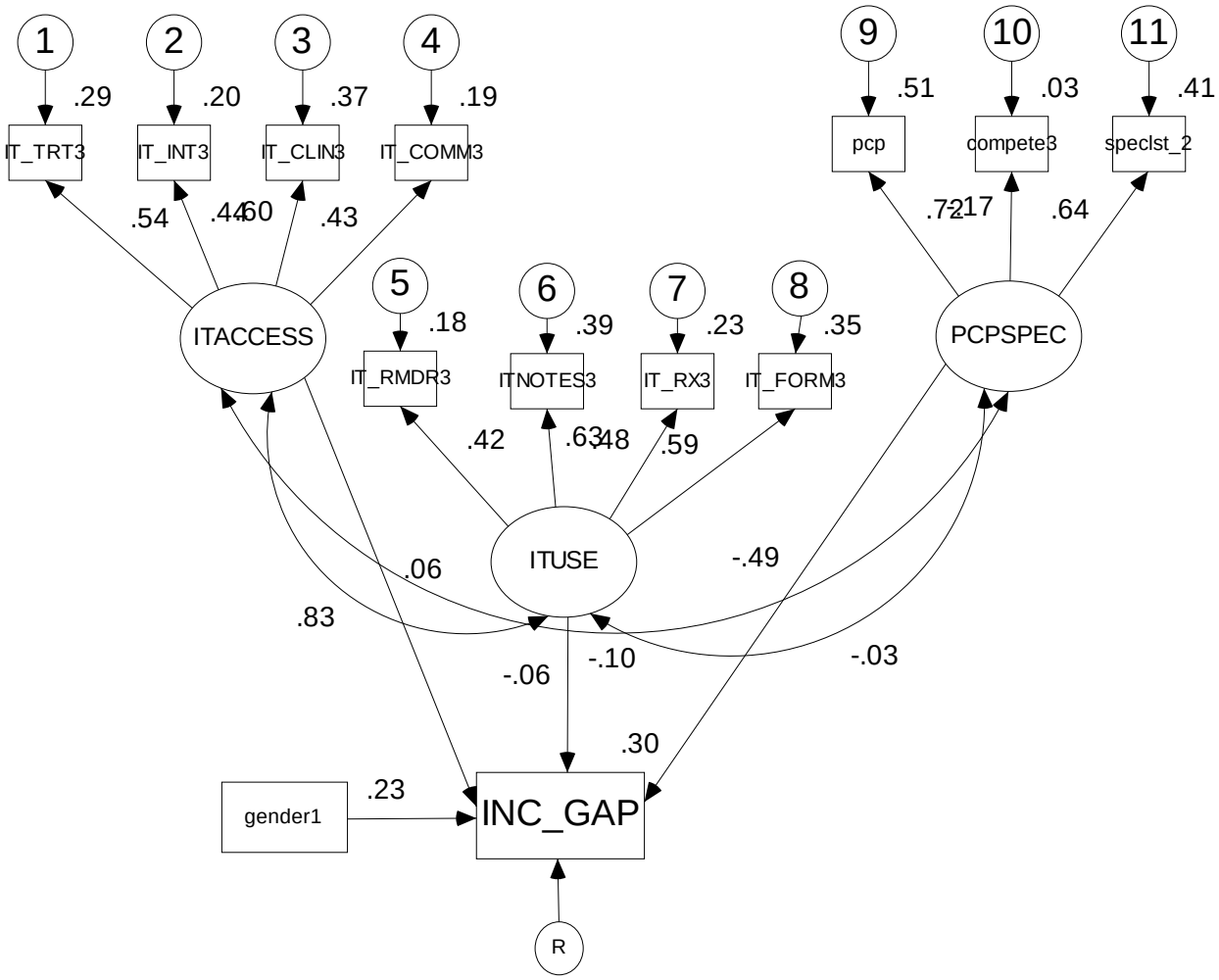
Reliability Statistics (IT Access)

Cronbach's Alpha	N of Items
.584	4

Reliability Statistics (PCP Specialist)

Cronbach's Alpha	N of Items
.134	3

APPENDIX K: AMOS MODEL FOR SPECIALIZATION



APPENDIX L: STEPWISE REGRESION FOR SPECIALIZATION MODEL

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.390(a)	.152	.152	22.10697	.152	2172.037	1	12098	.000
2	.460(b)	.212	.212	21.31775	.060	913.364	1	12097	.000
3	.490(c)	.240	.240	20.92912	.029	454.423	1	12096	.000
4	.495(d)	.245	.245	20.86761	.005	72.412	1	12095	.000
5	.496(e)	.246	.245	20.85715	.001	13.135	1	12094	.000
6	.496(f)	.246	.246	20.85056	.001	8.647	1	12093	.003

a Predictors: (Constant), pcp
b Predictors: (Constant), pcp, gender1
c Predictors: (Constant), pcp, gender1, speclst_2
d Predictors: (Constant), pcp, gender1, speclst_2, IT_INT3
e Predictors: (Constant), pcp, gender1, speclst_2, IT_INT3, compete3
f Predictors: (Constant), pcp, gender1, speclst_2, IT_INT3, compete3, IT_TRT3

ANOVA(g)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1061514.121	1	1061514.121	2172.037	.000(a)
	Residual	5912512.772	12098	488.718		
	Total	6974026.893	12099			
2	Regression	1476589.246	2	738294.623	1624.602	.000(b)
	Residual	5497437.647	12097	454.446		
	Total	6974026.893	12099			
3	Regression	1675639.342	3	558546.447	1275.138	.000(c)
	Residual	5298387.551	12096	438.028		
	Total	6974026.893	12099			
4	Regression	1707171.869	4	426792.967	980.103	.000(d)
	Residual	5266855.024	12095	435.457		
	Total	6974026.893	12099			
5	Regression	1712885.974	5	342577.195	787.496	.000(e)
	Residual	5261140.919	12094	435.021		
	Total	6974026.893	12099			
6	Regression	1716645.300	6	286107.550	658.103	.000(f)
	Residual	5257381.592	12093	434.746		
	Total	6974026.893	12099			

a Predictors: (Constant), pcp
b Predictors: (Constant), pcp, gender1
c Predictors: (Constant), pcp, gender1, speclst_2
d Predictors: (Constant), pcp, gender1, speclst_2, IT_INT3
e Predictors: (Constant), pcp, gender1, speclst_2, IT_INT3, compete3
f Predictors: (Constant), pcp, gender1, speclst_2, IT_INT3, compete3, IT_TRT3
g Dependent Variable: INC_GAP

Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients			Correlations			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	58.138	.332		175.315	.000					
	pcp	-19.430	.417	-.390	-46.605	.000	-.390	-.390	-.390	1.000	1.000
2	(Constant)	46.953	.489		95.995	.000					
	pcp	-17.542	.407	-.352	-43.118	.000	-.390	-.365	-.348	.976	1.024
	gender1	13.507	.447	.247	30.222	.000	.301	.265	.244	.976	1.024
3	(Constant)	57.826	.701		82.546	.000					
	pcp	-13.299	.446	-.267	-29.800	.000	-.390	-.262	-.236	.782	1.278
	gender1	12.553	.441	.229	28.462	.000	.301	.251	.226	.966	1.035
	speclst_2	-14.492	.680	-.191	-21.317	.000	-.351	-.190	-.169	.781	1.281
4	(Constant)	54.949	.776		70.810	.000					
	pcp	-13.096	.446	-.263	-29.390	.000	-.390	-.258	-.232	.780	1.282
	gender1	12.384	.440	.226	28.133	.000	.301	.248	.222	.964	1.037
	speclst_2	-14.430	.678	-.190	-21.288	.000	-.351	-.190	-.168	.781	1.281
	IT_INT3	3.751	.441	.067	8.510	.000	.109	.077	.067	.992	1.008
5	(Constant)	53.827	.835		64.454	.000					
	pcp	-13.046	.446	-.262	-29.278	.000	-.390	-.257	-.231	.779	1.283
	gender1	12.299	.441	.225	27.913	.000	.301	.246	.220	.962	1.040
	speclst_2	-14.183	.681	-.187	-20.828	.000	-.351	-.186	-.164	.773	1.294
	IT_INT3	3.721	.441	.067	8.446	.000	.109	.077	.067	.992	1.008
	compete3	1.462	.403	.029	3.624	.000	.099	.033	.029	.976	1.024
6	(Constant)	54.004	.837		64.518	.000					
	pcp	-13.071	.446	-.262	-29.338	.000	-.390	-.258	-.232	.779	1.284
	gender1	12.291	.440	.225	27.903	.000	.301	.246	.220	.962	1.040
	speclst_2	-14.061	.682	-.186	-20.617	.000	-.351	-.184	-.163	.770	1.299
	IT_INT3	4.165	.466	.075	8.945	.000	.109	.081	.071	.888	1.126
	compete3	1.489	.403	.030	3.692	.000	.099	.034	.029	.976	1.025
	IT_TRT3	-1.181	.402	-.025	-2.941	.003	-.001	-.027	-.023	.892	1.121

a Dependent Variable: INC_GAP

APPENDIX M: STEPWISE REGRESSION FOR SPECIALIZATION, MODEL FOR FEMALES AND MODEL FOR MALES

Model Summary

gender1	Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
						R Square Change	F Change	df1	df2	Sig. F Change
.00	1	.278(a)	.077	.077	15.87996	.077	264.101	1	3148	.000
	2	.291(b)	.084	.084	15.82199	.007	24.112	1	3147	.000
	3	.295(c)	.087	.086	15.80265	.003	8.707	1	3146	.003
	4	.298(d)	.089	.088	15.78780	.002	6.920	1	3145	.009
1.00	1	.385(a)	.148	.148	22.84411	.148	1556.684	1	8948	.000
	2	.424(b)	.180	.180	22.41570	.032	346.302	1	8947	.000
	3	.431(c)	.186	.186	22.33413	.006	66.469	1	8946	.000
	4	.433(e)	.187	.187	22.32009	.001	12.259	1	8945	.000
	5	.433(f)	.188	.187	22.31565	.000	4.558	1	8944	.033

a Predictors: (Constant), pcp
b Predictors: (Constant), pcp, speclst_2
c Predictors: (Constant), pcp, speclst_2, IT_INT3
d Predictors: (Constant), pcp, speclst_2, IT_INT3, IT_TRT3
e Predictors: (Constant), pcp, speclst_2, IT_INT3, compete3
f Predictors: (Constant), pcp, speclst_2, IT_INT3, compete3, IT_TRT3

APPENDIX N: STEPWISE REGRESSION WITH CONTROL VARIABLES

Model Summary

gender1	Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
						R Square Change	F Change	df1	df2	Sig. F Change
.00	1	.278(a)	.077	.077	15.87996	.077	264.101	1	3148	.000
	2	.306(b)	.094	.093	15.74197	.016	56.431	1	3147	.000
	3	.315(c)	.099	.098	15.69597	.006	19.473	1	3146	.000
	4	.323(d)	.104	.103	15.65389	.005	17.936	1	3145	.000
	5	.327(e)	.107	.105	15.63395	.003	9.028	1	3144	.003
	6	.330(f)	.109	.107	15.62132	.002	6.087	1	3143	.014
	7	.332(g)	.110	.108	15.60942	.002	5.794	1	3142	.016
	8	.334(h)	.112	.110	15.59873	.002	5.306	1	3141	.021
	9	.336(i)	.113	.110	15.59162	.001	3.868	1	3140	.049
1.00	1	.385(a)	.148	.148	22.84411	.148	1556.684	1	8948	.000
	2	.427(b)	.183	.183	22.37793	.035	377.699	1	8947	.000
	3	.455(j)	.207	.207	22.04206	.024	275.741	1	8946	.000
	4	.474(k)	.224	.224	21.80337	.017	197.940	1	8945	.000
	5	.480(l)	.230	.230	21.72156	.006	68.511	1	8944	.000
	6	.482(m)	.232	.232	21.69368	.002	24.001	1	8943	.000
	7	.483(n)	.234	.233	21.67388	.001	17.346	1	8942	.000
	8	.485(o)	.235	.234	21.66088	.001	11.738	1	8941	.001
	9	.485(p)	.236	.235	21.65058	.001	9.511	1	8940	.002
	10	.486(q)	.236	.235	21.64089	.001	9.008	1	8939	.003
	11	.487(r)	.237	.236	21.63125	.001	8.963	1	8938	.003
	12	.488(s)	.238	.237	21.62181	.001	8.807	1	8937	.003
	13	.488(t)	.238	.237	21.61733	.000	4.705	1	8936	.030

Models tested:

a Predictors: (Constant), pcp

b Predictors: (Constant), pcp, ownership

c Predictors: (Constant), pcp, ownership, boardcrt

d Predictors: (Constant), pcp, ownership, boardcrt, speclst_2

e Predictors: (Constant), pcp, ownership, boardcrt, speclst_2, IT_INT3

f Predictors: (Constant), pcp, ownership, boardcrt, speclst_2, IT_INT3, IT_TRT3

g Predictors: (Constant), pcp, ownership, boardcrt, speclst_2, IT_INT3, IT_TRT3, age_yrs

h Predictors: (Constant), pcp, ownership, boardcrt, speclst_2, IT_INT3, IT_TRT3, age_yrs, race3

i Predictors: (Constant), pcp, ownership, boardcrt, speclst_2, IT_INT3, IT_TRT3, age_yrs, race3, PMC

j Predictors: (Constant), pcp, ownership, speclst_2

k Predictors: (Constant), pcp, ownership, speclst_2, boardcrt

l Predictors: (Constant), pcp, ownership, speclst_2, boardcrt, IT_INT3

m Predictors: (Constant), pcp, ownership, speclst_2, boardcrt, IT_INT3, age_yrs

n Predictors: (Constant), pcp, ownership, speclst_2, boardcrt, IT_INT3, age_yrs, race3

o Predictors: (Constant), pcp, ownership, speclst_2, boardcrt, IT_INT3, age_yrs, race3, nopay3

p Predictors: (Constant), pcp, ownership, speclst_2, boardcrt, IT_INT3, age_yrs, race3, nopay3, regions1

q Predictors: (Constant), pcp, ownership, speclst_2, boardcrt, IT_INT3, age_yrs, race3, nopay3, regions1, IT_CLIN3

r Predictors: (Constant), pcp, ownership, speclst_2, boardcrt, IT_INT3, age_yrs, race3, nopay3, regions1, IT_CLIN3, IT_TRT3

s Predictors: (Constant), pcp, ownership, speclst_2, boardcrt, IT_INT3, age_yrs, race3, nopay3, regions1, IT_CLIN3, IT_TRT3, charity3

t Predictors: (Constant), pcp, ownership, speclst_2, boardcrt, IT_INT3, age_yrs, race3, nopay3, regions1, IT_CLIN3, IT_TRT3, charity3, metro

Coefficients(a)

gender1	Model		Standardized Coefficients Beta	t	Sig.	95% Confidence Interval for B Lower Bound	95% Confidence Interval for B Upper Bound	Correlations Zero-order	Correlations Partial	Correlations Part	Collinearity Statistics Tolerance	Collinearity Statistics VIF
0.00	1	(Constant)		72.741	0.000	40.665	42.918					
		pcp	-0.278	-16.251	0.000	-12.022	-9.433	-0.278	-0.278	-0.278	1.000	1.000
	2	(Constant)		63.572	0.000	38.601	41.058					
		pcp	-0.267	-15.644	0.000	-11.568	-8.991	-0.278	-0.269	-0.265	0.992	1.008
		ownership	0.128	7.512	0.000	3.238	5.525	0.152	0.133	0.127	0.992	1.008
	3	(Constant)		35.283	0.000	34.219	38.246					
		pcp	-0.267	-15.724	0.000	-11.587	-9.018	-0.278	-0.270	-0.266	0.992	1.008
		ownership	0.133	7.831	0.000	3.423	5.710	0.152	0.138	0.133	0.987	1.014
		boardcrt	0.075	4.413	0.000	2.210	5.745	0.061	0.078	0.075	0.995	1.005
	4	(Constant)		22.428	0.000	39.355	46.895					
		pcp	-0.247	-14.027	0.000	-10.854	-8.192	-0.278	-0.243	-0.237	0.919	1.088
		ownership	0.128	7.497	0.000	3.229	5.517	0.152	0.133	0.127	0.981	1.020
		boardcrt	0.072	4.256	0.000	2.065	5.592	0.061	0.076	0.072	0.993	1.007
		speclst_2	-0.075	-4.235	0.000	-10.954	-4.021	-0.158	-0.075	-0.071	0.917	1.091
	5	(Constant)		20.969	0.000	37.727	45.510					
		pcp	-0.245	-13.938	0.000	-10.785	-8.125	-0.278	-0.241	-0.235	0.918	1.090
		ownership	0.130	7.634	0.000	3.309	5.595	0.152	0.135	0.129	0.979	1.022
		boardcrt	0.068	3.990	0.000	1.829	5.366	0.061	0.071	0.067	0.986	1.014
		speclst_2	-0.071	-4.052	0.000	-10.635	-3.699	-0.158	-0.072	-0.068	0.913	1.095
		IT_INT3	0.051	3.005	0.003	0.646	3.073	0.068	0.054	0.051	0.984	1.016
	6	(Constant)		21.066	0.000	37.916	45.698					
		pcp	-0.245	-13.953	0.000	-10.787	-8.129	-0.278	-0.242	-0.235	0.918	1.090
		ownership	0.128	7.520	0.000	3.243	5.530	0.152	0.133	0.127	0.977	1.024
		boardcrt	0.069	4.088	0.000	1.919	5.455	0.061	0.073	0.069	0.984	1.016
		speclst_2	-0.070	-3.987	0.000	-10.515	-3.582	-0.158	-0.071	-0.067	0.913	1.096
		IT_INT3	0.066	3.675	0.000	1.130	3.714	0.068	0.065	0.062	0.867	1.154
		IT_TRT3	-0.044	-2.467	0.014	-2.640	-0.302	-0.023	-0.044	-0.042	0.873	1.146
	7	(Constant)		14.771	0.000	32.861	42.920					
		pcp	-0.241	-13.655	0.000	-10.629	-7.960	-0.278	-0.237	-0.230	0.909	1.101
		ownership	0.120	6.867	0.000	2.923	5.259	0.152	0.122	0.116	0.935	1.070
		boardcrt	0.079	4.540	0.000	2.390	6.024	0.061	0.081	0.076	0.931	1.074

		speclst_2	-0.072	-4.105	0.000	-10.731	-3.794	-0.158	-0.073	-0.069	0.910	1.099
		IT_INT3	0.070	3.852	0.000	1.249	3.839	0.068	0.069	0.065	0.861	1.161
		IT_TRT3	-0.043	-2.408	0.016	-2.603	-0.266	-0.023	-0.043	-0.041	0.872	1.147
		age_yrs	0.043	2.407	0.016	0.016	0.152	0.069	0.043	0.041	0.876	1.141
	8	(Constant)		14.938	0.000	33.437	43.542					
		pcp	-0.243	-13.764	0.000	-10.711	-8.040	-0.278	-0.239	-0.231	0.906	1.103
		ownership	0.120	6.879	0.000	2.928	5.262	0.152	0.122	0.116	0.935	1.070
		boardcrt	0.084	4.797	0.000	2.647	6.307	0.061	0.085	0.081	0.916	1.092
		speclst_2	-0.071	-4.033	0.000	-10.601	-3.666	-0.158	-0.072	-0.068	0.909	1.100
		IT_INT3	0.071	3.924	0.000	1.297	3.886	0.068	0.070	0.066	0.861	1.162
		IT_TRT3	-0.042	-2.354	0.019	-2.570	-0.234	-0.023	-0.042	-0.040	0.872	1.147
		age_yrs	0.044	2.454	0.014	0.017	0.154	0.069	0.044	0.041	0.876	1.142
		race3	-0.039	-2.303	0.021	-2.653	-0.213	-0.017	-0.041	-0.039	0.978	1.022
	9	(Constant)		14.408	0.000	32.513	42.755					
		pcp	-0.247	-13.906	0.000	-10.880	-8.191	-0.278	-0.241	-0.234	0.893	1.119
		ownership	0.120	6.894	0.000	2.935	5.268	0.152	0.122	0.116	0.935	1.070
		boardcrt	0.082	4.669	0.000	2.532	6.197	0.061	0.083	0.078	0.913	1.096
		speclst_2	-0.071	-4.029	0.000	-10.589	-3.657	-0.158	-0.072	-0.068	0.909	1.100
		IT_INT3	0.070	3.887	0.000	1.272	3.860	0.068	0.069	0.065	0.860	1.162
		IT_TRT3	-0.042	-2.343	0.019	-2.562	-0.227	-0.023	-0.042	-0.039	0.872	1.147
		age_yrs	0.045	2.518	0.012	0.019	0.156	0.069	0.045	0.042	0.875	1.143
		race3	-0.039	-2.305	0.021	-2.653	-0.214	-0.017	-0.041	-0.039	0.978	1.022
		PMC	0.033	1.967	0.049	0.000	0.039	0.001	0.035	0.033	0.977	1.024
1.00	1	(Constant)		163.399	0.000	60.794	62.270					
		pcp	-0.385	-39.455	0.000	-20.324	-18.400	-0.385	-0.385	-0.385	1.000	1.000
	2	(Constant)		117.029	0.000	54.757	56.622					
		pcp	-0.372	-38.881	0.000	-19.678	-17.789	-0.385	-0.380	-0.372	0.995	1.005
		ownership	0.186	19.434	0.000	8.408	10.295	0.211	0.201	0.186	0.995	1.005
	3	(Constant)		90.556	0.000	63.227	66.025					
		pcp	-0.287	-26.747	0.000	-15.508	-13.390	-0.385	-0.272	-0.252	0.768	1.302
		ownership	0.167	17.518	0.000	7.431	9.304	0.211	0.182	0.165	0.980	1.020
		speclst_2	-0.180	-16.605	0.000	-14.201	-11.202	-0.341	-0.173	-0.156	0.757	1.322
	4	(Constant)		56.999	0.000	53.371	57.173					
		pcp	-0.275	-25.819	0.000	-14.892	-12.791	-0.385	-0.263	-0.240	0.763	1.310
		ownership	0.172	18.310	0.000	7.732	9.586	0.211	0.190	0.171	0.978	1.022
		boardcrt	0.132	14.069	0.000	8.414	11.138	0.169	0.147	0.131	0.986	1.014

	speclst_2	-0.175	-16.316	0.000	-13.836	-10.868	-0.341	-0.170	-0.152	0.756	1.323
5	(Constant)		49.627	0.000	49.888	53.992					
	pcp	-0.270	-25.418	0.000	-14.645	-12.548	-0.385	-0.260	-0.236	0.761	1.314
	ownership	0.177	18.826	0.000	7.959	9.810	0.211	0.195	0.175	0.975	1.026
	boardcrt	0.125	13.337	0.000	7.907	10.631	0.169	0.140	0.124	0.978	1.022
	speclst_2	-0.174	-16.332	0.000	-13.796	-10.840	-0.341	-0.170	-0.152	0.756	1.323
	IT_INT3	0.077	8.277	0.000	3.456	5.601	0.105	0.087	0.077	0.983	1.017
6	(Constant)		35.719	0.000	54.849	61.219					
	pcp	-0.273	-25.673	0.000	-14.783	-12.685	-0.385	-0.262	-0.238	0.759	1.318
	ownership	0.184	19.369	0.000	8.298	10.166	0.211	0.201	0.179	0.953	1.049
	boardcrt	0.115	12.020	0.000	7.143	9.927	0.169	0.126	0.111	0.935	1.070
	speclst_2	-0.175	-16.391	0.000	-13.823	-10.870	-0.341	-0.171	-0.152	0.756	1.323
	IT_INT3	0.072	7.618	0.000	3.115	5.274	0.105	0.080	0.071	0.968	1.033
	age_yrs	-0.048	-4.899	0.000	-0.156	-0.067	-0.035	-0.052	-0.045	0.911	1.098
7	(Constant)		34.198	0.000	53.408	59.902					
	pcp	-0.272	-25.557	0.000	-14.714	-12.618	-0.385	-0.261	-0.237	0.758	1.319
	ownership	0.184	19.366	0.000	8.289	10.156	0.211	0.201	0.179	0.953	1.049
	boardcrt	0.110	11.441	0.000	6.775	9.577	0.169	0.120	0.106	0.921	1.086
	speclst_2	-0.174	-16.307	0.000	-13.751	-10.800	-0.341	-0.170	-0.151	0.755	1.324
	IT_INT3	0.071	7.531	0.000	3.065	5.223	0.105	0.079	0.070	0.968	1.033
	age_yrs	-0.051	-5.247	0.000	-0.165	-0.075	-0.035	-0.055	-0.049	0.904	1.106
	race3	0.039	4.165	0.000	1.317	3.658	0.081	0.044	0.039	0.976	1.025
8	(Constant)		31.177	0.000	51.237	58.112					
	pcp	-0.270	-25.348	0.000	-14.615	-12.517	-0.385	-0.259	-0.235	0.756	1.323
	ownership	0.185	19.499	0.000	8.354	10.221	0.211	0.202	0.180	0.952	1.051
	boardcrt	0.111	11.500	0.000	6.814	9.614	0.169	0.121	0.106	0.921	1.086
	speclst_2	-0.172	-16.129	0.000	-13.625	-10.672	-0.341	-0.168	-0.149	0.753	1.327
	IT_INT3	0.069	7.357	0.000	2.971	5.130	0.105	0.078	0.068	0.966	1.036
	age_yrs	-0.051	-5.223	0.000	-0.164	-0.075	-0.035	-0.055	-0.048	0.904	1.106
	race3	0.040	4.269	0.000	1.378	3.719	0.081	0.045	0.039	0.975	1.026
	nopay3	0.032	3.426	0.001	0.896	3.293	0.066	0.036	0.032	0.985	1.015
9	(Constant)		30.374	0.000	50.378	57.328					
	pcp	-0.271	-25.465	0.000	-14.683	-12.584	-0.385	-0.260	-0.235	0.755	1.325
	ownership	0.185	19.478	0.000	8.340	10.207	0.211	0.202	0.180	0.952	1.051
	boardcrt	0.110	11.432	0.000	6.764	9.564	0.169	0.120	0.106	0.920	1.086
	speclst_2	-0.172	-16.107	0.000	-13.603	-10.651	-0.341	-0.168	-0.149	0.753	1.327

	IT_INT3	0.070	7.428	0.000	3.010	5.168	0.105	0.078	0.069	0.965	1.036
	age_yrs	-0.053	-5.430	0.000	-0.169	-0.079	-0.035	-0.057	-0.050	0.899	1.112
	race3	0.040	4.248	0.000	1.366	3.706	0.081	0.045	0.039	0.975	1.026
	nopay3	0.031	3.354	0.001	0.852	3.248	0.066	0.035	0.031	0.985	1.016
	regions1	0.029	3.084	0.002	0.196	0.879	0.017	0.033	0.029	0.992	1.008
10	(Constant)		29.922	0.000	49.814	56.798					
	pcp	-0.269	-25.187	0.000	-14.567	-12.463	-0.385	-0.257	-0.233	0.751	1.332
	ownership	0.190	19.712	0.000	8.576	10.470	0.211	0.204	0.182	0.924	1.083
	boardcrt	0.110	11.386	0.000	6.730	9.528	0.169	0.120	0.105	0.920	1.087
	speclst_2	-0.172	-16.128	0.000	-13.612	-10.662	-0.341	-0.168	-0.149	0.753	1.327
	IT_INT3	0.064	6.651	0.000	2.638	4.843	0.105	0.070	0.061	0.924	1.082
	age_yrs	-0.052	-5.356	0.000	-0.167	-0.078	-0.035	-0.057	-0.050	0.899	1.112
	race3	0.039	4.211	0.000	1.343	3.682	0.081	0.044	0.039	0.975	1.026
	nopay3	0.031	3.297	0.001	0.817	3.213	0.066	0.035	0.030	0.984	1.016
	regions1	0.029	3.166	0.002	0.210	0.894	0.017	0.033	0.029	0.991	1.009
	IT_CLIN3	0.029	3.001	0.003	0.512	2.441	0.047	0.032	0.028	0.910	1.099
11	(Constant)		30.061	0.000	50.132	57.126					
	pcp	-0.269	-25.223	0.000	-14.580	-12.477	-0.385	-0.258	-0.233	0.751	1.332
	ownership	0.190	19.776	0.000	8.605	10.498	0.211	0.205	0.183	0.923	1.083
	boardcrt	0.110	11.443	0.000	6.768	9.566	0.169	0.120	0.106	0.920	1.087
	speclst_2	-0.170	-15.906	0.000	-13.468	-10.513	-0.341	-0.166	-0.147	0.750	1.333
	IT_INT3	0.072	7.198	0.000	3.045	5.324	0.105	0.076	0.066	0.864	1.158
	IT_TRT3	-0.030	-2.994	0.003	-2.474	-0.516	0.001	-0.032	-0.028	0.840	1.190
	age_yrs	-0.054	-5.513	0.000	-0.171	-0.081	-0.035	-0.058	-0.051	0.896	1.116
	race3	0.039	4.201	0.000	1.336	3.674	0.081	0.044	0.039	0.975	1.026
	nopay3	0.031	3.352	0.001	0.850	3.245	0.066	0.035	0.031	0.984	1.016
	regions1	0.029	3.074	0.002	0.194	0.878	0.017	0.033	0.028	0.990	1.010
	IT_CLIN3	0.036	3.628	0.000	0.844	2.829	0.047	0.038	0.034	0.859	1.164
12	(Constant)		29.114	0.000	49.155	56.252					
	pcp	-0.270	-25.333	0.000	-14.644	-12.541	-0.385	-0.259	-0.234	0.749	1.334
	ownership	0.184	18.772	0.000	8.288	10.221	0.211	0.195	0.173	0.885	1.130
	boardcrt	0.110	11.434	0.000	6.759	9.555	0.169	0.120	0.106	0.920	1.087
	speclst_2	-0.167	-15.610	0.000	-13.285	-10.321	-0.341	-0.163	-0.144	0.745	1.342
	IT_INT3	0.072	7.201	0.000	3.045	5.323	0.105	0.076	0.066	0.864	1.158
	IT_TRT3	-0.032	-3.126	0.002	-2.541	-0.582	0.001	-0.033	-0.029	0.839	1.192
	age_yrs	-0.053	-5.377	0.000	-0.168	-0.078	-0.035	-0.057	-0.050	0.894	1.118

		race3	0.040	4.225	0.000	1.350	3.687	0.081	0.045	0.039	0.975	1.026
		nopay3	0.027	2.877	0.004	0.566	2.986	0.066	0.030	0.027	0.962	1.039
		regions1	0.028	2.965	0.003	0.175	0.859	0.017	0.031	0.027	0.989	1.012
		IT_CLIN3	0.036	3.660	0.000	0.860	2.844	0.047	0.039	0.034	0.859	1.164
		charity3	0.029	2.968	0.003	0.532	2.603	0.096	0.031	0.027	0.923	1.083
	13	(Constant)		24.853	0.000	51.167	59.929					
		pcp	-0.270	-25.327	0.000	-14.639	-12.536	-0.385	-0.259	-0.234	0.749	1.334
		ownership	0.184	18.766	0.000	8.284	10.216	0.211	0.195	0.173	0.885	1.130
		boardcrt	0.111	11.495	0.000	6.803	9.601	0.169	0.121	0.106	0.919	1.088
		speclst_2	-0.167	-15.622	0.000	-13.292	-10.328	-0.341	-0.163	-0.144	0.745	1.342
		IT_INT3	0.072	7.217	0.000	3.054	5.331	0.105	0.076	0.067	0.864	1.158
		IT_TRT3	-0.032	-3.144	0.002	-2.550	-0.591	0.001	-0.033	-0.029	0.839	1.192
		age_yrs	-0.051	-5.259	0.000	-0.166	-0.076	-0.035	-0.056	-0.049	0.892	1.121
		race3	0.038	4.110	0.000	1.283	3.623	0.081	0.043	0.038	0.972	1.028
		nopay3	0.025	2.667	0.008	0.438	2.868	0.066	0.028	0.025	0.954	1.048
		regions1	0.031	3.313	0.001	0.240	0.935	0.017	0.035	0.031	0.955	1.047
		IT_CLIN3	0.037	3.723	0.000	0.892	2.876	0.047	0.039	0.034	0.858	1.165
		charity3	0.028	2.901	0.004	0.497	2.568	0.096	0.031	0.027	0.923	1.084
		metro	-0.021	-2.169	0.030	-2.023	-0.102	-0.026	-0.023	-0.020	0.951	1.051

a. Dependent Variable: INC_GAP

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