THE RELATIONSHIP BETWEEN CULTURAL SENTIMENTS ABOUT GENDER AND OCCUPATIONS AND THE GENDER COMPOSITION OF OCCUPATIONS

by

JUN ZHAO

(Under the Direction of Dr. Dawn T. Robinson)

ABSTRACT

Building on prior theories of gender segregation in the labor market, this thesis investigates the mutually reinforcing forces of gender segregation at the macro-level – specifically, cultural beliefs about gender and occupational identities and structural arrangement of employment. I hypothesized that changes in gender distributions within occupations would be predicted by the distance in cultural meanings between gender and occupational identities and that those distributional changes would, in turn result in future changes in cultural meanings about gender and/or occupations. My data were only sufficient to test the first part of that argument and did not support the hypotheses. The (dis)consonance between gender identity and occupational identities meaning does not predict changes in the gender distributions within occupations over time, even after controlling for the main effects of the identities meanings. With new wave of data collected underway, studies can test the hypothesized reciprocal relationship in the future.

INDEX WORDS: gender segregation, affective meaning, reciprocal relationship

THE RELATIONSHIP BETWEEN CULTURAL SENTIMENTS ABOUT GENDER AND OCCUPATIONS AND THE GENDER COMPOSITION OF OCCUPATIONS

by

JUN ZHAO

LLB, SOUTH CHINA AGRICULTURAL UNIVERSITY, CHINA, 2007

LLM, SUN YAT-SEN UNIVERSITY, CHINA, 2009

A Thesis Submitted to the Graduate Faculty of The University of Georgia in Partial Fulfillment of the Requirements for the Degree

MASTER OF ARTS

ATHENS, GEORGIA

2012

THE RELATIONSHIP BETWEEN CULTURAL SENTIMENTS ABOUT GENDER AND OCCUPATIONS AND THE GENDER COMPOSITION OF OCCUPATIONS

by

JUN ZHAO

Major Professor:	Dawn T. Robinson
Committee:	Jody Clay-Warner Jeremy Reynolds

Electronic Version Approved:

Maureen Grasso
Dean of the Graduate School
The University of Georgia
December 2012

TABLE OF CONTENTS

LIST OF TABLES

Page

LIST OF FIGURES

Page

CHAPTER 1

INTRODUCTION

How can we explain the persistence of gender segregation in our society over the major historical transformation in its socioeconomic base? If women's lower rates of participation in the labor market, along with a skewed occupational structure toward male occupations (i.e., low labor demand for women), are the reasons that occupation segregation between sexes was prevalent in 1950s and 1960s (Valerie 1970), the past decades have been marked by notable changes in women's labor force activities and occupational structure. For example, women's labor force participation is significantly higher today than it was in the 1970s, with 59.2 percent of women in the labor force in 2009 (Solis and Hall 2010). Moreover, a dual process featured by women's movement into several "male-labeled" occupations (Reskin and Roos 1990) and the increasing demand for female labor in the occupational structure (Cotter, Hermsen, and Vanneman 2001) has become the engine driving occupational integration.

However, despite some decline in sex segregation in recent decades in industrialized countries, women are still facing huge inequality in the labor market. There are few female construction managers and chemists, while many occupations are still almost totally dominated by women. According to the data from the Bureau of Labor Statistics, 98 percent and 92 percent of secretaries and nurses are women, whereas only one and five percent of airline pilots and truck drivers are men in 2009 (Solis and Hall 2010).

To capture the complex patterns of change in segregation over time and place, labor market researchers quantify sex segregation using measures of dissimilarity (D). The index of

dissimilarity can be defined as: $D = 1/2 \times \Sigma|A_i /X - B_i /Y|$ where A_i and B_i are the number of men and women in occupation *i*, X and Y is the equivalent sum for A_i and Bi (Duncan and Duncan 1955a; Duncan and Duncan 1955b). A dissimilarity score of 30 means that 30 percent of women would have to change occupations in order to achieve parity. Although segregation levels may have fallen from a dissimilarity of 62 in 1960 to 47 in 2001 based on the calculation of the formula, the latter figure still implies substantial occupational separation between men and women (Massey 2006). All of these data make us believe that there are other processes or factors scholars have yet to capture.

Various theories and research strategies have uncovered the segregative dynamics that shape women's employment (e.g. Reskin and Roos 1990). Research on gender segregation at the macro-level usually focuses on either structural component of the labor market, such as labor market characteristics in general (Kaufman 2002), or cultural explanations (Reeves Sanday 1981) of changing labor force patterns, or putting them into one model to test the relative explanatory power between the two forces. Though this scholarship has fruitfully advanced our understanding of gender-based segregation, such a narrow focus on only one aspect of occupational segregation, whether it be norms, state regulations, or organizational characteristics, may limit the general explanatory power of these theories. What is needed is more careful attention to the ways in which macro-level cultural and structural forces *interact*, instead of *compete*, with each other. Together the macro-level factors with several micro-level factors will affect the changes in labor market behavior.

Although cultural beliefs have long been thought to serve important motivational functions in terms of preserving existing social structure while social structure has been believed to exert its power on cultural beliefs in terms of framing discourse and perception, their reciprocal

relationship has received little empirical attention. In this paper, the structural focus is placed on a distinct aspect of women's employment: women's proportional gains (percentage of female occupants) in each occupation over time[1], whereas a new approach was adopted to measure the cultural component of sex segregation, namely cultural beliefs about gender and occupational identity. This thesis will use labor market panel data combined with information about the cultural meanings associated with gender and occupational identities to addressing structure-culture relationship in the domain of gender and occupations.

To examine the reciprocal between cultural and structural forces that foster the persistence of occupational segregation, one must first call upon two predominant theoretical domains that conventionally attend to this issue: gender theories either in cultural perspective or in social structural perspective (Cejka and Eagly 1999; Eagly and Wendy 1999; Ridgeway and Smith-Lovin 1999) and sex segregation in stratification literature (Kaufman 2002; Reskin and Roos 1990; Rich 1995). In addition, this study proposes a third perspective to look into the sex segregated employment, namely, cultural sentiment of gender and occupational identities.

Following the structural symbolic interactionist tradition (Mackinnon and Langford 1994), I argue that the affective meanings of gender identity and occupational identity should be included when looking at sex segregation in labor market because first, theoretically it offers insight to existing literacy by adding affect to the inequality dialogue; and second, methodologically past research has yet to reach a consensus about the standardized measurement of cultural beliefs. Thanks to a new approach formulated by affect control theorists measuring the subjective

[1] Some studies also refer this as feminization process defined as women's proportional gains in any paid employment category (Rich 1995). However, I argue the term feminization only covers one of the four fundamental and distinct segregative processes in paid employment: feminization, female-predominant stability, masculinization, and male-predominant stability. In my data, the direction of change in sex composition includes four of them, instead of only the one that is towards increasing proportions of women. So I refer the structural process as women's proportional gains in each occupation in general.

evaluation of identities, we now have a powerful tool that allow scholars to advance their understandings of the complexities involved in the changing labor force.

In this thesis I will develop arguments about the reciprocal relationship between cultural beliefs about gender and occupational identities and the changing landscape of sex composition within occupations. I begin with a review of the scholarly literature separated into three major sections. Beginning with the debate about the origins of sex differences in behavior, social structural perspective of gender and the cultural beliefs in gender research are highlighted and discussed in great detail. Subsequently, I turn to another line of stratification theories specifying the causes for occupational segregation, along the line of the theoretical split between supply-side and demand-side emphases. In the third part of the review, I provide a critique of the research in the past and present a creative approach measuring affective meaning of both gender and occupational identities developed by affect control theorists. The relationship between cultural beliefs about gender and occupational identity and social structure of sex composition in occupations are investigated with this new approach. After the description of data and method, the results are analyzed and displayed in a series of regression model of change scores. The thesis concludes with discussion and limitations.

CHAPTER 2

LITERATURE REVIEW

Gender in a Social Structural Perspective

Origin theory of sex differences

Debates about the basic or ultimate cause of sex differences in social behavior have developed into two types of origin theories (Archer 1996): evolutionary psychological perspective of gender and social structural perspective of gender. Theories proposed by evolutionary psychologists view human beings as evolved actors whose physiological and psychological traits are so equipped because of natural and sexual selection. Cognition and behavior of men and women are evolved to help them survive and reproduce in the evolutionary past. It is the evolutionary adaptation to environment that causes psychological dispositions differed by sexes (Buss 1995). For example, the evolutionary psychological theory of parental investment posits that because women are responsible for the biological resources and time necessary for gestation and child nursing, they invest more in reproduction than men (Trivers and Willard 1973). Cultural content, therefore is influenced by these evolved predispositions (Wilson 1978) and promotes young female deference to adult males in interaction (Hopcroft 2009).

The opposing perspective, however, argues because men and women tend to occupy different social roles, they become psychologically different in ways that facilitate their adaptation to social roles. This type of origin theory is the so-called social structural perspective of gender differences in social behavior. Many feminists and sociologists, such as social role theorists, maintain that gender inequality is socially constructed to some extent (Eagly and

Wendy 1999; Epstein 2007). Despite of their disagreement on the ultimate cause of the sex differences in social behaviors, both evolutionary psychology and social structural perspective do imply a relationship between cultural beliefs and structural arrangement, especially in the latter perspective. While this paper does not focus on reconciling the two theories, I chose to build my theoretical work on social structural perspective given its explicit emphasis on the two components that I try to examine.

According to social structural theorists, it is the division of labor between sexes that serves as the engine for sex-differentiated behavior because it "summarizes the social constraints under which men and women carry out their lives" (Eagly and Wendy 1999). The feature of social structure is often labeled as gender hierarchy, within which contrasting positions of men and women reside. Scholars holding social structural perspectives acknowledge biological differences between sexes to be one of the determinants that sorting men and women into different social roles. Nonetheless, they argue that in a society where few occupational roles require physical attributes claimed by men and greater resilience on maternal child-bearing and child-rearing, the biology explanation could not be the only reason. Instead, social and ecological conditions simultaneously interact with physical sex differences and then jointly place men and women into various positions within social structure.

After being assigned to social roles with different status and power[2], men and women tend to: first produce dominate/subordinate behavior correspond to the social roles they are taken (Ridgeway and Smith-Lovin 1999); and second seek to accommodate sex-typical roles by acquiring the specific skill and resources that facilitate their gender-consistent role performance (Eagly and Steffen 1984; Eagly and Wendy 1999). The second principle is considered to be

[2] Men's specialized activities (warfare, herding) usually yield more power and status.

especially relevant to the current research since it implies a potential function serving as a mechanism for gender beliefs which promote sex segregation in labor market.

To date, the debate of the origin of sex differences in social behavior remains inconclusive. However, careful empirical work done by Eagly and her colleagues (1999) supported the social structural account of sex differences in mate preferences. Other studies done in the controlled experimental lab also found that social interaction constructs gender inequality, women participate less in non-sex typed experimental tasks, have lower level of influence, receive low evaluations of their performance (Carli 1999; Hopcroft 2002; Ridgeway 1991). Workplace inequality, for instance, sex segregated employment, have also been studied by researchers in stratification area. I will discuss this line of research at length later.

Despite considerable speculation and empirical research examining the causal relationship between the structured gender roles and their respective behaviors and beliefs, one issue left unaddressed is the impact of structural change on the meaning of roles and identities. For example, how does the change of sex composition in the labor market alter cultural sentiments of being a man or woman, or a sex-typical role? The interaction between cultural beliefs regarding gender and social roles have emerged from their theory but still quite unclear. Regarding the nature of gender, they also tend to view it as a (status) characteristic at the individual level. The concept of gender as a multilevel system of differences and disadvantages in recent years helps researchers to understand the complexities in a more comprehensive way.

Gender as a multi-level concept

If we take the origin theory of sex difference in social behavior, either evolved psychology or social structural theory, as theories viewing gender as a static characteristic of human being, it is no wonder that “the theoretical reconceptualization of what gender is as a social phenomenon is

among the important recent insights in gender theory" (Ridgeway and Smith-Lovin 1999). Instead of treating gender primarily an identity or role that is taught in childhood and enacted in family relation, gender scholars now understand gender as an institutionalized system for categorizing men and woman, and organizing social relation of inequality on the basis of that difference (Ridgeway 1997; Ridgeway and Correll 2004; Ridgeway and Smith-Lovin 1999). Gender differentiation (Padavic and Reskin 2002; West and Zimmerman 1987), therefore refers to the *social processes* that create and exaggerate biological differences.

Gender differentiation processes can operate at three levels: at the individual level as roles and identities, at interactional level as patterns of behavior and organizational practices, or/and finally at the macro-structural level as cultural beliefs and distributions of resources. Ever since DiMaggio and Powell (1991) advocated that theorists should better understand the way that the systems of human action mediate macro-level outcome, a large body of empirical research has shifted attention to the interactional processes (Ridgeway 1997; Ridgeway and Correll 2004; West and Zimmerman 1987) within the gender system. Theories such as *expectation states* (Berger, Fisek, and Conner 1970; Berger, Rosenholtz, and Jr. 1980; Lovaglia, Lucas, Houser, Thye, and Markovsky 1998) and *affect control theory* (Heise 1979) also propose particular links between features of macro-level systems and systems of action, though the former is more precise in its translation of macro features into cultural knowledge (Ridgeway and Smith-Lovin 1999).

The booming of meso-level analysis of gender system, despite of its revolutionary potential, also encounters critiques. First, scholars argue that the idea of "doing gender" has become a theory of conformity and gender conventionality, albeit of multiple forms of conventionality (Deutsch 2007). Change therefore is ignored, or at least under-elaborated, in their theory.

Another critique or significant limitation of the current trend of gender research is that among the three levels, gender system at the macro-level has received relatively little empirical attention. The lack of sufficient empirical test to ways cultural beliefs manifest itself has hindered the advancement of this filed. Scholars cannot have a full picture of gender segregation if research only examines one or two levels of the multi-level system. Two afore-mention theories (affect control theory and expectation states theory), not gender theory *per se*, do suggest that gender stereotypes may systematically disadvantage women at the structural level (Ridgeway and Smith-Lovin 1999). Yet few studies have investigated the extent to which cultural beliefs about gender might impact men and women under the social structure of labor force arrangement, and vice versa.

Gender ideology, as a traditional way to measure gender on the macro-level, is defined as "a set of widely shared assumption about the way the sexes are and what the relations between them are and ought to be." The content of gender ideology shapes both social norms and general expectations toward men and women regarding their behaviors and gender stereotypes. The few empirical studies that looked at gender ideology (Padavic and Reskin 2002), however, either operationalized it as few categorical concepts, like traditional, transitional, and egalitarian ideologies (Greenstein 2005; Lavee and Katz 2002) or only considered its cognitive components, such as gender stereotypes (Cejka and Eagly 1999). Scholars have yet to reach a consensus of how to measure gender at macro-level and what elements should be included in the operationalization. I propose that the aggregated affective meaning towards gender identity and social roles men and women taken should be all included because, as Mills nicely put it (2003), gender at this level is "a series systems of dominant meanings and symbolism". Specifically, in

the context of sex segregated employment, cultural beliefs about not only gender identity, but also occupational identities become crucial to disentangle the dynamics from two ends.

Only one study of which I am aware employed affective sentiments to measure both gender and occupational identity that prescribed different expectation of *competence* for men and women in the work context (Thebaud 2010). The author found that objective, collectively agreed upon criteria that qualify a person to be an entrepreneur, such as education level, work experiences, or number of social contacts did not present in her sample. Instead, cultural beliefs about gender meaning (self-assessment) and occupation meaning account for the gender gap in business start-ups. By capturing the *competence* aspect of gender meaning, this study provided researcher rich data to understand the processes of gender segregation for the higher positions in an occupational ladder and also shed light on other aspects of affective meaning that scholars could explore.

Perspectives on Occupational Segregation

As Ridgeway (1997) addressed in her paper, "…employment is one of the two interdependent structural foundations on which our present system of gender hierarchy appears to rest" (the other is domestic labor). Gender arrangement in employment is undoubtedly one major domain that interests sociologists and economists. The study of sex segregation in the labor market has been split between demand-side (employers' preferences, dual labor market, queuing theory, etc.) and supply-side (human capital theory, sex-role socialization, etc.) emphases (for a thorough review, see Kaufman 2002, 2010). I argue that the individual-psychological level and macro structural- and cultural- level distinction can also be made within both emphases. Figure 1 categorizes major theories based on two aforementioned factors. In this section, I will mainly

focus on the theories from cultural and structural perspective due to the proposed need at the macro-level in this thesis.

		Supply-side	Demand-side
Macro	Cultural	Sex-role socialization	Statistical discrimination
	Structural	Gender queuing theory	Dual labor market theory Gender queuing theory
Micro	Individual	Human capital	Employer preferences

Figure 1: Categorization of major gender occupational segregation theories based on two factors

Human capital and individual Preferences

Perspectives on gender segregation at the bottom level often look at how credentials and preference of individual, whether it be employers or employees, of group differences between men and women result in segregated sex composition in occupations. Scholars studying human capital (Blau, Ferber, and Winkler 1998) see education, experience, and skills as the major predictors of the matching of workers to job. Because the labor market operates through strict price rationing, skill-productivity characteristics inferred by human capital will enable potential employers maximize their return in the economic sense. To the extent that sex groups differ in their average educational attainment, work experience and on-the-job training, job incumbents will be differentiated by gender (Padavic and Reskin 2002).

With the increasing number of female students enrolled in college, however, female now dominate higher education at every degree level (National Center for Education Statistics). The substitution of female for male workers then should occur when women can offer more stocks of human capital than those offered by men. Empirical studies on sex differences in human capital also found this factor is limited to work experience and on-the-job training (Padavic and Reskin

2002; Tomaskovic-Devey 1993). Studies show that training requirements increase sex segregation but these effects may be diminished by a high demand for workers (Tomaskovic-Devey 1993). In another words, when industries or sectors is booming and expanding, the demand for labor may overcome the restriction of human capital requirement made by employers.

Another approach at the individual level concerns the preference of employer and employee. They contend that women prefer positions that can accommodate their family responsibilities (Marini and Fan 1997). The family structure and compositions condition *choices* among positions. Jobs with more flexibility should be preferred by women with strong family responsibilities. Though sounds reasonable, such a "choice" or preferences arguments have not been strongly supported in the past research because first, its reductionist inclination made it hard to test empirically; and second, personal "choice" have a diminishing effect in labor market arrangement, especially those with formal structures (Padavic and Reskin 2002).

Socialization and Cultural stereotype

Sex-role socialization approaches argue sex segregation in occupations is mainly a consequence of different socialization men and women experienced and cultural stereotypes of various jobs. Not only do our parents, teachers, and surroundings associate boys and girls with gender-typical toys and role-play games since we are children(Padavic and Reskin 2002; Thorne 1993), more importantly, this ingrained sex-role socialization results in a widely held image or idea of a particular occupation as either "male job" or "female job" later in our life. While jobs feature skills and working conditions, such as heavy physical labor, extreme environmental conditions, mathematical skills, and status-superior interaction, are thought to be male appropriate, jobs

require physical dexterity, clerical perception, nurturing skills, or subservient tasks are stereotyped as "female appropriate" (Kaufman 2002; Kaufman 2010; Reskin and Roos 1990).

The cultural socialization approach contributes to both the supply side and the demand side dynamics underlying the persistence of the sex-segregated labor market. From the supply end, certain jobs fit to employees' gender role better than others according to the sex-role socialization perspective. On the other hand, the demand side may also use cultural stereotypes as an inexpensive screening device when hiring for jobs, particularly skilled jobs, known as statistical discrimination (Bielby and Baron 1986; Reskin 1993). Employers' use of sex in job recruitment thus largely based on presumed gender differences in their strength or family responsibility *and* the belief of nature of "gender appropriate" jobs. Together, the sex-role socialization and cultural stereotyping about jobs result in an uneven representation between men and women in the occupations.

Though quite convincing, these approaches often take cultural beliefs about gender role and job stereotype as a *given* or as a mechanism through which sex segregation could be explained. The changing dynamics of cultural beliefs, its sources, effects, and endurance, have been speculated but received little empirical attention. Only a few studies have looked into the structural arrangement as a driven force for the changing social standing, salary, and other aspects of occupations. For example, studies have found that the more women in an occupation, the less prestigious and value the job is. The impact of changing sex composition in occupations on the cultural meanings about men, women, and occupation identities has yet to be examined empirically.

Labor market structure and gender queue

As a reaction against the individualistic research traditions in social stratification, a growing number of theorists have been started highlighting the economic and organizational structures as constraints on occupational integration. They criticize the individualistic approaches for ignoring the function of actual labor market that underlie and constrain individual choices. The "structurelessness" or "free choice" assumption (be they familial, sociocultural) put the sex segregation problem in a vacuum, and as a consequence, any solutions derived from it will be incomplete from the structuralists' point of view.

In making an effort to solve this issue, the dual labor market theorists came up with various indicators to distinguish secondary labor markets, where women predominantly reside, from primary labor market (Tolbert, Horan, and Beck 1980). They then predict that industries with more "secondary-like" indicators, such as less capital-intensive, staffed by more part-time workers, less union members, etc., will be more likely to experience increased proportion of women whereas the primary segments of labor market will be harder to overcome gender segregation.

The emphasis on the structural part of labor market has recently developed into more theoretical explanations that incorporate individuals and groups, as well as structural forces, to explain the change labor market processes and resulting outcomes. Among them, queuing theory (Reskin and Roos 1990) have shown the most evident to support it (Cotter, Hermsen, and Vanneman 2001; Kaufman 2002; Rich 1995). Reskin and Roos (1990) developed the queuing theory that argue all jobs have labor queues in which the ranking of applicants reflects not only the applicant's human capital but also distinctive patterns of sex ordering, derived from cultural stereotype. The labor market is thus constituted of and affected by the job queues (based on employees' preferences) *and* labor force queues (based on employers' preferences out of

economic consideration and their presumed differences in strength or tolerance of adverse working conditions about men and women). Both queues have its ordering and when they interact, the relative standing of women in the labor force queue and in the job queue regarding women's preferences will decide which potential jobs women can take.

The power of queuing theory lies in the fact that it integrates macro and micro forces, as well as supply side and demand side, emphasis. It acknowledges the utility of individual human capital and preferences but also highlights the structural constrains of labor market. Job traits labeled as male "appropriate" or "inappropriate" influence the ordering of the "ideal workers" employers look for. Occupational integration happens only when the most favored groups "run out" because of employment growth, public sentiments, or external pressure for equalizing (for example, affirmative action policy) (for a review, see Kaufman 2010; Reskin 1993:251).

Structural approaches have demonstrated its power in terms of predictions of labor market change in recent years. However, there are things that still need to be addressed in order to analyze the dynamic of labor market change. For example, what are the determinants of various sorts of queue formation? Where does the widespread employer stereotype about sex-typed nature of jobs come from? Can it change over time? Answers to these questions will help us understand the nature of queues better.

Critiques to occupational segregation literature in general

One issue related to the afore-mentioned three perspectives is that, so long as the relationship between such individual, cultural, and structural variables is assumed to be additive, researchers cannot gain a full picture of the complexities of sex segregation. To date, most studies have been focusing on the testing of competing hypotheses derived from demand-side and supply-side approaches. Results from such line of research are mixed. The *interactive* nature

between levels, especially the two macro-level perspectives, has been largely left out. The cyclical relationship between cultural stereotypes and observed patterns of sex segregation is implied in queuing theory but has yet to be investigated.

Like explanations based on fertility and educational changes, it is difficult to sort out cause and effect in observing the association between occupational integration and the cultural changes that have accompanied that trend. However, I argue in this thesis, we need to view these forces to be both interactive and mutually reinforcing. Structural analyses must be supplemented by an understanding of the role that cultural beliefs played in response to structural constraints, and vice versa. By doing this, studies could be able to demonstrate the mutually reinforcing economic and cultural changes *historically* that reduce gender inequalities without losing one sight over the other.

Another issue is that while duties, prerequisites and rewards describe a job, researchers recently rethink occupations are complex abstract constructions consisting of meanings and expectations associated with categorical groupings of jobs (Hauser and Warren 1997a). We need a better understanding of the way gender combines with other identities, say occupational identities, and shapes the way they are played. Symbolic meaning of occupations, in the forms subjective evaluation of occupational roles and identities, should therefore also be considered to attribute to the gender occupational segregation. The cultural approaches measure cultural beliefs towards gender and stereotypes about jobs separately and independently. With little consideration that these two cultural beliefs might work as one unity and thus should be measured in the same way, researchers might neglect the tension caused by dissonance of these two beliefs. In other words, when gender ideology and stereotype about jobs exert their influence

on social structure in different directions, looking only one instead of the other would certainly cause confusion about the role played by culture.

For example, Charles and Grusky (2004) found that rising support for egalitarianism and equal opportunity does not necessarily challenge ideologies of gender essentialism, let alone structural segregation. One can simultaneously believe that men and women should have equal opportunity and that women and men (gender ideology) are nonetheless suited to different sort of work (which is the cultural belief about occupations). An isolated belief system cannot explain the occupational segregation unless we take cultural beliefs towards men, women, and all kinds of jobs into consideration.

In a laboratory experiment and audit study conducted by Correll et al. (2007) find that mothers were penalized on a host of measures, including perceived *competence* and recommended salary. Their data shows that actual employers discriminate against mothers, but not against fathers, based on the presumed mismatch of the competence between *mother* (gender identity) and the *job* (job identity) under examine. The study clearly demonstrated that mother and job identity are associated with a specific cultural meanings (competence, power). These cultural meanings facilitate men's standing in the hierarchy while deteriorate the social standing of their counterparts'.

In summary, both gender theories and various theories of occupation segregation suggest that there is an interactive dynamic between the macro-level cultural beliefs and social structure, yet little empirical work has looked into it. Based on the previous research reviewed above, it is quite logic at this point to expect that, gender distributions within occupations would be influenced by the cultural meanings of both gender and occupations *and* that those gender

distributions within occupation would, in turn have an impact on the cultural meanings about occupations and/or gender identities in the future.

To adequately address the mutually reinforcing effects at the macro-level *and* measure the cultural meanings in a standardized approach capturing subjective meanings, researchers need to: 1) apply panel data over time that could examine the reciprocal relationship between the two driven forces of occupational segregation; 2) adopt a new approach that would allow the measurement of both set of identities in an identical way. I now turn to semantic differential researches that have been demonstrated its usefulness in capturing social structure and cultural beliefs in the past couple of decades. Empirical work done by affect control theorists applying this methodology also showed promising prospects in this area.

Affective Meanings of Gender and Occupational Identity

Social structural perspective (Eagly and Steffen 1984; Eagly and Wendy 1999; Ridgeway and Smith-Lovin 1999) illustrate the relationship between macro-level division of labor and interactional-level behavior differences between sexes. Similar to the traditional approaches measuring occupation status, gender and occupational roles only represent the cognitive aspect and often gender ideology is categorical. Affective meanings of roles or identities men and women evaluated subjectively have not been captured yet. As I argue, cultural beliefs in the form of affective meaning towards gender identity and occupational identity are necessarily to be included in our studies to fully understand the myth of gender segregation.

Semantic differential in affect control theory

How can we *observe* and *measure* cultural beliefs, which are intrinsically subjective and internal? As social scientists, most of the time we rely on so-called "subjective report"

instruments, such as questionnaires, to collect this kind of information, which in turn presume that the subjects can report, i.e., describe, their subjective feelings.

The semantic differential approach, first developed by Osgood and his colleagues (Osgood 1962; Osgood, May, and Miron 1975a; Osgood, Suci, and Tannenbaum 1957) and later applied by Heise and other affect control theorists in various topics (Heise 1979; 2010; Lee 1998; Mackinnon and Langford 1994;), try to solve the problem by focusing on the language people use. They contend that as long as language is concerned, the number of adjectives we have would be the number of ways people could use to describe things around us (Heise 2010).

In order to give order to all the ways people use to describe the world and their affective feelings toward it, Charles Osgood and associates designed a cross-national project to test their hypothesis, that "regardless of language or culture, human beings utilize the same qualifying (descriptive) framework in allocating the affective meanings of concepts" (Osgood, May, and Miron 1975, p.6 quoted from Heise 2010).

They first chose 100 "cultural common" concepts as the substantive stimulus to solicit adjectives (qualifiers). These concepts, both concrete and abstract, could be considered as a "representative sample" of concepts. Next, when a collection of 10,000 qualifiers were elicited from those 100 stimulus from indigenous high schooler[3], researchers reduced the total number of distinct qualifiers to 60 or so representative qualifiers via computerized procedure based on three criteria: *salience* (total frequency of usage across all substantives); *diversity* (number of different substantives with which used), and *independency* (lack of correlation with other qualifiers across substantives). The qualifiers chosen were then given the opposite word for each qualifier to

[3] High school-level male are appropriate in their study because they have full command of their native language and are generally integrated with their native culture but are less likely than college students to have been exposed to other cultures and languages. Also because education is much more variable (selective) than for males across the world, only male high schooler were recruited in the original study to elicit substantives and construct bipolar scales (Osggod, May, and Miron 1975, p. 20).

construct bipolar scales. Participants (different from the high schooler) later were asked to judge the original 100 substantives against these scales in each language/culture community (Osgood, May, and Miron 1975).

With scales from every culture-language venue contributing to define the sematic space, Osgood et al (1975a) found that persons, properties of person, behavior, objects, and settings evoke affective response majorly along three dimensions: (1) *Evaluation*—the approval or disapproval of something, based upon such criteria as *bad*, *awful* versus *good*, *nice*; (2) *Potency*—based upon size, strength or power, as *little*, *powerless* versus *big*, *powerful*; (3) *Activity*—based upon perceptual stimulation (*noisy* versus *quiet*), speed (*fast* versus *slow*) or age (*young* versus *old*).

Each dimension is represented by several bi-polar scales which are basically pairs of adjectives with opposite meanings. For example in English, evaluation is represented by such bi-polar scales as "nice-awful," "good-bad," "sweet-sour," etc.; potency is represented by scales as "powerful-powerless," "big-little," "strong-weak," etc.; and activity is represented by "fast-slow," "alive-dead," "young-old,", etc. (Osgood, May, and Miron 1975b). Using factor analysis to extract the dimensions, Osgood et al. reported that the three dimensions cumulatively explained close to 70% of the variance in the American data.

Based on their analyses of data from all 21 cultures and languages, they concluded that "Human beings, no matter where they live or what language they speak, apparently abstract about the same properties of things for making comparisons, and they order these different modes of qualifying in roughly the same way in importance." (Osgood, May, and Miron 1975b). This means researchers can empirically measure how people feel about the world with relatively simple and stardarized instruments.

Building on Osgood's (Osgood 1962; Osgood, May, and Miron 1975a; Osgood, Suci, and Tannenbaum 1957) work, David Heise (1979) proposed and developed affect control theory dealing with mechanism and associated behaviors and emotions that underlie the formation, maintenance, and transformation of person's definitions of situation in the particular social settings in which they are interacting. The theory suggests that people use cultural meanings to translate larger social structure into interpersonal interaction. The link between macro features of society and cultural sentiments in their theory provides researchers the possibility to embrace the affective meaning into the dialogue of gender occupational segregation.

In affect control theory, a set of *fundamental* sentiments, which are culturally determined affective associations individuals associated with cultural concepts at large, are triggered by persons' identification or recognition of the objects in the situation. Those fundamental sentiments serve as standard meaning when individual form their expectation and behavior in situation.

By carefully examining every entry in the Doubleday Dictionary (Landau 1975), Heise (2010) selected a broad range of general vocabulary to create a lists of identities and interpersonal acts for most of his projects. Each word or phrase was then rated by roughly 30 male and 30 female college students as cultural informants. Though individual variance is usually thought to reflect respondents' personal sentiments, it also largely reflects cultural norms. In a series of tests, Heise found that "the reliability above .90 on three dimensions of affective response can be achieved by averaging ratings of 30 respondents", which is exactly what most affect control dictionary data did (Heise 2010, p.201).

In this study I use the U.S. sentiment dictionaries (see more details in method section), sentiments for gender identity ("man" and "woman") as well as a variety of occupational

identities (e.g., “plumber”, “registered nurse”, or “chemist”) that have affect evoked by them measured by the *Evaluation, Potency,* and *Activity* profile.

Several empirical studies have applied the Evaluation, Potency, and Activity profile to test theories in various areas. For instance, study (Moore and Robinson 2006) focus on the occupational identities using the three dimensions suggested that occupational identity preferences reflect work-specific biographical identities. What the authors argue is that the internalized preferences to work within the structural constrains individuals face predict the occupational identity outcomes. In their interesting study of which kids can 'become' scientists, Lee (1998) found that on average, girls' self-concepts are more like their perceptions of same-sex others than those of boys, and more unlike their perceptions of other science students. The *discrepancies* between self-concepts (as either girl or boy) and perceptions of those in science-related disciplines are associated with lower interest in those disciplines and that explain some differences, by sex, in interest. Their work sheds light on the connections between gender and occupational identity with regards to identity maintenance, as well as gender segregation in natural science filed at least.

The validity of Evaluation, Potency, and Activity profile

To verify whether the *Evaluation, Potency,* and *Activity* profile can capture the fundamental meanings that really matter in social life, Kemper and Collins (Kemper and Collins 1990) discussed and compared all the dimensionality scholars proposed in the past. Their study demonstrates that two relational dimensions of microinteraction are central to understand the social structures: power and status. Interestingly, Collins (1981) also acknowledged that *Evaluation, Potency,* and *Activity* dimension do generally correspond to interactional power and status that build upwards to macro-conditions.

Following the tradition of structural symbolic interaction, researchers found the affective meaning associate with occupational identity is a partial, yet independent, determinant of occupational *prestige* (Mackinnon and Langford 1994). Scales based on the social sentiments relating to occupational identities are more closely attuned to how individuals subjectively view occupational titles than existing prestige and socioeconomical index scales. Their finding implies that the three dimension of *Evaluation*, *Potency*, and *Activity* structure may correspond to the social-structural dimension of status, power and expressiveness (Kemper and Collins 1990). Therefore, applying the subjective meaning toward gender and occupational identity on EPA dimension might shed light on the gender segregation we used to ignore.

Summary and predictions

In her presidential address in the Annual Meeting of the American Sociological Association in 2006, Epstein (2007) strongly advocated the sociologists at all areas to study social boundary based on sex because it creates the most fundamental social divide. Theories as close as social role, multilevel gender system, and occupational segregation are, among others, the most prominent areas to dismantle the myriad of gender inequality. When investigating gender segregation, they often intersected with each other and adopted multiple perspectives.

However, as discussed above, several issues have not been fully addressed in these areas. The relationship between social structure and cultural beliefs regarding gender identity and occupational identities is still less clear at the macro-level. Standardized and coherent measurement of cultural beliefs about both gender *and* occupations has few empirical applications (Lee 1998). In addition, researchers have yet to know the power of subjective evaluating aspect of occupations on gender stratification beyond its cognitive part.

I then suggested another approach to look at this issue that combines cultural meanings of gender and occupational identity with gender arrangement in the labor market. Doing so offers a number of advantages. First as I argue below, it illustrates the processes outlined by the aforementioned theories that are more compatible than they may appear initially. Second, combining these theoretical perspectives allow me to empirically test the mutually reinforcing effects between cultural meanings of gender and occupational identity and gender segregation in employment, by showing the extent to which gender identity and occupational identity reflect and promote sex segregation in employment. Figure 2 illustrated the conceptual model I aim to test in the study.

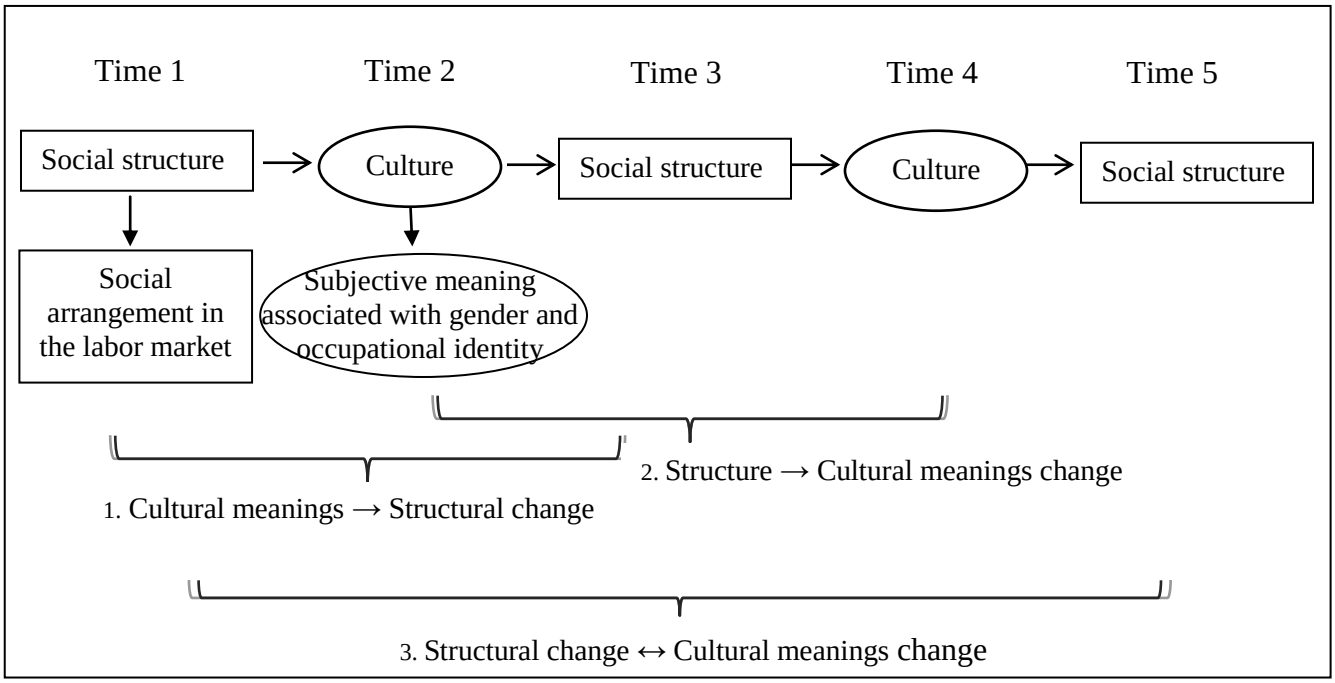


Figure 2: Hypothesized reciprocal relationship between social structure and cultural beliefs

I use the dimensions of *Evaluation*, *Potency*, and *Activity* to operationalize all identity meanings in this study and use the social arrangement in the labor market to represent social structure. Accordingly, I predict that culture's subjective meanings about gender identity and occupational identities will be predicted by the social arrangement in the labor market, namely,

the women's (or men's) composition in each occupation. The women identity meaning is likely to develop toward meanings of occupations employing higher proportion of female workers[4]. Similarly, under the assumption that cultural beliefs will instruct human behavior and therefore construct or shape social institutions, I hypothesize that the larger the dissonance between gender meaning and cultural meanings towards occupational identity, the lower the proportion of female workers could be found, independently from other factors such as educational level, income, and spots available in that occupations.

In addition, the discrepancy between any *Evaluation*, *Potency*, and *Evaluation* dimensions for two identities (gender and occupation) could be meaningful with respect to formation of social structure given their respective emphasis on cultural sentiments. I therefore also examine the three dimensions separately.

There are three components in figure 2. The first component allows me to test whether cultural meanings would predict the structural change over time. The second component including cultural meaning at two time points and social structure in the middle provides the opportunity to test whether and how the structural arrangement influences the changing meaning of culture. Finally and ideally with all the variables at different time points, researchers can examine the mutually reinforcing nature between cultural and social structure empirically. Given the complexity of the conceptual model proposed, this paper will only investigate the first components as a first step of a big project. The findings from the first part will shed lights on the other parts I aim to examine later on.

[4] I do not distinguish whether gender identity meaning develop towards occupational identities or occupational identities develop towards gender identity. Theoretically it would operate in both directions. This study is more interested in the discrepancy between the two identities and thus how does the sentiment distance reflect and predict social arrangement in labor market.

CHAPTER 3

DATA AND METHOD

Data sources

This study extracted data from multiple sources and compiled them into one dataset. First archival datasets from affect control theory websites are used to measure affective meaning of gender identities and occupational identities. The affect control theory dataset is stored in a software program called Java INTERACT:

http://www.indiana.edu/~socpsy/ACT/interact/JavaInteract.html.

Two datasets in INTERACT are employed in this study to address the causal relationship I interested. The first dataset is U.S.A North Carolina, 1978 data obtained with paper questionnaires from 1,225 North Carolina undergraduates on their ratings of 721 Identities, 600 Behaviors, 440 Modifiers, and 345 Settings. The second dataset is U.S.A. Indiana, 2003 data collected at Indiana University, via the Internet using the Surveyor applet by 1027 respondents on their ratings of 500 Identities, 500 Behaviors, 300 Modifiers, and 200 Settings. Only identity ratings were used in this paper. The affective meaning of these identities is measured on a continuous scale in terms of evaluation, potency, and activity scores from -4 to 4.

A total of 112 and 43 identities are qualified as occupational identities in 1978 and 2003 dataset respectively. Among them, 32 occupational identities are identical in both datasets. Given that the list of occupations typically differ in the two datasets and I only have a very small sample size in 2003 dataset, I did not include the latest data in the multivariate models for the sake of statistical power. As I addressed later in the thesis again, the lack of sufficient affective

meanings at a second time point limited the numbers of hypotheses deriving from my theoretical arguments that I can test at this point. I was only able to empirically test the first partial relationship between culture and structure in this thesis. With the new wave of 2012 affect control data collected underway, I believe, a more rigorous test of the proposed relationship will be completed.

Descriptive data analysis for identity sentiments in 2003 is presented for references thought I did not use them in the multivariate models. This allows scholars to compare specific occupations as representative examples of certain types of occupations as well as examine how the changes of meaning and distributional for different groups of occupations varies over time (Hara 2000; Lin and Xie 1988; Treiman 1977) (see Appendix A for occupation list in 1978 and 2003).

To acquire information about sex composition of occupations, I used the Decennial Census Data (Census 1970; Census 1980; Census 2000; Priebe and Kirk 1990) and Current Population Survey (CPS). The CPS is large, monthly, national representative survey of approximately 60,000 households conducted by the U.S. Census Bureau to measure the attributes of the labor force. Data are collected by personal and telephone interviews from a sampling pool covering non-institutionalized civilian adults ages 16 to 64. Self-employed are excluded in their data. The entire data file was organized by occupations and census year, thereby providing five cross-sectional datasets for the 1970-2010 periods to account for the lag effects of sentimental reporting (in 1978 and 2003).

Because both census and CPS only report certain variables at an ordinal (categorical) level and have some issues on weighting, to control variables which previous studies have found

contributed to the sex segregation, I exported data from the Integrated Public Use Microdata Series (IPUMS-USA) as my third part of the compiled dataset.

The IPUMS-USA consists of more than fifty high-precision samples of the American population drawn from fifteen federal censuses and from the American Community Surveys (ACS) of 2000-2010. Some of these samples have existed for years, and others were created specifically for this database. It is essentially a random sample of 1% or 5% of the census with weight either by person or by household. To keep consistency across multiple time points, I decided to use 1% sample for all years given that IPUMS does not have 5% sample for 1970. Also since IPUMS is not a collection of compiled statistics but a composed of micro-data, each record is a person, with all characteristics numerically coded. The advantage for using this data is that researchers can analyze the millions of records in the database with the help of their data extraction system. This system enables users to select only the samples and variables they require. Moreover, the IPUMS assigns uniform codes across all the samples and brings relevant documentation into a coherent form, it greatly facilitate my analysis of social and economic change across occupations.

Measurement

Dependent variable

The proportion of female workers in each occupation over time. Scholarly work on sex segregative dynamics usually uses proportion of female worker in each occupation as a way to measure sex segregation/integration. One advantage of using proportion instead of raw numbers of female occupants in occupation is that it controls the size of occupations. As a result of applying panel data over multiple time points, as is in my case, studying the change proportion of women, be it increasing, decreasing, or stable, , in sex composition in an occupation over time

provides a window of opportunity to examine the dynamics of labor sex-typing (Oppenheimer 1973). Another advantage for studies of concrete, identifiable changes in the labor market is that it provides the evidence for testing the validity of theories meant to clarify the sources and dynamics of those changes.

The census data provides employed persons by detailed occupation and sex which informs us the percentage of women in every occupation. I measured the proportion of women in each occupation as the percentage of female workers in occupations at five time points: 1970, 1980, 1990, 2000 and 2010 respectively.

Independent variables

Cultural meanings of the gender identity and occupational identities on the Evaluation, Potency, and Activity dimensions in 1978 and 2003. To measure the cultural meanings of gender identity I use the evaluation, potency, and activity profile of the concepts Man and Woman. To measure the cultural meanings associated with occupations, I use the evaluation, potency, and activity profiles of the 112 occupations available in the 1978 U.S. cultural dictionary and the 43 occupations available in the 2003 U.S. cultural dictionary. Affect control theory recognizes that affective meanings toward various objects can be varied by the sex of observer. For a male observer, the cultural meanings of man, woman, and firefighter might be different from that of a female observer. To account for the gender differences, I used the cultural meanings from both sexes' perspective.

Based on the affective meaning of gender identity and occupational identities, I calculated the *distance between gender and occupational identity meaning* as the squared difference between gender and occupational identity on Evaluation, Potency, and Activity dimension respectively, for example, $(\text{manager}_e\text{-woman}_e)^2$, $(\text{manager}_p\text{-woman}_p)^2$, $(\text{manager}_a\text{-woman}_a)^2$.

Separating three dimensions enables the investigation of unique contribution each dimension makes to the gender segregation in employment. Since the distances were somewhat skewed (skewness range from 1.51 to 3.32 and Kurtosis range from 4.15 to 9.7), I employed logarithmic transformation to get a normal distribution of values. I refer to these logged squared differences below as *sentiment distance*.

Affective meanings towards occupational identities on Evaluation, Potency, and Activity dimension. The sentimental meanings towards various occupations can be viewed as proxies for job characteristics, such as status, power, and expressiveness. Therefore I included them into my models as control for occupational characteristics.

Control variables

Education level in each occupation: The analysis of controlled human capital presented here is not carried out at the level of the individual. Instead, the average education level of incumbents in each occupation is used as a proxy for demand for human capital. While the examination of both male and female incumbents' education level would be optimal, this was impossible given that the dependent variable was the proportion female change.

In measuring the education at the occupation level, I calculated average education for each occupation using aggregated data from IMPUS-USA from 1970 to 2010. Education level was coded as N/A or no schooling=0; nursery school to grade 4=1; grade 5-8=2; grade 9=3; grade10=4; grade 11=5; grade12=6; 1 year of college=7; two years of college=8; 4 years of college=10; and 5+ years of college=11. I anticipated a positive relationship between growth in female employment in each occupations and education level over multiple time periods based on human capital theory argument.

Percentage of union membership in each occupation: data on union membership for detailed occupations are available only since 1983. Thus I used the calculated union membership from a research note describing construction and provision of private and public union membership database (Hirsch and Macpherson 2003). Their database was also compiled from the Current Population Survey (CPS). Based on previous findings that indicate high union membership negatively affects women's entering into certain occupations, I expect the higher union membership would predict the decrease of women' composition in occupations.

Hauser-Warren Socioeconomic Index (HWsei): I also controlled the job characteristics by including Hauser-Warren socioeconomic index in the models (Hauser and Warren 1997b). This new set of indexes for the 1990 Census occupation are based on the relationship between the prestige ratings obtained by Nakao and Treas (1994) in the 1989 General Social Survey and characteristics of occupational incumbents in the 1990 Census[5].

Summary of hypotheses:

Figure 3 shows the hypothesized relationship between cultural beliefs and structural arrangement of labor market over multiple time periods. The first part of this graph (from structure in 1970 to cultural beliefs in 1978 to structural arrangement later on) would allow me to test the effects of cultural meanings on structural change. The second part of this diagram, following the same logic, would allow me to test the impact of structural arrangement on the changing meanings of cultural beliefs. The third segment of this figure that looked into both the

[5] I did not include prestige score in my models as control variable mainly for two reasons: first, analysis exhibits the signs of high multi-collinearity between prestige score and socioeconomic index (VIF=7.152 for socioeconomic index and 8.3 for prestige score). I rerun the models separately only include one variable at a time and the R-square is higher when include socioeconomic index than prestige score. Second, theoretically, the prestige score shares some variance with EPA profile as demonstrated in previous study (Mackinnon and Langford 1994). Putting prestige score in my models would conflate certain variances from independent variables that this paper is more interested in. So from both statistical and theoretical perspective, I decide to use socioeconomic indexes rather than prestige score as control variable.

change of cultural beliefs and structure would finally enable researchers to study and compare the power of relationship between forces at the macro-level.

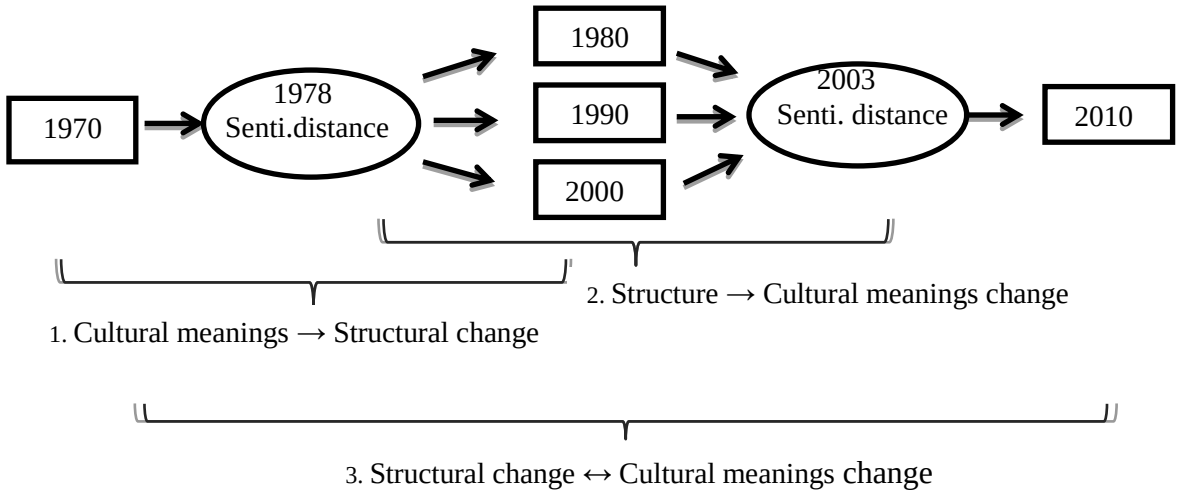


Figure 3: Hypothesized relationship between structure and cultural beliefs over multiple time periods.

As stated before, this paper will only investigate the first component as a first step. Also at this point the second and third part could not be tested given the small sample size of cultural meanings in 2003. With more data collection underway, I will later test the rest of my hypotheses in the follow-up study.

The sex-role and socialization perspective concentrates on the cultural differences among sex groups that create job queues for different types of positions and lead to sex segregation. I manifest gender at a macro-level as cultural beliefs that could influence structural change by their *distance* from occupational identities. Based on theories that demostrated the influence of cultural beliefs on strucute, I hypothesized:

Hypothesis 1(a)(b)(c)(d): The larger the sentiment distance between the *Evaluation* profile of an occupational identity and the women in 1978, the fewer the proportion of women in each occupation in *(a)* 1980 *(b)* 1990 *(c)* 2000 *(d)* 2010, after controlling the percentage of female workers in 1970;

Hypothesis 2(a)(b)(c)(d): The larger the sentiment distance between the *Potency* profile of an occupational identity and the women in 1978, the fewer the proportion of women in each occupation in *(a)* 1980 *(b)* 1990 *(c)* 2000 *(d)* 2010, after controlling the percentage of female workers in 1970;

Hypothesis 3(a)(b)(c)(d): The larger the sentiment distance between the *Activity* profile of an occupational identity and the women in 1978, the fewer the proportion of women in each occupation in *(a)* 1980 *(b)* 1990 *(c)* 2000 *(d)* 2010, after controlling the percentage of female workers in 1970;

Given the cultural lag effect proposed by researchers, I predict that the effects of cultural beliefs of gender and occupational identity on structural change should become stronger in longer time periods.

Hypothesis 4: The effects of affective meaning distance on the change proportion of women in each occupation will become bigger over longer time periods.

Analytic Strategy

To model the changes of women (men)'s proportion in each occupations over multiple time periods, I estimate multivariate models predicting my outcome variables, using panel data. There is little consensus on the appropriate statistical methods needed to study transitions in panel data, as I doing in this paper. The best way to model changes over time and capture the measurement errors is through Structural Equation Modeling (SEM). However data did not converge in SEM possibly due to sample size and data variation. Then the second best analytic strategy is to apply regression analysis to examine the effects of events on outcomes in two-wave data.

Two basic approaches to study the effects of transitions in two-wave panel data are the lagged dependent variable (LDV) (Johnson 2005), also called regressor variable method (Allison

1990), and change score (CS) methods. The first is the lagged dependent variable model where b_0 is a constant, b_j the regression coefficients, e_i the error term, and i=1, … n individuals (occupations in my case). S_i represents time-invariant exogenous variables. V_i represents time-variant exogenous variables.

$$Y_{i2}= b_0 + b_1X_i + b_3S_i + V_{i2} \text{ (or } V_{i2} + V_{i1}) + e_i,\ \ i=1, \ldots . , n, \quad (1)$$

The second approach is the change score model where the terms for S_i and the constant b_o drop out.

$$(Y_{i2}=b_0 + b_1X_{i1} + b_3S_i + V_{i2} + e_{i2}) - (Y_{i1}=b_0 + b_2X_{i2} + b_3S_i + V_{i1}+ e_{i1})$$

$$(Y_{i2} - Y_{i1}) = (b_0-b_0) + (b_1X_{i1}-b_2X_{i2}) + (b_3S_i-b_3S_i) + (V_{i2} - V_{i1}) + (e_{i2}-e_{i1})$$

Which reduces to

$$(Y_{i2} - Y_{i1}) = (b_1X_{i1}-b_2X_{i2}) + (V_{i2} - V_{i1}) + e'_i \qquad (2)$$

Both equations in the two-wave case can be estimated by standard OLS regression, and both approaches can be used to control for the initial level of Y and exogenous variables.

Johnson (2005) discussed the differences between the two approaches at length. In summary, he argued that even though change score has been criticized for the purported unreliability and lack of sensitivity to regression toward mean (Kessler 1977), it (1) controls all time-invariant effects that LDV model did not enjoy; (2) avoids the violation problem of the unbiased estimation assumption of OLS method by not including Y_1 on the right-hand side of equation; (3) does not necessarily imply a biased estimation of the transition effects by potential misspecification.

Despite the above mentioned advantages, there are several reasons that this model is not suitable for my data. First, in the CS model, all the independent variables need to be change scores, unless it is in an experimental design that stimuli is only manipulated during pre- and

post-test. Clearly this is not my case in this study. Cultural meanings rarely exist and exert its influence at single time point. Besides, lacking the second time point meanings also prevent me from adopting CS model. Second, theoretically, the lagged dependent variable model is more appropriate test my hypothesis that after control the influence of previous social structure, cultural meanings still exert its impact on the social arraignment in the labor market. Based on the two reasons, I thus use the LDV approach in this paper to examine the effects of affective meanings in multiple two-wave panel data.

CHAPTER 4

ANALYSIS AND RESULTS

Descriptive statistics

Table 1 presents descriptive statistics on variables used in the analysis. My primary dependent variable, proportion of women in each occupation, is increasing over time, from 33% on average in 1970 to 43.5% in 2010. In general, women account for more than half of all workers within several industrial sectors: financial activities, education and health service, leisure and hospitality. However, women are substantially underrepresented in agriculture, mining, construction, manufacturing, and transportation and utilities. A small number of occupations have close to zero women, for instance, longshore worker and funeral director.

With regard to the segregative processes in paid employment, there are several occupations have been experiencing feminization process, i.e. women's proportional gains in any paid employment category (Rich 1995) (data not shown). For example, from 1970 to 2010, thirty-one occupations (30% of the total occupations) have more than 20 percentage growth for female workers (e.g., instructor, 20.8% increase in proportion of women; detective, 22.9%; physician, 23.1%; judge, 25.3%; psychologist, 30.4%; insurance agent, 33.9%; accountant, 35.8%; and lawyer 44.8%). At the same time, jobs with female-predominant stability (e.g., library assistant changed from 78.9% in 1970 to 81.9% in 2010; cashier from 83.7% to 76%) and male-predominant stability (e.g., plumber from 1.1% to 1.7% of female workers) account for 43% of the total occupations[6]. Occupations such as flight attendant and cook have experienced

[6] I use 20% growth of female workers as a cutoff point to define feminization process. Change proportion of women within ±10% is defined as either female-predominant stability or male-predominant stability. Occupations which experience more than 20%

masculinization comparing to other jobs, thought the number of jobs which experienced masculinization process is very small in my data.

The average educational level for all occupations in 1970 is 6.58, which is a little above high school level. By the time of 2010, the average education level increases to nearly 2 years of college. Contrary to the increasing education level, the union membership has been decreasing since 1980s, from 20% to 14.8% in 2010. This trend corresponds to most of the existing literature that show unionization has been dramatically declined since 1970s although public-sector workers had a union membership rate (37%) more than five times higher than of private-sector workers (6.9%). The Hauser and Warren socioeconomic index ranges from 9.56 to 80.56 (skewness=.56 and Kurtosis=2.51). This distribution also demonstrates that occupational identities in the compiled dataset cover a whole spectrum of occupation ranking.

My key independent variables are the affective meaning towards occupational identities and the logged squared distance between gender identity and occupational identities (sentiment distance). Compared to men, women rated occupational identities more positive on evaluation dimension (.892 vs. .683, t=-6.36, p<.000), more powerful (.655 vs. .481, t=-5.77, p<.000) and relative the same on activity (.125 vs. 117, t=-0.21, p=.58).

As for affective meaning towards gender identity ("man" and "woman"), Appendix B lists the EPA profile of men and women by the sex of observer both in 1978 and 2003. Comparing the sentiment distance between gender and occupational identities sentiments in EPA space for men and those of distance for women, men experience a bigger dissonance between their gender identity and occupational identities on both evaluation and activity dimension whereas women have a large dissonance between women identity and occupational identities on potency dimension.

---

decrease of proportion of female workers are defined as masculinization in my data.

With all the descriptive analysis in hand, I now turn to the multivariate models to test my major hypotheses in this thesis.

Table 1: Descriptive Statistics for Variables Used in the Analysis

		Mean	SD	Minimum	Maximum	N
Dependent variable						
Percent of women in each occupation	_1970	.330	.338	.011	.981	110
	_1980	.375	.326	.010	.988	113
	_1990	.404	.309	.015	.987	114
	_2000	.418	.297	.013	.977	119
	_2010	.435	.297	.013	.976	115
Control variables						
Education level	_1970	6.58	2.25	3.18	10.8	113
	_1980	7.16	1.97	4.21	10.8	118
	_1990	7.42	1.80	4.44	10.9	118
	_2000	7.57	1.83	4.38	11.0	116
	_2010	7.84	1.76	4.77	11.0	112
Percent of Union membership						
	_1983	.202	.194	.005	.958	124
	_1990	.181	.183	.006	.827	124
	_2000	.164	.186	.011	.803	123
	_2010	.148	.173	.007	.828	123
Socioeconomic Index		41.1	17.9	9.56	80.5	124
Independent variables						
Occ. identity in 1978 (male observer[a])	_evaluation	.683	.524	-1.02	1.90	112
	_potency	.481	.870	-1.42	2.35	112
	_activity	.117	.726	-1.72	2.13	112

Table 1 *(continued)*

		Mean	SD	Minimum	Maximum	N
Independent variable						
Occ. identity in 1978						
(women observer[b])	_evaluation	.892	.486	-.240	2.53	112
	_potency	.655	.790	-1.03	2.81	112
	_activity	.125	.684	-1.70	2.06	112
Sentiment distance in 1978						
(man[c])	_evaluation	-1.91	1.82	-7.82	1.48	112
	_potency	-1.02	2.13	-7.82	1.82	112
	_activity	-1.42	1.87	-7.82	1.65	112
Sentiment distance in 1978						
(woman[d])	_evaluation	-.660	1.57	-9.21	1.36	112
	_potency	-1.41	1.79	-9.21	1.51	112
	_activity	-.889	1.79	-9.21	1.87	112

Note: a: All ratings came from male observers. It represents men's cultural beliefs about occupation identities.
b: All ratings came from female observers. It represents women's cultural beliefs about occupation identities.
c: The sentiment distance of cultural meanings between man and occupations.
d: The sentiment distance of cultural meanings between woman and occupations.

Multivariate Regression Results

I first chose the proportion of women within occupations in 1990 as my dependent variable. This time point was chosen because it best illustrates the effects of cultural meanings on the changed proportion of women among occupations. Therefore I use this panel data to run the models step by step, demonstrating the contribution of each set of independent variables separately. Table 2 provides the estimated effects of cultural sentiment on the change proportion of women in each occupation from 1970 to 1990. As formulated in lagged dependent variable model, the percentage of women within occupations in 1970 is included in all models as a pretest. Not surprisingly, this variable significantly predicts the proportion of women in occupations in 1990 and explains nearly 90 % of the variance cross four models.

Table 2: OLS regression of the effects of cultural sentiments in 1978 on the proportion of women within occupations in 1990

	Model 1	Model 2	Model 3	Model 4
Intercept	**.148*** **	**.080** **	.093	-.067
	(.025)	**(.028)**	(.068)	(.127)
% of women in 1970	**.871*** **	**.862*** **	**.889*** **	**.834*** **
	(.367)	**(.034)**	**(.036)**	**(.407)**
Occ.id (Evaluation)	-.027		-.009	.022
	(.024)		(.047)	(.048)
Occ.id (Potency)	.002		.015	-.020
	(.017)		(.017)	(.022)
Occ.id (Activity)	**-.033***		-.038	-.025
	(.016)		(.024)	(.024)
Distance (Evaluation)		.021	.016	.027
		(.015)	(.028)	(.028)
Distance (Potency)		-.002	-.000	.006
		(.017)	(.016)	(.016)
Distance (Activity)		.014	.005	.004
		(.011)	(.015)	(.015)
Controls				
Δ Education				.037
				(.003)
Δ Union membership				-.002
				(.002)
SEI				-.002
				(.002)
N	99	98	96	93
R square	.89	.87	.89	.91
Adjusted R-square	.88	.86	.89	.90

Note: standard error in parentheses.
$^{+}$ p<.1 *p<.05 **p<.001 ***p<.001
Model 1=main effects; Model 2=distance of affective meanings; Model 3=Model 1+Model 2; Model 4=Model 3+control variables.

Model 1 includes only main effect of occupational identities meanings as a control for job characteristics. Over two decades, occupations that are less good, more powerful, and less lively in 1978 experienced the most growth in women's participation. One unit of change on the expressiveness of occupational identity predicts 3.3% decrease in proportion of female workers from 1970 to 1990.

To test my hypothesis that the closer the meaning between gender identity and occupational identity, the larger the growth of women in those occupations, model 2 includes the sentiment distance as independent variables. None of the distance between women's identity and occupational identities is significant and the coefficients are all very small. Given the non-significance of these coefficients, their directions will thus not be given consideration.

Model 3 retains the occupational meanings and adds back in the distance variables. Once again, the distance variables are not statistically significant, whereas the occupational meaning variables remain substantially the same (but the identity distance on activity dimension is now non-significant). To further test the robustness of the effect of the cultural meanings, model 4 includes both sentiment measurements and control variables to account for the change pattern of women's composition in occupations over time. Compared to model 3, which only has sentiment measurement, the adjusted R-square for model 4 only increase one percent. Also some independent variables became unstable and the direction for coefficients have changed after including education level, union membership rate, and socioeconomic index in the model. Given that none of the control variables are significant in any of the models and they might add more complexity to the model and decreasing sample size, I decided not to include those three variables in the later analysis.

Having decided the variables to include in the final models, I now turn my attention to the question of whether or not the relationship between cultural belief (sentiment) and structural arrangement become stronger across different time periods. That is, I examined whether the direction of the coefficients is consistent cross multiple time span *AND* the size effects are increasing over longer period of time. The results of the multivariate regression analyses of change proportion of women in occupations are presented in Table 3.

Table 3: OLS regression of the effects of cultural sentiments on the proportion of women within occupations, multiple time periods (women's perspective)

	1980	1990	2000	2010
Intercept	.045	.093	.136	.145
	(.064)[a]	(.068)	(.094)	(.092)
% of women in 1970	**.927*** **	**.889*** **	**.801*** **	**.823*** **
	(.033)	**(.036)**	**(.049)**	**(.049)**
Occ.id[b] (Evaluation)	-.021	-.038	-.036	-.057
	(.022)	(.024)	(.032)	(.033)
Occ.id (Potency)	-.004	.015	.025	**-.057**[+]
	(.015)	(.017)	(.022)	(.020)
Occ.id (Activity)	.002	-.009	-.005	-.013
	(.044)	(.047)	(.065)	(.064)
Distance[c] (Evaluation)	.018	.016	.004	.003
	(.026)	(.027)	(.038)	(.037)
Distance (Potency)	-.005	-.006	.006	.003
	(.014)	(.015)	(.020)	(.020)
Distance (Activity)	.010	.005	.002	.012
	(.014)	(.015)	.(020)	(.021)
N	95	96	98	92
R square	.926	.903	.795	.818

Note: [a] Standard error in parentheses.
[#] p<.1 *p<.05 **p<.005 ***p<.001
[b] Affective meanings of Occupational identities from women's perspective.
[c] Distance is the logarithmic distance between women's identity and occupational identities both from women's perspective.

Table 3 allows examination of the effects of affective meanings and their distance on the proportion of women in each occupation over one through four decades span. Across the four models, none of the distance variables are significant. The results do not reflect the influence of cultural beliefs about gender and occupational identity on social structure as I hypothesized 1 through 3. Also all but one coefficient for the job characteristics are non-significant.

On the other hand, even though the coefficients become bigger and more significant over longer period of time, (for example, women moved largely to occupations they rated as less good and less active.) most of them are not significant. Therefore the interpretation of those coefficients is questionable. Collectively, I did not find support for my hypotheses that occupational identity with less dissonance with their gender (women) identity will experience large growth in women proportion.

To further test if the same story holds up from men's perspective, I next examined all the models with the same dependent variables but somewhat different independent variables. Main effects of cultural meanings about jobs now come from male observers and sentiment distance presents the logged squared difference between men and occupational identities meanings in their eyes.

Again, the percentage of female workers within occupations in 1970 largely explained the variance across four models and significantly predicts the proportion of women in later time points with diminishing effects. Four models in table 4 show a very similar pattern with table 3 with somewhat more significant coefficients. None of the cultural distance terms are significant. As for the variables representing job characteristics, the greater the expressiveness (active) of the jobs, the less likely women will experience growth among those occupations. The coefficients become larger over longer period of time. In general, both male and female observers seems to

hold the same cultural beliefs that women are moving largely to occupations with less goodness, more power, and less activity (though those coefficients are not all significant and should be interpreted with cautions).

Table 4: OLS regression of the effects of cultural sentiments on the proportion of women within occupations, multiple time periods (men's perspective)

	1980	1990	2000	2010
Intercept	**.071***	**.102****	**.105***	**.123****
	(.034)	**(.036)**	**(.030)**	**(.047)**
% of women in 1970	**.925*****	**.879*****	**.787*****	**.796*****
	(.32)	**(.034)**	**(.047)**	**(.046)**
Occ.id[b] (Evaluation)	-.004	-.005	.028	.024
	(.029)	(.031)	(.043)	(.041)
Occ.id (Potency)	-.012	.009	.015	.015
	(.020)	(.021)	(.031)	(.029)
Occ.id (Activity)	**-.029**[+]	**-.043****	-.039	**-.076****
	(.015)	**(.017)**	(.025)	**(.024)**
Distance[c] (Evaluation)	.010	.020	.041	.041
	(.020)	(.022)	(.031)	(.030)
Distance (Potency)	.000	.004	.005	.002
	(.013)	(.014)	(.018)	(.017)
Distance (Activity)	.006	.005	.008	.021
	(.012)	(.013)	(.019)	(.018)
N	94	95	97	91
R square	.930	.910	.800	.837

Note: [a] Standard error in parentheses.

[+] p<.1 *p<.05 **p<.005 ***p<.001

[b] Affective meanings of Occupational identities from men's perspective.

[c] Distance is the logarithmic distance between men's identity and occupational identities both from men's perspective.

Supplementary analysis

The multivariate analysis did not find evidence for my major hypotheses that cultural beliefs about gender and occupational identities would influence the social structural change over time. The dissonance between those identities meanings does not seem to impact the social arraignment in the labor market. On the contrary, these patterns lend somewhat support to the queuing theory which argues that growth of high-skilled jobs (defined as less "goodness", more power, and less expressiveness) will experience less sex discrimination, i.e. feminization of occupations.

To further understand the cultural beliefs about those identities, I did some supplementary analysis to show the distribution of cultural meanings for "man", "woman", and occupational identity along the evaluation, potency, and activity space over time. In affect control dictionary there are 112 occupations in 1978 and 43 occupational identities in 2003. Among them, 32 identities are identical. So I plot the changing patter for the cultural beliefs based on the 32 occupational identities and gender identity at both year. This visual presentation of the additional information will help readers to better understand the general meaning of sentimental distance and more importantly, make sense of some of the coefficients in our multivariate models.

I first developed a series of *weighted mean occupational identity meanings* for male jobs and female jobs on EPA dimensions respectively. The formula to calculate the weighted mean evaluation for female job in a given $_y$ year is:

Weighted mean evaluation for female $job_y = \sum E_{iy}W_{iy} / (\sum W_{iy})$

Where

E_{iy}=the evaluation for a given occupation *i* in a given year *y*.

W_{iy}=the number of women incumbents for a given occupation *i* in a given year *y*.

So for example, supposedly there are only three occupations in total, secretaries, accountant, and surgeon with 20, 10, and 2 female workers within each occupation. The evaluation for the three occupations is .78, .73, and 1.72 in 1978 respectively. Then the weighted mean evaluation for female job in 1978, according to the formula, is ([.78*20+.73*10+1.72+2)/(20+10+2]) .823.

I used the weighted mean occupational identities sentiments so that the more female incumbents in an occupation, the more weight its EPA sentiment counts toward the mean "women's jobs". Similarly, the more male occupants in an occupation, the more weight its EPA profile counts toward the mean labeled "men's jobs". So, the "women's jobs" variable tells us the average sentiments associated with all of the jobs occupied by women, weighted by the number of women in each job and the "men's jobs" variable tells us the average sentiments associated with the jobs held by men, weighted by the number of men in each job. In each panel this information is presented separately for cultural meanings reported by men and those reported by women.

Besides, if the evaluation comes from a *female observer*, then the average mean evaluation represents what the cultural beliefs about female's job in women's eyes. It would be men's cultural beliefs about female's job if the evaluations come from male observer. Similarly, I also generated weighted mean *Evaluation*, *Potency* and *Activity* for male jobs in both men's eyes *and* in women's eyes.

Figure 3 plots each of these measurements of cultural beliefs for gender ("man" and "woman") and occupational identities ("men's job" and "women's job") at two time points (1978 and 2003). This descriptive figure presents readers an intuitive visual image about the meanings of gender, occupation from both sexes' perspective.

Figure 3 panel (A) shows that on evaluation dimension, women have a slightly more positive semantic rating towards all identities compare to their male counterparts in general, except for their own gender identity in 1978 (1.73 vs. 2.34). Both sexes perceive the sentiment change for man, men's job, and women's job in a similar way. However, they vary dramatically on the change trend for woman identity. Men rated woman less positive on evaluation in 2003 whereas women perceive the woman identity to become even better.

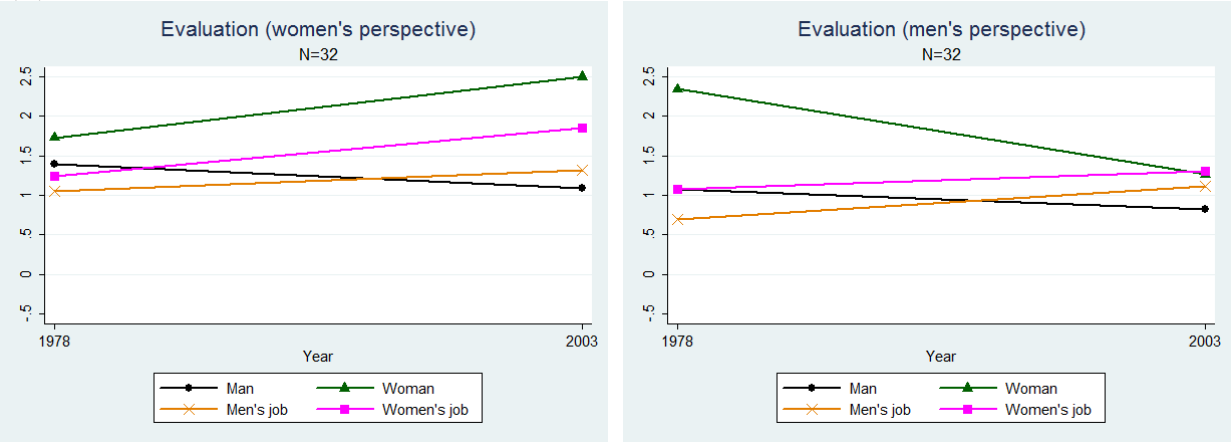
Panel (B) exhibits a similar pattern on potency dimension. Men and women do not differ much on their beliefs for man, men's, and women's job. Both share the same belief that men's job and women's job are converging in terms of their potency. However, they vary dramatically on the change trend for the woman identity. Despite of men's beliefs about women's job as rising on potency over time, they still hold the sentiment that woman are becoming less powerful. On the other hand, women perceive themselves much more powerful than they were in 1978.

Finally panel (C) on the activity dimension, the results are very similar to those of on the other two dimensions. Again, men and women vary dramatically on their beliefs about woman (as a gender identity) despite their shared beliefs about man, men's, and women's job.

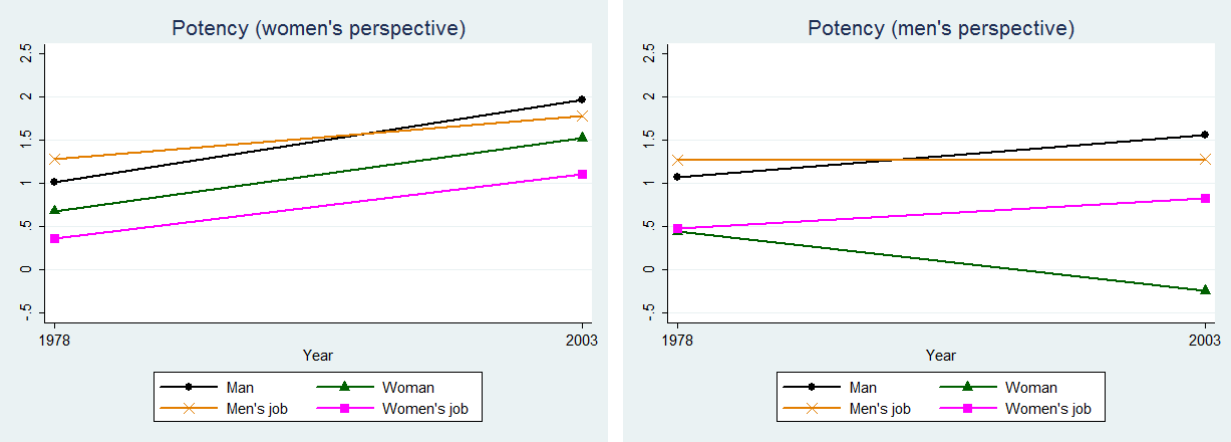
The discriptive data did not show us the reciporcal relationship between culture and social structure. Nevertheless, it did displayed some interesting distributions of meaning about man, woman, and their respective jobs. Frist, overall men and women seem to share the same cultural beliefs about most of the identities meanings except for "woman". It is worth noting that women's job converges with men's job on potency dimension and almost overlaps with men's job on activity dimension. This pattern clearly suggests that women have been moving into occupations with higher potency and somewhat less active (expressiveness) jobs, which are

traditionally occupied by men. This pattern is consistent with queuing theory which argue that those occupations will usually experience less segregation under growth. Therefore it lend me some confidence about my data quality.

(A)



(B)



(C)

Figure 4: EPA profiles of man, woman, men's jobs, and women's jobs in 1978 and 2003 from both sexes perspective.

Second, with respect to the the expected convergency of cultural meanings between gender identity and occupational identities according to sex-role socialization perspective and job queue argument, the findings are somewhat mixed in the graphs. From men's perspective, woman and women's job are getting closer in their meanings on evaluation and activity diemensions over time. In contrast, women in general perceive a more divergent pattern between the gender identity and occupational identities.

Also there is some evidence in the graphs indicating gender identity and occupational identities are moving into the same direction. For example, figure on the panel (B) left shows when women's job becomes increasingly more powerful, so does their gender identity. What we do not know with the current data, however, is that whether their gender identity accommodate job identities when women move to powerful job or vice versa. Future study with more wave of data may answer this directional question.

Last but not least, the discrepancy of the meaning of "woman" between sexes may well reflect the fact that gender ideology, especially the meaning of a woman, has been diverging on differnent dimensions over time. Besides to the labor market, the household role played by women is yet another major source for their identity meaning. We are not sure why men perceive woman as less good or nicer even though they hold the belief that women's job are becoming more postive over time. Again the current data limits my ability to answer questions such as where is the mismatch comes from. Future study can look at the gender identity from different sources to test this supposition.

CHAPTER 5

CONLUSION AND DISCUSSION

Conclusion

I set out to ask a basic question that how we can explain the persistence of gender segregation in our society over the major historical transformation in its socioeconomic base? Followed by the review literature in gender segregation mainly from two fields, gender research and occupational segregation research, I argued that both areas have yet to pay enough attention to the two reinforcing forces at the macro-level that might have caused the changing dynamics of sex segregation in the labor market. I posited that the reciprocal effects between cultural beliefs about gender and occupational identity and the social structural arrangement in employment may help researchers to dismantle the puzzle.

To examine the relationship, I measured the cultural beliefs as a serious of meanings and symbols in a three dimensional spaces, namely, *Evaluation, Potency,* and *Activity*. The sex composition of occupations was the structure arrangement in employment. According to cultural argument of gender segregation, I predict that the more consonant the beliefs about gender identity (woman) and occupational identity, the more likely we will observe growth in women's proportion within occupations over time. Moreover, given the cultural lag effect, this relationship will become stronger over longer time period.

I tested these two predictions in my data. First, the research did not find support for the cultural argument for gender segregation. The (dis)consonance between gender identity and occupational identities meaning did not predict the larger growth of same-sex occupants in

occupations over time, even after controlling for the main effects of the identities meanings. On the other hand, my study is somewhat consistent with the argument made by queuing theorists (Reskin 1993; Reskin and Roos 1990) that when occupations, especially high-skill jobs, experience expansion, employers will have to hire people further down the labor force queue since the favored groups are not enough to keep the growth. What I found in this study is that positions that were perceived to more power and less expressiveness in 1978, those of which was occupied by men, experience larger growth of female worker in their composition after controlling for the distance between identity meanings over time.

Interestingly, both of multivariate analyses and the supplementary descriptive analysis display a similar pattern for the relationship between evaluation and potency for gender and occupational identities. When women back in 1978 concentrated in positions that were less powerful, they were perceived very good and nice in men's eyes. However, this positive evaluation from men dropped dramatically when women started moving to high power job. It almost seems that women trade their niceness in exchange for power in our society. In other words, we tend to think women are nicer when they hold lower power jobs. Previous studies have found that high status or competence is associated with low warmth or communality (refers to an emotional, interpersonal orientation) (Conway, Pizzamiglio, and Mount 1996; Fiske, Cuddy, Glick, and Xu 2002; Ridgeway and Lynn 1999).

In their experimental study, Conway et al. (1996) demonstrated that participants rated female targets who held high-status occupations as less communal whereas the male targets held low-status occupations were considered as more communal and less agentic (assertive) than other men. Despite men's derogating rating of evaluation to "woman", women are holding a much more positive perception toward themselves. Although it is out the scope of this thesis, I

speculate that other sources of identities (mother, wife, etc.) might also contribute niceness to women's gender identity.

There are two other segments in my diagram (figure 3) I have yet to investigate. The structural argument of gender segregation, implied in queuing theory, suggest that the changed sex composition of labor force queues would affect the job queues people rank. Thus we will expect to see the cultural beliefs adaptation gradually to the changing sex composition of jobs. And the third is a somewhat unclear reinforcing nature of structural and cultural change. I did not test these relationship in this thesis due the data constrain. However, I believe these suppositions are highly possible and future work can test this hypothesis.

Discussion and Limitation

While others have emphasized micro-level interpretive and meso-level interactional approaches that view gender as either roles or patterns of behavior and organizational practices, my model is predominately cultural, giving priority to the cultural beliefs about gender identity and occupational identities over the individual in the explanation of structural change in gender composition of occupations. I agree that individual's choice and preference and their interaction in organizations might play a role in the occupation segregation. However, I do argue that this micro-level and meso-level causal attribution of a macro-level phenomenon (structural change) is somewhat problematic.

Despite the fact that I did not find support for the cultural argument, do the findings about changed gender composition of occupations imply that the cultural beliefs are not a driven force for the structural change some might have assumed? To my knowledge, no studies have sought to explicitly test the reciprocal relationship between cultural belief and social structure. Such evidence would help evaluate the forces for changes on both directions and broaden the

discussion about the gender segregation in general. Unfortunately, the affect control database contains a limited number of identities over several time points. In separate analyses, I evaluated its influence at later time point (2003, with 43 occupational identities) but failed to find evidence to support either of these arguments.

Like all research, this thesis has limitations. Some of which have been addressed earlier. First, the occupation list from affect control theory database only contains 43 identities in 2003, only 32 of which were in the 1978 data. The small number of occupational identities in 2003 limits my power to test the second and third components of my overall model. Give that small sample size would jeopardize the sufficient statistical power to establish the relationship between gender and occupational identity meaning discrepancy and gender composition of occupations, I did not include them in my sample and models. A large occupational identities sample at the second time points would be necessary, however, to reveal statistically significant results. It would be interesting and valuable theoretically to include recent sentiment ratings of these identities to test the reciprocal relationship between cultural beliefs and structure. An important next step is to test the predictions with new waves of data. With the new wave of ACT data collection currently underway, researchers can test the relationship in the future studies. Yet at the same time, this affect control dictionary is the only one data that measure cultural beliefs about gender and occupations.

Second, I consider education, union membership rate, and socioeconomic status in each occupation to control for factors that might influence gender segregation structurally. There might be factors other scholars have found also contributed to the gender segregation which I could not measure or include in this study, such as discrimination from employer, personal preferences, etc. It could be difficult to examine the effects of discrimination and personal

preferences on the reciprocal relationship using occupational level data. Moreover, there is a specific need for research to study the cross-level effect of gender system, especially empirical studies focusing on both macro- and micro- level stratification.

Even given the limitations of the data used here, these findings show that cultural sentiments have their role in predicting social structure. The next task for gender scholar and stratification researchers is to recognize and model the change of culture and structure and compare the relationship between the two while incorporating standardized yet simple techniques and measurements, such as the affective meaning proposed by affect control theorists.

REFERENCES

Allison, Paul D. 1990. "Change Scores as Dependent Variables in Regression Analysis." Sociological Methodology 1990.

Archer, John. 1996. "Sex Differences in Social Behavior: Are the Social Role and Evolutionary Explanations Compatible?" American Psychologist 51:909-917.

Berger, Joseph, M. Hamit Fisek, and Thomas L. Conner. 1970. Expectation States Theory: A Theoretical Research Program. Cambridge, MA: Winthrop.

Berger, Joseph, Susan J. Rosenholtz, and Morris Zelditch Jr. 1980. "Status Organizing Processes." Annual Review of Sociology 6:479-508.

Bielby, William T. and James N. Baron. 1986. "Men and Women at Work: Sex Segregation and Statistical Discrimination." American Journal of Sociology 91:759-799.

Blau, Francine D, Marianne A. Ferber, and Anne E. Winkler. 1998. The Economics of Women, Men, and Work. Upper Saddle River, NJ: Prentice Hall.

Buss, David M. 1995. "Psychological Sex Differences: Origins Through Sexual Selction." American Psychologist 50.

Carli, Linda L. 1999. "Gender, Interpersonal Power, and Social Influence." Journal of Social Issues 55:81-99.

Cejka, Mary Ann and Alice H. Eagly. 1999. "Gender-Stereotypic Images of Occupations Correspond to the Sex Segregation of Employment." Personality and Social Psychology Bulletin 25:413-423.

Census. 1970. "Detailed Occupation of Employed Persons by Race and Sex: 1970." in United States Summary 1-739. United States: Bureau of Census.

Census. 1980. "Detailed Occupation of the Civilian Laobr Force by Sex, Race, and Spanish Origin: 1980." United States: Bureau of Census.

Census. 2000. "Summary File 3." United States: Bureau of Census.

Charles, Maria and David B. Grusky. 2004. Occupational Ghettos: The Worldwide Segregation of Women and Men. Stanford, Calif.: Stanford University Press.

Collins, Randall. 1981. "On the Microfoundations of Macrosociology." American Journal of Sociology 86:984-1014.

Conway, Michael, M. Teresa Pizzamiglio, and Lauren Mount. 1996. "Status, Communality, and Agency: Implications for Stereotypes of Gender and Other Groups." Journal of Personality and Social Psychology 71:25-38.

Correll, Shelley J., Stephen Benard, and In Paik. 2007. "Gettting a Job is there a motherhood penalty?" American Journal of Sociology 112:1297.

Cotter, David A., Joan M. Hermsen, and Reeve Vanneman. 2001. "Women's Work and Working Women: The Demand for Female Labor." Gender & Society 15:429-452.

Deutsch, F. M. 2007. "Undoing Gender." Gender & Society 21:106-127.

Duncan, Otis Dudley and Beverly Duncan. 1955a. "A methodological analysis of segregation indexes." American Sociological Review 20:210-217.

Duncan, Otis Dudley and Beverly Duncan. 1955b. "Residential Distribution and Occupational Stratification." American Journal of Sociology 60:493-503.

Eagly, Alice H. and Valerie J. Steffen. 1984. "gender stereotypes stem from the distribution of women and men into social roles." Journal of Personality and Social Psychology 46:735-754.

Eagly, Alice H. and Wood Wendy. 1999. "The Origins of Sex Differences in Human Behavior: Evolved Dispositions Versus Social Roles." American Psychologist 54:408-23.

Epstein, Cynthia Fuchs. 2007. "the cultural cognitive and social bases of the global subordination of women." American Sociological Review 72:1-22.

Fiske, Susan T., Amy J. C. Cuddy, Peter Glick, and Jun Xu. 2002. "A model of (often mixed) stereotype content: Competence and warmth respectively follow from perceived status and competition." Journal of Personality and Social Psychology 82:878-902.

Greenstein, Theodore N. 2005. "Gender Ideology Marital Disruption and the Employment of Married Women." Journal of Marriage and Family 57:31-42.

Hara, Junsuke. 2000. "Changes in the Labor Market and Occupational Prestige Scores." International Journal of Japanese Sociology 9:21–33.

Hauser, Robert M. and John Robert Warren. 1997a. "Socioeconomic Indexes for Occupations: A Review, Update, and Critique." Sociological Methodology 27:177-298.

Hauser, Robert M. and John Robert Warren. 1997b. "Socioeconomic Indexes for Occupations: A Review, Update, and Critique." Sociological Methodology 27:177-298.

Heise, David R. 1979. Understanding Events: Affect and the Construction of Social Action. New York: Cambridge University Press.

Heise, David R. 2010. Surveying Cultures: Discovering Shared Conceptions and Sentiments. Hoboken, New Jersey: John Wiley & Sons, Inc,.

Hirsch, Barry T. and David A. Macpherson. 2003. "Union membership and coverage database from the current population survey." Industrial and Labor Relations Review 56:349-354.

Hopcroft, Rosemary. 2002. "Is Gender still a Status Characteristic?" Current Research in Social Psychology 7:339-346.

Hopcroft, Rosemary L. 2009. "Gender Inequality in Interaction An Evolutionary Account." Social Forces 87:1846-1871.

Johnson, David. 2005. "Two-Wave Panel Analysis: Comparing Statistical Methods for Studying the Effects of Transitions." Journal of Marriage and Family 67:1061-1075.

Kaufman, Robert L. 2002. "Assessing Alternative Perspectives on Race and Sex Employment Segregation." American Sociological Review 67:547-572.

Kaufman, Robert L. 2010. Race, Gender, and the Labor Market: Inequalities at Work. Boulder, CO: Lynne Rienner Publishers.

Kemper, Theodore D. and Randal Collins. 1990. "Dimensions of Microinteraction." The American Journal of Sociology 96:32-68.

Kessler, R. C. 1977. "Use of Change Scores in Criteria in Longitudinal Survey Research." Quality and Quantity 11:43-66.

Lavee, Yoav and Ruth Katz. 2002. "Divison of Labor Perceived Fairness and Marital Quality: The Effect of Gender Ideology " Journal of Marriage and Family 64:27-39.

Lee, James Daniel. 1998. "Which Kids Can "Become" Scientists? Effects of Gender, Self-Concepts, and Perception of Scientists." Social Psychological Quarterly 61:199-219.

Lin, Nan and Wen Xie. 1988. "Occupational Prestige in Urban China." American Journal of Sociology 93:793-832.

Lovaglia, Michael J., Jeffrey W. Lucas, Jeffrey A. Houser, Shane R. Thye, and Barry Markovsky. 1998. "Status Processes and Mental Ability Test Scores." The American Journal of Sociology 104:195.

Mackinnon, Neil J. and Tom Langford. 1994. "The Meaning of Occupational Prestige Scores: A Social Psychological Analysis and Interpretation." The Sociological Quarterly 35:215-245.

Massey, Douglas S. 2006. Categorically Unequal: The American Stratification System New York: Russell Sage Foundation.

Mills, Mary Beth. 2003. "Gender And Inequality in the Global Labor Force." Annual Review of Anthropology 32:41-62.

Moore, Christopher D. and Dawn T. Robinson. 2006. "Selective Identity Preferences: Choosing from Among Alternative Occupational Identities." Advances in Group Processes 23:253-281.

Nakao, K. and J. Treas. 1994. "Updating Occupational Prestige and Socioeconomic Scores: How the New Measures Measure Up." Sociological Methodology 24:1-72.

Oppenheimer, Valerie K. 1973. "Demographic Influence on Female Employment and the Status of Women." American Journal of Sociology 78:946-961.

Osgood, Charles E. 1962. "Studies of the Generality of Affective Meaning Systems." American Psychologist 17:10-28.

Osgood, Charles E., William H. May, and Murray S. Miron. 1975a. Cross-Cultural Universals of Affective Meaning: Urbana, IL: University of Illinois Press.

Osgood, Charles E., George J. Suci, and Percy H. Tannenbaum. 1957. The Measurement of Meaning: Urbana, IL: University of Illinois Press.

Osgood, Charles Egerton, William H. May, and Murray S. Miron. 1975b. Cross-Cultural Universals of Affective Meaning. Urbana, IL: University of Illinois Press.

Padavic, Irene and Barbara Reskin. 2002. Women and Men at Work. Thousand Oaks, California: Sage Publication, Inc.

Priebe, John A. and Mary C. Kirk. 1990. "Detailed Occupation of the Civilian Labor Force by Sex, Race, and Hispanic Origin. 1990." U.S. Department of Commerce Economics and Statistics Administration Bureau of Census.

Reskin, Barbara. 1993. "Sex Segregation in the Workplace." Annual Review of Sociology 19:241-270.

Reskin, Barbara and Patrick Roos. 1990. Job Queues, Gender Queues: Explaining Women's Inroads into Male Occupations. Philadelphia PA: Temple University Press.

Rich, Brian L. 1995. "Explaining Feminization in the U.S. Banking Industry, 1940-1980: Human Capital, Dual Labor Market or Gender Queuing?" Sociological Perspective 38:357-380.

Ridgeway, Cecilia L. 1991. "The social Construction of Status Value: Gender and Other Nominal Characteristics." Social Forces 70:367-386.

Ridgeway, Cecilia L. 1997. "Interaction and the conservation of gender inequality considering employment." American Sociological Review 62:218-235.

Ridgeway, Cecilia L. and Shelley J. Correll. 2004. "Unpacking the Gender System: A Theoretical Perspective on Gender Beliefs and Social Relations." Gender and Society 18:510-531.

Ridgeway, Cecilia L. and Smith-Lovin Lynn. 1999. "The Gender System and Interaction." Annual Review of Sociology 25:191-216.

Ridgeway, Cecilia L. and Lynn Smith-Lovin. 1999. "Gender and Interaction." in Handbook of the Sociology of Gender, edited by J. S. Chafetz. New York: Kluwer Academic/ Plenum Publishers.

Solis, Hilda L. and Keith Hall. 2010. "Woman in the Labor Force: A Databook." U.S. Department of Labor and U.S. Bureau of Labor Statistics.

Thebaud, Sarah. 2010. "Gender and Entrepreneurship as a Career Choice: Do Self-assessments of Ability Matter?" Social Psychological Quarterly 73:288-304.

Thorne, Barrie. 1993. Gender Play: girls and boys in school. New Brunswick, N.J.: Rutgers University Press.

Tolbert, Charles, Patrick M. Horan, and E. M. Beck. 1980. "The Structure of Economic Segmentation: A Dual Economy Approach." American Journal of Sociology 85.

Tomaskovic-Devey, Doanld. 1993. Gender and Racial Inequality at Work: The Source and Consequences of Job Segregation. Ithaca, NY: ILR Press.

Treiman, Donald J. 1977. Occupational Presitge in Comparative Perspective: New York, NY: Academic Press, Inc.

Trivers, R. L and D. E. Willard. 1973. "Natural selection of parental ability to vary the sex ratio of offspring." Science 179.

Valerie, Oppenheimer. 1970. The Female Laobr Force in the United States: Demographic and Economic Factors Governing Its Growth and Changing Composition. Westport, CT: Greenwood.

West, Candace and Don H. Zimmerman. 1987. "Doing Gender." Gender and Society 1:125-151.

Wilson, Edward. 1978. On Human Nature. Boston, MA: Harvard University Press.

Appendix A:

Occupational identities in 1978 and 2003 data

Occupational Identity	2010 SOC Occupation Code	1978	2003
	11-0000 Management Occupations		
Executive	11-1011 Chief Executives	√	√
Manager	11-1020 General and Operations Managers	√	√
legislator/lawmaker	11-1031 Legislators		
Farmers	11-9013 Farmers, Ranchers, and Other Agricultural Managers	√	
Principal	11-9032 Education Administrators, Elementary and Secondary School	√	√
Funeral Director	11-9061 Funeral Service Manager	√	
Postmaster	11-9131 Postmasters and Mail Superintendents	√	
	13-0000 Business and Financial Operations Occupations		
Accountant/Auditor	13-2011 Accountants and Auditors	√	
	15-0000 Computer and Mathematical Occupations		
Computer Programmer	15-1131 Computer Programmers	√	√
Statistician	15-2041 Statisticians	√	
	17-0000 Architecture and Engineering Occupations		
Architect	17-1011 Architects, Except Landscape and Naval	√	
Engineer	17-2199 Engineers, All Other	√	
Technician	17-3020 Engineering Technicians, Except Drafters	√	
	19-0000 Life, Physical, and Social Science Occupations		
Scientist	19-1000 Life Scientists	√	
Chemist	19-2031 Chemists	√	
Psychologist	19-3030 Psychologists	√	
	21-0000 Community and Social Service Occupations		
Counselor	21-1010 Counselors	√	√
Social Worker	21-1020 Social Workers	√	
Clergy (clergyman)	21-2011 Clergy	√	√

Priest/Priestee Preacher/Pastor	21-2099 Religious Workers, All Other	√	√
	23-0000 Legal Occupations		
Judge/District Attorney	23-1023 Judges, Magistrate Judges, and Magistrates	√	√
(Defense/Divorce) Lawyer Attorney	23-1011 Lawyers	√	√
Stenographer	23-2091 Court Reporters	√	
	25-0000 Education, Training, and Library Occupations		
Lecturer/Instructor	25-1000 Postsecondary teachers	√	√
Elementary School Teacher	25-2021 Elementary School Teachers, Except Special Education	√	
Schoolteacher	25-2022 Middle School Teachers, Except Special and Career/Technical Educator	√	√
Librarian	25-4021 Librarians	√	√
	27-0000 Arts, Design, Entertainment, Sports, and Media Occupations		
Musician	27-2042 Musicians and Singers	√	
Actor	27-2011 Actors	√	
Athlete	27-2020 Athletes, coaches, umpires, and related workers	√	√
Coach	27-2022 Coaches and Scouts	√	√
Reporter	27-3022 Reporters and Correspondents	√	
Spokesman /Spokeswoman	27-3031 Public Relations Specialists		√
Author	27-3043 Writes and authors	√	
photographers	27-4021 Photographers	√	
	29-0000 Healthcare Practitioners and Technical Occupations		
Chiropractors	29-1011 Chiropractors	√	
Dentist	29-1021 Dentists	√	
Dietitians	29-1031 Dietitians and nutritionists	√	
Surgeon	29-1067 Surgeons	√	√
Physician/Doctor	29-1069 Physicians and Surgeons, all others	√	√
Registered Nurse	29-1141 Registered Nurses	√	√
Dental Hygienists	29-2021 Dental hygienists	√	
Practical Nurse	29-2061 Licensed Practical Nurse	√	√
	31-0000 Healthcare Support Occupations		

Dental Assistant	31-9091 Dental Assistants	√	
	33-0000 Protective Service Occupations		
Fireman	33-2011 Firefighters	√	
Bailiffs/Probation Officer	33-3011 Bailiffs, correctional officers, and jailers	√	
Detective/FBI Agent	33-3021 Detectives and Criminal Investigators	√	
Policeman/Cop/Sheriff Deputy (sheriff)/Patrolman	33-3051 Police and Sheriff's Patrol Officers	√	√
Bodyguard	33-9030 Security Guards and Gaming Surveillance Officer	√	√
	35-0000 Food Preparation and Serving Related Occupations		
Chef	35-1011 Chef and Head Cooks	√	
Headwaiter	35-1012 First-line Supervisor of Food Preparation and Serving Workers	√	
Cook	35-2010 Cooks	√	
Bartender	35-3011 Bartenders	√	
Busboy/Server	35-3021 Combined Food Preparation and Serving Worker, including Fast Food	√	√
Waiter/Waitress	35-3031 Waiters and Waitresses	√	√
Dishwashers	35-9011 Dishwashers	√	
Host/Hostess	35-9031 Hosts and Hostesses, Restaurant, Lounge, and Coffee Shop	√	√
	37-0000 Building and Grounds Cleaning and Maintenance Occupations		
Janitor/Door Keeper	37-2011 Janitors and Cleaners, Except Maids and Housekeeping Cleaners	√	
Maid/Housekeeeper	37-2012 Maids and Housekeeping Cleaners	√	
	39-0000 Personal Care and Service Occupations		
Bellhops	39-6011 Baggage porters, bellhops, and concierges	√	
Flight Attendant	39-6031 Transportation attendants	√	√
Baby Sitter	39-9010 Child care workers	√	√
	41-0000 Sales and Related Occupations		
Cashier	41-2011 Cashiers	√	
Shop Clerk	41-2021 Counter and Rental Clerks		√
Salesman/Saleswoman /Sales Clerk	41-2031 Retail Salespersons	√	√
Insurance Agent	41-3021 Insurance Sales Agents	√	
Real Estate Agent	41-9022 Real Estate Sales Agents	√	

	43-0000 Office and Administrative Support Occupations		
Telephone Operator	43-2021 Telephone Operators	√	
Bill Collectors	43-2099 Bill and account collectors	√	
Bookkeeper	43-3021 Bookkeeping, accounting, and auditing clerks	√	
Bank Teller	43-3071 Tellers	√	
File Clerk	43-4071 File Clerks	√	
Library Assistant	43-4111 Library assistants, clerical	√	
Receptionist	43-4171 Receptionists and Information Clerk	√	√
Mail Carrier	43-5052 Postal service mail carriers	√	
Secretary	43-6014 Secretaries and Administrative Assistants	√	√
Typists	43-9022 Word processors and typists	√	
	45-0000 Farming, Fishing, and Forestry Occupations		
Farm Laborer	45-2092 Farmworkers and Laborers, Crop, Nursery, and Greenhouse	√	
Fisherman	45-3011 Fishers and Related Fishing Workers		√
	47-0000 Construction and Extraction Occupations		
Construction Foreman	47-1011 First-Line Supervisors of Construction Trades and Extraction Workers	√	
Carpenters	47-2031 Carpenters	√	
Construction laborer	47-2061 Construction Laborers	√	
Blacksmith	47-2211 Steel Metal Workers	√	
Miner	47-5099 Extraction Workers, All Other	√	
Electrician	47-2111 Electricians	√	
Plumber	47-2152 Plumbers, Pipefitters, and Steamfitters	√	
	49-0000 Installation, Maintenance, and Repair Occupations		
TV Repairman	49-2097 Electronic Home Entertainment Equipment Installers and Repairers	√	
Auto Mechanic	49-3023 Automotive Service Technicians and Mechanics	√	
	51-0000 Production Occupations		
Baker	51-3011 Bakers	√	
Butchers	51-3021 Butchers and other meat, poultry, and fish processing workers	√	
Welder	51-4121 Welders, Cutters, Solderers, and Brazers	√	
Tailor/Dressmaker	51-6052 Tailors, Dressmakers, and Custom Sewers	√	

Shoe Repairman	51-6041 Shoe and Leather Workers and Repairers	√	
Textile Worker	51-6099 Textile, Apparel, and Furnishings Worker, All Others	√	
	53-0000 Transportation and Material Moving Occupations		
Airline Pilot	53-2011 Airline Pilots, Copilots, and Flight Engineers	√	
Bus Driver	53-3021 Bus Drivers, Transit and Intercity	√	
Truck Drivers	53-3030 Driver/sales workers and truck drivers	√	
Taxi Drivers	53-3041 Taxi drivers and chauffeurs	√	
Railroad Conductors	53-4031 Railroad conductors and yardmasters	√	
Parking Attendants	53-6012 Parking lot attendants	√	
Gas Station Attendant	53-6031Automotive and Watercraft Service Attendants	√	
Longshoreman	53-7062 Laborers and Freight, Stock, and Material Movers, Hand	√	
Garbage Collectors	53-7081 Refuse and recyclable material collectors	√	
	Miscellaneous (Occu do not match with 2010 Code)		
Auctioneer	284 (Code in 1990 Soc Code)	√	

Appendix B:

Sentiments toward gender identity by the sex of perceiver in 1978 and 2003

Sex of perceiver	Gender identity	EPA profile	**1978**	**2003**
Men	Men	Evaluation	1.08	0.82
		Potency	1.07	1.56
		Activity	0.56	0.86
	Women	Evaluation	2.34	1.27
		Potency	0.44	-0.24
		Activity	1.12	0.34
Women	Men	Evaluation	1.39	1.09
		Potency	1.01	1.96
		Activity	0.63	1.44
	Women	Evaluation	1.73	2.5
		Potency	0.68	1.52
		Activity	0.85	1.49