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**PARTICIPATION IN JOB TRAINING OVER WORKING LIFE AND
EMPLOYMENT OUTCOMES AMONG MID-CAREER WOMEN
IN THE UNITED STATES**

A Thesis in
Workforce Education and Development

by
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ABSTRACT

A review of women's labor force participation rates over the past years reveals that the population of mid-career women has been the fastest-growing and largest in the American female workforce. Women aged 45–64 have consistently increased their participation in and are becoming a significant portion of the labor force. Compared to young people's and males' human capital investments, the workforce composed of middle-aged and older women has not received significant research attention. Such attention is necessary, especially in light of the greater number of elderly poor women. The purpose of this study was to examine the relationships between job training participation and wage effects among women at mid-career in the United States.

This study used data from the National Longitudinal Survey of Young Women (NLSW) to explore whether mid-career women's participation in job training is related to their demographic characteristics, educational levels, and work experiences. The employment outcomes in terms of hourly wage rates associated with job training participation among women at late career were also investigated. Findings are summarized as follows.

First, significant relationships were found between participation in job training and race, education, occupation, and typical length of work duration each year among women at mid-career. Whites were more likely than non-Whites to participate in both on-the-job training (OJT) and other training courses or educational programs (Other training). Women with education beyond high school were more likely to receive OJT and other training than those who were high school graduates or less. Women who were

employed in professional, managerial, or technical occupations were more likely to receive both OJT and other training than those who worked in other occupations. In addition, the length of the duration of women's work each year was a significant factor affecting their training participation. Women who typically worked for longer durations each year had greater odds of receiving job training than those who worked a shorter duration each year.

Second, a significantly positive relationship was found between mid-career women's participation in OJT over their working life and their hourly wage rates. Women who had more OJT participation hours were more likely to have a higher wage rate than those who spent fewer hours on OJT. However, participation in other training showed no significant relationship with wage rates. Findings from this study also revealed that women who were White, had a higher education degree, worked in the manufacturing industry, worked in a professional, managerial, or technical occupation, and typically worked a longer duration each year, tended to receive a higher hourly rate of pay.

In summary, this study found a strong positive relationship between job training participation and wage rates among mid-career women. Women who were non-White, were high school graduates or less, worked in occupations other than a professional, managerial, or technical occupation, and typically worked a shorter duration per year were less likely to receive training and to earn a higher wage rate. Based on these findings, several recommendations may be offered to policy makers, social agencies, and HRD professionals regarding better training opportunities and earnings for mid-career women. These recommendations are summarized below.

1. There is a need to close the gap in post-school training acquisition for women who tend to receive less training. High school equivalency credentials and job skills training are particularly essential for non-White women in the United States.
2. These findings support the need to continually promote continuing education programs and training services for mid-career women. These programs should attempt to reinforce training access and minimize barriers.
3. The goal of training policies should be to improve women's job placements. Also, training policies should serve to enhance women's employability and job mobility by providing adequate job training after the usual schooling age, when they may work longer and thus remain longer in the labor market.

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Chapter 1

Introduction

Background

Dramatic movement in the U.S. economy after World War II has been accompanied by significant changes in women's participation in the paid labor force. Over the past decades, the female labor force participation rate has increased from 34% in 1950 to 60% in 2002, sharing 46% of the total labor force with males (Fullerton, 1999; U.S. Department of Labor, 2004a). According to an employment projection from the U.S. Department of Labor (2000), women's labor force growth will be faster than men's and will reach 48% by 2008. It is clear that the female workforce plays a role as important as the male workforce in today's economy.

Women at mid-career have been the fastest-growing and largest population in women's overall labor force participation rates over the past years (Fullerton, 1999). Mid-career women between the ages of 45 and 64 have consistently increased their participation in the workforce. According to the U.S. Department of Labor (2004a), women aged 55 and older are projected to achieve the highest annual growth rate among the overall civilian labor force from 2002 to 2012. This age group is becoming a significant portion of the labor force, and this growth will have direct impacts on the social and economic status of older women in the future.

With their increasing rate of participation in the workforce, women's human capital investments will need more attention in order to achieve higher returns and productivity. Job training and education are two fundamentals of human capital investment. According to Becker (1975), workers' productivities rely on learning new skills and mastering old skills. Training has long been identified as a crucial component of an organization's success and individual's career development.

Compared to formal schooling, job training is the major impetus in fostering human capital among middle-aged women at work and those who return to the labor market after taking care of domestic work. Job training is defined in this study as formal learning received by a worker that relates to a present or future job. It is either provided or sponsored by the worker, an employer, or a vendor. It includes courses taken at a job, courses taken somewhere else that relate to a job or a new career, or courses for a license or certification needed for a job. Bae's (2002) study showed that job training is positively associated with women's tenure and job satisfaction. Therefore, training investment is relatively essential for such a rapid growing workforce in terms of middle-aged women's labor market outcomes; it is also important for economic improvement as a whole.

Purpose of the Study

Mid-career women have a remarkable participation rate in the workforce, and their human capital investments and work attachment also vary over the life cycle. In this study, mid-career women are defined as the female U.S. civilian noninstitutionalized population aged 45 to 60 in the labor force. Using data from the National Longitudinal

Survey of Young Women (NLSW) (U.S. Department of Labor, 2003), factors associated with mid-career women's participation in job training, such as age cohort, race, marriage, education, industry, occupation, and typical work duration were examined in this study. Participation in job training is the time spent on job training, which is defined in this study as the total hours spent by workers on job training during the period from 1982 to 1999.

The main purposes of this research study were as follows:

1. To explore who in the mid-career group is more likely to receive job training.
2. To investigate how women's job training impacts on their employment outcomes in mid-life.
3. To conclude and make recommendations for reinforcing women's labor market returns.

Problem

The topics related to human capital investments and workforce education and development have received a great deal of attention since the dawn of industrialization. With the dramatic movement in the economy and advances in technology, education and job training are indispensable to the skilled labor force. However, compared to young people's and males' human capital investments, the group of middle-aged and older women has not received significant research attention. This knowledge gap has left researchers and policy makers with little information on the mid-career and older women's specific labor force needs and outcomes (Rife, 1997).

The other concern is women's economic security in their late life. Olson's (1990) study showed that 71% of the poor elderly are women. The majority of people aged 55 and over and living in poverty are unemployed women (Sandell, 1987). Although women's participation in the labor force has increased, the wage gap and unequal employment opportunities still exist and result in an inferior economic status for extended periods in their later life. An analysis of the factors affecting middle-career women's job training and associated outcomes is important to determining whether older women can mitigate their poverty through prior job training and longer employment.

Significance of the Study

Due to the rise in women's workforce participation, many researchers have been making significant efforts to examine the relationship between women's labor market activities and economic functioning. A considerable number of studies have focused on the wage gap, employment equality, gender discrimination, and on those popular topics in women's development. However, there are relatively few empirical studies on later training and outcomes for women at the middle of their careers.

The significance of this study has both economic and social impacts on women middle aged and older. First, this study attempted to determine if training will help these women achieve better economic returns. If women who receive training while returning to work after their 40s or later in life have higher wage levels than those who do not receive training, then training will enable women to deviate from poverty in late life. Second, by examining the factors and obstacles confronted by mid-career women, this

study will provide human resource development professionals, policy makers, and social welfare agencies with valuable information to fully develop the labor force and to improve all women's well-being.

Research Questions

This study investigated the following research questions:

1. Is women's participation in job training, including on-the-job training (OJT) and other training courses or educational programs (Other training), significantly affected by factors such as age cohort, race, education attainment, marital status, industry, occupation, and average work-weeks per year?
2. Does women's job training participation, including on-the-job training (OJT) and other training courses or educational programs (Other training), correlate with their hourly wage rates in 1999?

Conceptual Framework

In order to study job training participation and the associated employment outcomes for middle-aged people, it is essential to delineate the age profiles with human capital investment, employment activities, and returns over the lifecycle.

Weiss's (1986) lifecycle model, shown in Figure 1, highlights the evolution of education, job training, earnings, and working hours among four life phases. The model

is presented in a “typical” life course, which consists of four phases that a worker passes through: schooling, on-the-job training, work, and retirement.

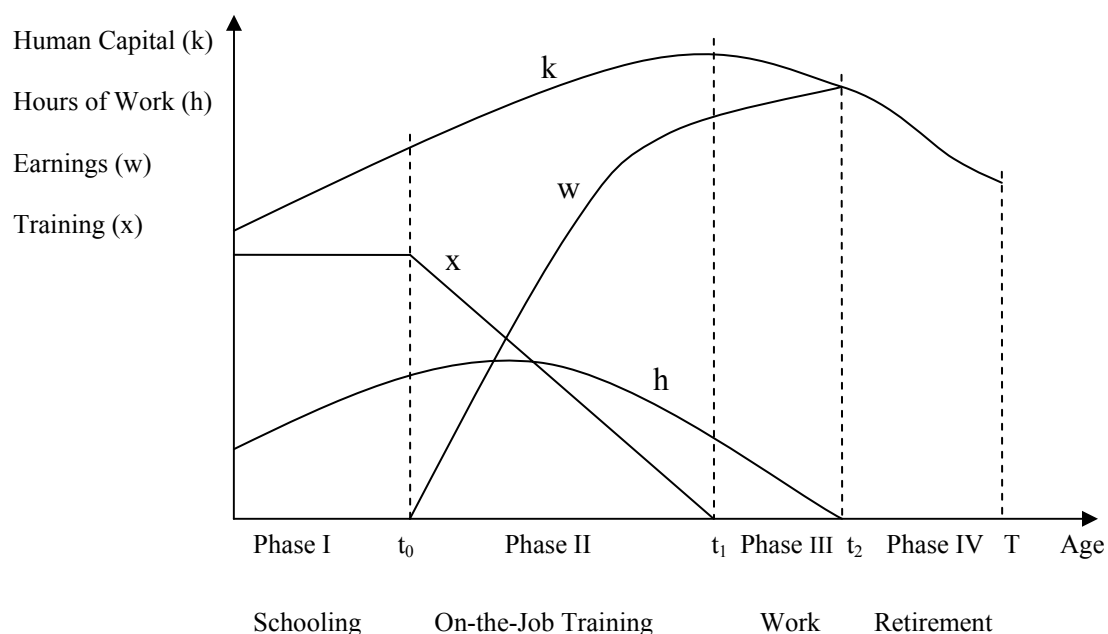


Figure 1. The age profiles of human capital, earnings, work, and investment in a lifecycle (adapted from Weiss, 1986, p. 622).

Beginning with schooling, human capital continually increases and declines at the end of work life. The wage rates rise dramatically at younger ages and increase slightly in the later work life. Both work hours and on-the-job training move in a downward direction while ages increase. It is notable that increases in human capital lead to greater earnings, which also conforms to Becker’s (1993) human capital theory that is an underlying theory in analyses of earnings profiles over the life cycle.

According to Mincer (1974), the life-cycle earnings profile reflects one's life-cycle pattern of productivity, which is associated in turn with one's investment in human capital. Human capital theory suggests that the upward-sloping earnings profiles particularly reflect investments in job training (Becker, 1993, p. 37).

Organization of the Thesis

This thesis is divided into five chapters. Chapter 1 provides an introduction to the study described in the thesis. A review of the related theories and empirical studies on training participation and employment outcomes is presented in chapter 2. The purpose of the chapter is to reveal existing knowledge and information that would aid the development of this research. Chapter 3 contains a description of the data, target population and sample, variables, and analysis methods. Findings from this study are reported in chapter 4, which is organized according to the research questions in this study. Chapter 5 provides a summary of this study and a discussion of the implications of the findings for the two research questions. Recommendations for practice and future research are also included.

Chapter 2

Literature Review

The focus of this paper was on exploring the factors that affect mid-career women's participation in job training and associated employment outcomes. Previous studies related to training and outcomes are summarized and analyzed in this chapter. To better assimilate the essence of theories and empirical evidence related to the subject of the research, this chapter is divided into two sections: job training participation and employment outcomes.

Job Training Participation

Knowledge, skills, work experience, good health, and the ability to labor are all important assets to sustaining lives and boosting learning for human beings. Although investments that cultivate these assets can exist in many forms, all forms of activities and the potential to improve people's capability and incur greater returns are considered investments in human capital. Participation in job training, such as prior education attainment, recurring education, and acquisition of any form of job training, is probably the most important human capital investment over the life cycle.

Human capital theory has long been recognized as an underlying theory that is useful in describing social and individual economic development over the life cycle. According to Becker (1993, pp. 17–21), training and education are the most important

investments in human capital, in which increased skills and knowledge of individuals are positively associated with productivity that brings greater earnings. Investment in training was also found to result in increases in wages (Lengermann, 1999).

Considering women's "traditional female" role as well as their labor market behaviors, investments in training and education of women may vary with different magnitude of incentive to them (Ehrenberg & Smith, 2000, p. 309). The major difference in making human capital investments between males and females has been in the length of work life compared to the ability to recoup the costs of the investments (Ehrenberg & Smith, 2000). To better understand the nature of training and education for women, theoretical and empirical studies about the acquisition of women's job training and education are reviewed in the following sections.

Job Training

Training is provided to workers in order to improve performance and productivity. Lawrie (1990) defined job training as changes in skills related to one's job. Training was also described as short-term learning related to an individual's present job (Nadler & Nadler, 1990). Rothwell and Sredl (2000, p. 9) associated job training with learning interventions that develop skills, knowledge, and attitudes to match current or future job requirements.

Job training is a broad term implying all forms of training related to one's job. It can be categorized into many types, such as on-the-job training (OJT), off-job-training, vestibule training, cross training, and planned and unplanned training (Rothwell & Sredl,

1992, pp. 481–485). In Rothwell and Sredl's (2000, p. 9) latest reference guide for the American Society for Training and Development (ASTD), job training is referred to in concert with the different methods of delivery: off-the-job, near-the-job, and on-the-job training.

Among these training categories, OJT is probably the most common form of training provided by employers. On-the-job training refers to training activities performed at the worksite, which is carried out before trainees are expected to produce or during the work itself (Rothwell & Sredl, 1992, p. 481). Employer-incurred training costs three to six times more with OJT than other forms of training (Carnevale & Gainer, 1989, p. 15). For OJT, time for learning and instruction and money for training materials are the major costs. However, these expenditures could be offset by increased productivity in subsequent periods (Barron, Berger, & Black, 1997).

OJT was found to be strongly associated with wage growth. Human capital theory suggests that earning growth is directly related to OJT (Becker, 1993, p. 30). In other words, OJT is an important training approach in explaining individuals' production and wage effect (Becker, 1993, pp. 29-31). In addition, many studies have argued that OJT is a useful approach in explaining the growth of wages with job tenure. For example, Hill (2001) examined post-school-age training among women at older ages. She found that OJT provides a wage advantage for women to stay in the labor market longer. Therefore, the more training people acquire, the more they can produce. The more they produce, the more they can earn. If wage growth is an important incentive in the labor market, people will stay longer in paid work.

Training participation is a joint decision made by both workers and employers (Barron, Berger, & Black, 1997). On the one hand, employers are more concerned about the costs of training and, meanwhile, are likely to allocate training investment on workers who are able to make sustainable returns. However, on the other hand, because of the earning effect from increased human capital, workers are more likely to stay at a firm that provides training.

The training decision can be further explained by Becker (1993, pp. 30-40), who categorized on-the-job training into two broad types: specific and general training. Specific training only benefits the firms that provide it; general training increases a worker's future productivity at other firms. In other words, specific training refers to training that targets skills and knowledge that can only be applied to a specific job. In contrast, while workers receive general training, the skills and knowledge learned can be transferred to other jobs or firms. As a result, "returns to general training may be greater than those to specific training" (Veum, 1995, p. 813). Meanwhile, workers are more willing to pay and receive general training and firms are more likely to welcome new workers if they have been trained with general skills.

Training Acquisition

Training acquisition, as well as the decision to train, is made by both employer and the employee. On the employee side, women who expect a shorter work life will be less likely to seek a job that requires high levels of training (Ehrenberg & Smith, 2000). Gamboa's (2002) study showed that the average number of years of paid work that

female workers expect at age 25 is 29.5 years, which is 5.1 years less than for males. Within the occupations that require skills, women work four fewer hours than men per week (Gamboa, 2002). Similarly, employers tend to hire and provide more training to those who have a longer work life or more work hours in order to have higher returns on their training investment. Using data from the National Longitudinal Surveys of Youth 79, Bae (2002) demonstrated that female workers are less likely than males to receive training. Gender remains significant in all six logistic regression models (i.e., race, residency, family income, GPA, parents' education, aptitude, and education level) of effect on training acquisition (Bae, 2002, p. 115). Moreover, women were found to receive 6.1 fewer employer-provided training hours than men in a six-month period (Frazis, Gittleman, Horrigan, & Joyce, 1998).

The discrepancy in training between women and men reflects the differences in duration and intensity of training. According to data from the National Longitudinal Survey of Youth 79 ("Training," 1993), 22.3% of males received employer-provided training while only 18.4% of females received employer-provided training in the same period of time. Individuals who had received job training averaged a total of seven weeks in training over a five-year period, while women spent two weeks less than men in training. The disparity results from the low receipt of training among females who have low labor market attachment. However, there is no difference in probability of training received among individuals who had worked more than 200 weeks ("Training," 1993).

The acquisition of training is also associated with aptitude and educational level. Women with Armed Forces Qualifying Test scores above 80 received longer durations of training than other women ("Training," 1993). More educated women were found to

receive more training than other women. Women who acquired more training tended to work to older ages (Hill, 2001). The other evidence was revealed by Lynch's study (1992), which indicated that women with more education and training will remain longer in the labor market. Compared to education, training tends to benefit women more than education that obtained later in their later life in terms of labor force attachment and wages (Hill, 2001).

Education

Unlike job training emphasizing the short-term effect on the improvement of skills and productivity, education is referred to as job preparation for increasing individual opportunity in the labor market (Gray & Herr, 1998, p. 4). Gray and Herr defined workforce education as a form of pedagogy that is offered at the pre-baccalaureate level to prepare students, clients, or incumbent workers to be more competitive in the labor force. It is also defined as intermediate-term learning to help individuals qualify for job advancement and achieve their future career goals (Rothwell & Sredl, 1992). Both job training and education help transmit knowledge and skills to perform a better job.

People may attend a variety of educational programs while employed. The programs range from in-house or public seminars to participation in degree-related programs in colleges, which are beyond the scope of job duties held currently by individuals (Nadler & Nadler, 1990). Nevertheless, many major corporations in America have offered some kinds of employee education programs (Carnevale, Gainer, & Villet,

1990). Some of these programs are designed to prepare workers moving from current positions to other positions within the same organization. Others enable people to prepare for emerging opportunities within their present work units (Nadler & Nadler, 1990).

Education Attainment

Women's human capital investment in education has dramatically changed in recent decades. Prior to the 1970s, women were more likely to graduate from high school than men but less likely to attend college (Becker, 1993, p. 18; U.S. Department of Education, 2000). Today, women have a higher rate of college enrollment than men. According to the U.S. Department of Education (1997), women's college enrollment rates among new high school graduates reached 70% in the late 1990s, which is about 10% higher than the men's rates. Among women who were enrolled in degree-granting institutions in the fall semester from 1970 to 2000 (including full- and part-time enrollment), the average enrollment rate for those who were aged 35 and over was 19%, compared with 13% for men who were aged 35 and over (U.S. Department of Education, 2002a). More women earned associate, bachelor's, and master's degrees than men during 1985-2000, and the number of women obtaining all types of degrees has grown at a faster rate than for men. The number of bachelor's degrees awarded to men rose by 6% between 1990-91 and 2000-01, while those awarded to women increased by 21% (U.S. Department of Education, 2002b).

The rates of labor force participation and unemployment differ by educational attainment. People who have higher levels of educational attainment are more likely to

participate in the labor force than those who have lower levels of education. The U.S. Department of Education (2002c) reported that about 79% of adults (including those who were employed and those actively seeking employment) aged 25 and older with a bachelor's degree or higher participated in the labor force in 2001, compared with 64% of persons who were high school graduates. In contrast, only 44% of those aged 25 and older, who were not high school completers, were in the labor force (U.S. Department of Education, 2002c). Among women aged 25 and over, 73.3% of those with a bachelor's degree or higher participated in the labor force in 2001, compared with a rate of 55.8% for those with high school diplomas (U.S. Department of Education, 2002c).

Persons with lower levels of education are more likely to be unemployed than those who have higher levels of education. According to the Digest of Education Statistics (U.S. Department of Education, 2002d), the 2001 unemployment rate for adults aged 25 and older who had not completed high school was 7.3%; 4.2% for those who graduated from high school; and 2.3% for those with a bachelor's degree or higher. Among women aged 25 and over, the 2001 unemployment rates for those with high school diplomas was 4%, compared with 2.3% for those with a bachelor's degree or higher (U.S. Department of Education, 2002d).

Employment Outcomes

Training Effects on Earnings

Human capital theory has long been recognized as an underlying theory in analyzing earnings profiles over the life cycle. The life-cycle earnings profile reflects one's life-cycle pattern of productivity, which is associated in turn with one's investment in human capital (Mincer, 1974). The age-earnings profile increases with human capital investment when people are young, becomes flatter when people get old, and decreases because of the depreciation of human capital (Mincer, 1993). Human capital theory suggests that the upward-sloping earnings profiles particularly reflect investments in job training (Becker, 1993, p. 37). This explains why workers who receive training earn higher wages than those who are not trained. The theory also analyzes employees' and employers' incentives to invest in job training and their expected monetary returns to the training decisions (Ehrenberg & Smith, 2000, p. 309).

Becker (1993, pp. 30-40) classified on-the-job training into two types: specific and general training. Specific training increases productivity only in the firm that provides it. While workers receive general training in one firm, the skills learned will be transferable to other firms. In short, specific training only benefits the firm that provides it; but general training increases a worker's future productivity at other firms. The human capital model predicts that both specific and general training foster wage growth, while the individual and social returns to general training are greater than the returns to specific training because general training is more transferable to other firms and more portable across employers (Veum, 1995, p. 813).

Many empirical studies have determined the relationship between job training and wage growth by using data from the National Longitudinal Surveys of Youth 79 (U.S. Department of Labor, 2004b). Schochet (1991) found that the amount of time spent by young males in training programs, such as company training programs, government programs, vocational programs, and apprenticeship programs, is positively related to earnings. Lynch (1992) examined the effects of OJT, off-the-job training, and apprenticeship acquisition on wages among young workers. The number of weeks spent in OJT and apprenticeship in present companies was found to be significantly related to wage growth. However, the OJT received from the previous companies showed no effect on wages. Off-the-job training and apprenticeships received prior to the current employment have positive impact on wages (Lynch, 1992).

Training acquisition is also found to be positively related to women's economic returns (Bae, 2002; Hill, 2001). Training results in different degrees of impact on wage level in different career phases. Bae (2002) found that training has positive wage effects among women in their later careers, but no significant effect on wage growth early in a career. Hill's (2001) study determined training impacts on wage changes among women aged 47 to 61, using data from the National Longitudinal Surveys of Mature Women cohort. She found that women's hourly wage rates increase with training acquisition especially with the on-the-job training received at older ages (Hill, 2001). If it is true that training provides a wage advantage for older women in the labor market, job training might enhance women's labor force participation. Indeed, later training is associated with increases in wage levels and larger labor force participation at older ages (Lynch, 1991).

Women's Labor Market Participation

Women's participation in the paid labor force has changed significantly. Over the past decades, the female labor force participation rate has increased from 34% in 1950 to 60% in 2002 (U.S. Department of Labor, 2004a). According to an employment projection from the U.S. Department of Labor (2004a), the women's civilian labor force growth will be faster than that for men and is expected to increase by 1.3% annually from 2002-2012, and will total 48% by 2008. The female workforce is playing as important a role as the male workforce in today's economy.

The growing labor workforce participation rate for women has been represented by different age groups at different times. Between 1950 and 1965, older married women were the largest group contributing to the increase (Kahne & Kohen, 1975). In the 1970s, young married women were most represented in the upward trend (Kahne & Kohen, 1975). More recently, women between the ages of 45 and 64 have consistently increased their participation in the workforce (Fullerton, 1999). Women aged 45 to 54 represented 76% of the female workforce in 2002, and women aged 55 and older are projected to achieve the highest annual growth rate among the overall civilian labor force from 2002 to 2012 (U.S. Department of Labor, 2004a). The group of middle-aged and older women is becoming an important portion of the labor force and has a significant impact on the social and economic status of older women in the future. Moreover, aging is expected to play a dominant role in the labor market (Fullerton, 1999).

Job Mobility

Job mobility is an important component of employment outcomes, and can move an individual's career progress in the labor market toward a stable and mature stage (Topel & Ward, 1992). Job mobility, in terms of job change, turnover, occupational change, and moving from one employer to another, can be interpreted according to several explanations. The rates of job mobility might vary with gender, race, age, wage level, occupation, and accumulation of human capital investment.

According to Lynch (1991), people tend to change their jobs more often early on and have more stable employment when they have more work experience. Using the Longitudinal Employee-Employer Data (LEED), Topel and Ward (1992) found that a typical worker will hold seven jobs during their first ten years in the labor market, which is about two thirds of the total number of jobs in a lifetime. Higher rates of job mobility among young workers can be traditionally attributed to three theoretical explanations: job search, job match, and wage effect (Lynch, 1991).

First, information about the job search, including where to find a job and the acquisition of a job, is difficult for young people to obtain, compared with the information-seeking abilities of older people who have more labor market experience (Lippman & McCall, 1976). Second, whether or not a job is matched can be learned by gaining an understanding of and fostering acceptance between employees and employers. Jovanovic's (1984) learning model suggests that workers and firms discover one another's unobserved characteristics over time, such as workers' actual productivity, loyalty, commitment, and uncompensated aspects of jobs. Therefore, good and bad job

matches may reflect on the job tenure and the probability of leaving an employer. Third, changes in wages are also a prominent determinant in job-change decisions. If wage rate is an important incentive for work, people will accept employment and stay in a job that offers a higher wage rate than other alternatives. Murphy and Welch (1990) estimated the structure of wage growth over the career. They found that nearly two thirds of high school graduates' lifetime wage growth occurs in the first ten years of their career, which is about the same fraction of lifetime job changes revealed in Topel and Ward's (1992) study. Job turnover and wage growth seem to decline as a career progresses. Wage plays a key role in career transition to stable employment.

Unemployment

With a significantly rising proportion of women in today's labor force, the concern about unemployment for women is as important as it is for men. According to the U.S. Census Bureau (2004), unemployed persons are defined as all civilians aged 16 and over who were available for work, had no employment, and had made efforts to seek jobs during the previous four weeks. Women and men's unemployment rates have been very close since the 1980s (U.S. Department of Labor, 2004c). However, among women, the unemployment rates vary with different races, age groups, and marital status.

According to data from the Current Population Survey (CPS) from the U.S. Department of Labor (2002), the unemployment rate for white women was 4.9% in 2002, compared to 9.8% for blacks, 5.7% for Asians, and 8% for those of Hispanic origin. Younger women are more likely than older women to experience unemployment. Women

aged 44 and younger had an average unemployment rate of 7.3% in 2002, while women aged 45 and over had a rate of 4% (U.S. Department of Labor, 2002). Moreover, unmarried women, including never married, divorced, separated, and widowed, were more likely to be unemployed than those who are married with spouse presented in 2002 (U.S. Department of Labor, 2002).

Summary

This chapter reviewed both theoretical and empirical studies on women's participation in job training and the associated employment outcomes. The first part in this chapter was underlaid by the human capital theory; issues regarding women's training acquisition and education attainment were also presented. The second part, employment outcomes, contained a discussion of the empirical evidence with respect to labor market effects among women at mid-career, including training effects on earnings, trends in labor market participation, job mobility, and unemployment.

All forms of activities and potential, such as schooling, knowledge and skills acquisition, work experience, good health, attitude, learning ability, etc., that improve people's capability and incur greater returns are considered investments in human capital. Job training and education are two significant investments in human capital that create greater productivity and were found to have a direct impact on earnings (Becker, 1993, pp. 17-21; Lengermann, 1999).

Training and education differ by definition and with the decision to make investments in which the costs of the investments can be retrieved. Training is referred to

as a short-term learning intervention related to a present job; on the other hand, education is defined as intermediate-term learning to prepare for a future job. The length of a work life has been historically found to be an incentive to individuals as they make investments in training and education. Women who expect a shorter work life will be less likely to seek a job that requires high levels of training (Ehrenberg & Smith, 2000). Employers tend to hire and provide more training to those who will have a longer work life or work more hours in order to have higher returns on their investment. Also, female workers were found to expect fewer years of paid work than males. Within the occupations that require skills, women worked fewer hours of paid work per week than men (Gamboa, 2002). Moreover, many empirical studies show that female workers are less likely than males to receive training (Bae, 2002; Frazis, Gittleman, Horrigan, Joyce, 1998; “Training,” 1993).

Due to the dramatic growth in women’s labor force participation in recent decades, many employment outcomes have drawn the attention of researchers. First, changes in wages were found to be the result of job training. Human capital theory suggests that the upward-sloping earnings profiles particularly reflect investments in job training (Becker, 1993, p. 37). This explains why workers who receive training have higher wages than those who are not trained. Also, many empirical studies have demonstrated a direct relationship between job training and earnings (Lengermann, 1999; Lynch, 1992; Schochet, 1991). Training was found to incur different degrees of impact on wage levels in different career phases. Bae (2002) found that training has a positive wage effect among women in their later careers, and Hill’s (2001) study shows that

women's hourly wage rates increase with training acquisition, especially with the OJT received at older ages.

Second, the group of middle-aged and older women is becoming an important portion of the labor force. Women aged 45 to 54 represented 76% of the female workforce in 2002, and women aged 55 and older are projected to achieve the highest annual growth rate among the overall civilian labor force from 2002 to 2012 (U.S. Department of Labor, 2004a). Aging is expected to play a dominant role in the labor market. Third, with the increase of women in the labor force, unemployment rates for women are a noticeable labor market concern, as they are for men. Among women, unemployment rates vary with different races, age groups, and marital status. Women who are white, aged 45 and over, and married are less likely than others to experience unemployment (U.S. Department of Labor, 2002).

Chapter 3

Methodology

The purpose of this study was to explore which women in the mid-career female group were more likely to receive job training. The employment outcomes were also investigated in terms of hourly wage rates associated with job training among these women. This chapter provides a description of the research methodology used in this study, including the data, sampling procedures, data collection, target population and sample, variables, and data analysis methods.

Data

National Longitudinal Survey of Young Women (NLSW)

The data used in this study were from the National Longitudinal Survey of Young Women (NLSW) (U.S. Department of Labor, 2003). NLSW is a set of panel data governed by the Bureau of Labor Statistics (BLS), an agency of the U.S. Department of Labor. The collection of data was administered by the Census Bureau and managed by the Center for Human Resource Research (CHRR) at the Ohio State University. NLSW is one of four original surveys in the NLS program, and is primarily designed to describe women's labor market activities and family background. The NLSW was first conducted in 1968, composed of 5,159 female respondents between the ages of 14-24 as of December 31, 1967. The latest interview was conducted in 2001 with a total of 2,806

participants remaining. All 21 rounds of data are available to the public (U.S. Department of Labor, 2001).

The NLSW contains three major types of respondent's information: (a) labor market status, work experience, occupation, job training, education attainment, and earnings; (b) marital status, spouse background, household composition, and fertility history; and (c) age, sex, race, geographic characteristics, health status, and household responsibilities (U.S. Department of Labor, 2001). The same or similar questions were asked repeatedly in every survey year in order to correct any erroneous data and to record the changes in behavior over time.

Sampling Procedures

The first NLSW survey was administered in 1968. An approximate sample of 5,000, with a ratio of 3:7 for non-whites to whites, was designed as the initial cohort of NLSW to represent the U.S. civilian noninstitutionalized population who were 14 to 24 years old as of December 31, 1967. A probability sample of 5,533 was drawn by the Census Bureau, selected from a probability sample of housing units to represent every state and the District of Columbia. Of these designate women, 5,159 respondents participated in the first survey in 1968 as the initial interview sample for NLSW.

The initial participants of NLSW were the only eligible sample for all NLSW surveys as long as they were alive, residing within the United States at the interview date, noninstitutionalized, and not in the Armed Forces. When the respondents did not meet these requirements in a given survey, they were not eligible for interviews. In addition,

respondents who had refused to participate in an interview during a previous survey were dropped from the eligible sample. Moreover, beginning in 1985, some dropped respondents were reinterviewed and rejoined the eligible sample. Table 1 shows respondents' retention by race.

Table 1

Sample Characteristics by Race Composition of NLSW, 1968 and 1999

Race	Number of Interviewed Respondents		Retention (1999 as % of 1968)	Number of Deaths as of 1999
	1968	1999		
Non-black	3,700 (71.7%)	2,189 (75.5%)	59.2%	103
Black	1,459 (28.3%)	711 (24.5%)	48.7%	94

Source: Adapted from *Young Women User's Guide 2001*, p. 23.

Data Collection Procedures

The data collection for NLSW was administered by the U.S. Census Bureau. Prior to each survey period, a list of eligible samples was generated and the assigned cases were distributed to the interviewers who resided in the same geographic area as the respondents. Over the first six years from 1968 to 1973, the personal-type interviews were conducted annually and then undertaken with a 2-2-1 schedule. The 2-2-1 schedule, begun in 1975, is a biennial basis interview that replaced the previous yearly one by using two continuing telephone interviews and one personal interview.

The interview instruments included the questionnaires used in the paper-and-pencil interview (PAPI) and the laptops used in the computer-assisted personal interview (CAPI). The PAPI interview was replaced by the CAPI starting in 1995. The survey instruments were in English format, but multilingual interpreters were available by the regional offices of Census Bureau to assist the interview when there was a need.

Target Population and Sample

The target population of this study is the civilian noninstitutionalized female population of the continental United States who were 14 to 24 years old as of December 31, 1967. Because training duration variables that a respondent participated in both on-the-job training (OJT) and other training courses or educational programs other than OJT (other training) were only available after the survey year of 1980 in NLSW, this study used the data from ten consecutive surveys in the data set, the survey years of 1982, 1983, 1985, 1987, 1988, 1991, 1993, 1995, 1997, and 1999. All samples drawn from the surveys were the U.S. civilian noninstitutionalized women ranging in age from 45 to 58 as of June 30, 1999.

In order to examine job training participation among mid-career women in the United States, the sample in the surveys was further filtered for application by this study.

First, of the 5,159 respondents who participated in the initial survey of NLSW in 1968, 2,259 people were not interviewed in survey year 1999. As mentioned earlier in this chapter, the sample was ineligible when they were institutionalized, in the Armed Forces, deceased, residing outside the United States, dropped from the eligible sample for

two consecutive surveys, were impossible to locate, or resistant to being interviewed. Therefore, a total of 2,900 respondents who remained in survey year 1999 were generated as the eligible sample for this study.

Second, as defined in this study, job training is a worker's formal learning that relates to his or her current or future job. It includes courses taken at a job, courses taken somewhere else that relate to a job or a new career, or courses for a license or certification needed for a job. Based on the variables utilized in the NLSW, respondents reported the time they spent on job training in two categories: on-the-job training (OJT) and other training courses and educational programs (Other training). From the survey years 1982–1999 in the NLSW, respondents were asked in each interview about the total number of hours they spend on OJT and other training during the period between two consecutive survey years. Therefore, only respondents who completed all ten surveys (survey years 1982–1999) and had answers for interview questions on each chosen variable in the research questions for this study were selected as the sample for this study. This reduced the sample size from 2,900 to 1,091.

Among the 1,091 selected respondents, 50 were eliminated because either their answers could not be identified (e.g., refusal and don't know) or their responses were outliers. This further reduced the sample size to 1,041 for the first research question for this study, which examines factors related to respondents' participation in job training.

Finally, since hourly wage rates were added to the second research question as a dependent variable in this study, people whose answers were missing data, zero, or outliers were eliminated from the selected sample. Therefore, the final sample for the

second research question on determining the relationship between job training and wage rates was reduced from 1,041 to 838.

Variables

Dependent Variables

This section contains a description of the dependent variables used in the research questions for this study: job training participation and hourly wage rates. In research question two, job training participation in OJT and other training were used as the independent variables and are discussed in the next section.

On-the-job training (OJT). OJT is defined as training activities performed at workers' worksites during the work itself. In this study, this variable refers to whether the women spent any amount of time in OJT over their career life between 1982 and 1999. One dummy code was made for this categorical variable in this study: 0 as "zero hours", which means that a respondent did not receive OJT; and 1 as "any amount of time greater than zero hours", which means receiving OJT. The total amount of time was the sum of total hours a woman spent in OJT during the period of the ten survey years. Each respondent's total hours were summed up from the reports she responded to in the ten surveys.

Before making 0 and 1 coding, prior calculations for the total hours each respondent participated in OJT across the ten survey years was a prerequisite task. During the ten survey years, two repeated interview questions were asked in each survey and

were used as the measurement for the total hours of OJT participation in each survey year: (a) the number of weeks spent in OJT, and (b) the number of hours per week spent in OJT. People without OJT were assigned a value of zero as the number of hours in OJT. By multiplying these two variables, a total number of hours each respondent spent for OJT in each survey year were generated. Respondents' cumulative hours of OJT then were summed over the ten survey years. Some extremely skewed values were treated as outliers and eliminated from the sample (e.g., ≥ 50 hours per week in OJT).

Other training courses or educational programs (Other training). Other training is defined as training courses or educational programs other than OJT. Similar to the OJT participation, this categorical variable refers to whether or not the women received any amount of time from job training other than OJT over their career life between 1982 and 1999. The total number of hours was generated from the product of two variables in each survey: the number of weeks, and the hours per week the respondents spent in the training courses or educational programs other than OJT. People who did not spend any time in this category were coded a value of zero as their total hours of participation in training. The skewed values were excluded from the sample (e.g., ≥ 50 hours per week in other training). Women's cumulative time for other training over the period of ten-survey years was a sum total of the hours they reported in each survey. One dummy code was made: "zero hours" was coded 0, and "any amount of time greater than zero" was coded 1.

Hourly wage rates. Hourly wage rates refer to the actual hourly rate of pay in dollars each respondent received from her jobs in 1999 with the exclusion of overtime and performance pay. Women who refused to report or showed unknown answers were

treated as missing data and excluded from the sample. The skewed data were also eliminated from the sample (e.g., = 0 or >100). In order to moderate the effects of the right-side skew of actual wage distribution, this variable was transformed to be a natural logarithm of hourly wage rates in the regression models in research question two of this study.

Independent Variables

This section provides a discussion on the selected independent variables that might have influenced training participation among mid-career women in the United States.

Age cohort. The variable cohort was classified by the respondents' age category. A respondent's age was calculated as of June 30, 1999 by using the respondents' birthday information collected in the initial survey year and the corrected information on the date of birth updated during the 1995-1999 surveys. Cohort is treated as a nominal variable in this study. People aged 45 to 58 as of the year 1999 were dummy coded into 12 cohort categories: cohort 1 for "age 45", cohort 2 for "age 46", cohort 3 for "age 47", cohort 4 for "age 48", cohort 5 for "age 49", cohort 6 for "age 50", cohort 7 for "age 51", cohort 8 for "age 52", cohort 9 for "age 53", cohort 10 for "age 54", cohort 11 for "age 55", and cohort 12 for "age 56 to 58."

Race. The variable race is categorized into White and non-White. The racial composition of the initial cohort in NLSW is 3,638 Whites, 1,459 Black, and 62 others.

These groups were dummy coded into two categories: 1 for “Whites” and 0 for “non-Whites.”

Education attainment. This refers to the highest grade the respondent completed as of the year 1999. Two levels of education degrees were classified in this study: “high school graduate or less” was coded 0, and “beyond high school” was coded 1.

Marital status. This variable refers to the information about whether the respondent was married or had never married. One dummy code was used in this study: 1 for “married” or “ever married,” and 0 for “never married.”

Industry. The industry coding in the NLSW is based on the Census Bureau Alphabetical Index of Occupations and Industries (U.S. Department of Labor, 2001). This variable refers to the type of industry that women worked in 1999. One dummy code was used in this study: 1 for “manufacturing industry” and 0 for “other industries.”

Occupation. The occupation coding in the NLSW is based on the Census Bureau Alphabetical Index of Occupations and Industries (U.S. Department of Labor, 2001). In this study, two occupational types were categorized and dummy coded into: 1 for “professional, technical, and managerial” and 0 for “other occupations.”

Average work-weeks per year. This refers to the average number of weeks worked per year as reported by a respondent in all survey years in the NLSW (1968–1999). This is a created variable in survey year 1999 of the NLSW, which summarizes each year for a total number of weeks worked and calculates an average number of weeks a respondent worked from 1968 to 1999. In this study, this variable was classified into three levels as a categorical variable: 28 weeks and below, 29 to 39 weeks, and 40 weeks and above.

These three levels were in two dummies and “28 weeks and below” was set as a reference group in research questions for this study.

On-the-job training (OJT). This refers to the total hours a respondent participated in OJT from 1982 to 1999. The calculation for the total hours of training participation was the same as mentioned in the last section, a respondent’s cumulative hours for OJT were summed over the ten survey years. The total hours were grouped into four levels: 0 hours, 1 to 67 hours, 68 to 233 hours, and 234 hours and above. These four levels were in three dummies and “0 hours” was made as a reference group for this variable in research question two of this study.

Other training courses or educational programs (Other training). This categorical variable refers to the total hours a respondent participated in other training between 1982 and 1999. Hours were made into four categories “0 hours, 1 to 35 hours, 36 to 130 hours, and 131 hours and above” and were in three dummies. The first category “0 hours” was used as a reference group for this variable in research question two of this study.

Data Analysis

This section is organized according to the research questions for this study. Two data analysis techniques were used: (a) descriptive statistics (e.g., frequency distribution), and (b) multivariate analyses, which include logistic regression and multiple regression. All statistical analyses were completed using the Statistical Package for Social Scientists (SPSS).

Research Question One

Descriptive statistics and logistic regression analysis methods were used to answer research question one to determine the relationships between job training participation and demographic characteristics, education attainment, and work experience among mid-career women. Descriptive statistics are tabular and numerical summaries of the data, which are employed to obtain a number that describes a collection of events and relationship between one event and other events (Couch, 1987). The reason to use descriptive statistics in this study is to facilitate the presentation and interpretation of the NLSW data on job training participation by respondents' characteristics.

Frequency distribution, including grouped and relative frequency distribution, was used to describe how a respondent's total hours of participation in job training were distributed by her demographic characteristics, education attainment, and work experience. The total hours of OJT participation were categorized into four levels: 0 hours, 1 to 67 hours, 68 to 233 hours, and 234 hours and above. Also, the total hours of participation in other training were grouped into four levels: 0 hours, 1 to 35 hours, 36 to 130 hours, and 131 hours and above. The number of times an event (i.e., each hour category) occurred and the proportion of the total number of cases accounted for by the frequency of occurrence of each event were manipulated in research question one.

In addition, binary logistic regression was used in research question one as an inferential statistical procedure to identify the predictor variables that increase or decrease the probability of an event happening (i.e., job training participation). The logistic regression was used to model associations between a dichotomous dependent

variable (e.g., whether or not a respondent participated in job training) and categorical or continuous independent variables (Afifi, Clark, & May, 2004). Logistic regression applies maximum likelihood estimation to determine the probability of an event's occurrence between 0 and 1 based on observed values of the independent variables. Binary logistic regression is suitable for application to analysis of research question one because it allows the determination of the relationship among several independent variables for whether or not a respondent participated in job training.

To utilize this analysis technique, the dependent variable, job training participation (i.e., a respondent's total hours of participation in job training between 1982 and 1999), was classified into two groups. One group was coded 0, indicating that a respondent did not receive any kind of job training (i.e., her total training hours was zero). The other group was coded 1, meaning that a respondent has received any kind of job training (i.e., her total training hours is equal to or greater than one). Two models of participation in OJT and other training were modeled separately through binary logistic regression.

The purpose of the following two equations is to show the prediction of the probabilities that the respondents happened to participate in OJT and other training according to the associated independent variables, including age cohort, race, marital status, educational level, industry, occupation, and average work-weeks per year. Since the logistic regression model has nonlinear relationships between dependent and independent variables, a logarithmic transformation is necessary to model this nonlinearity (Menard, 2002).

$$P(OJT) = \frac{e^{b_0 + b_1 X_1 + \dots + b_k X_k}}{1 + e^{b_0 + b_1 X_1 + \dots + b_k X_k}} = \frac{\text{Exp}(b_0 + b_1 X_1 + \dots + b_k X_k)}{1 + \text{Exp}(b_0 + b_1 X_1 + \dots + b_k X_k)}$$

$$P(\text{Other Training}) = \frac{e^{b_0 + b_1 X_1 + \dots + b_k X_k}}{1 + e^{b_0 + b_1 X_1 + \dots + b_k X_k}} = \frac{\text{Exp}(b_0 + b_1 X_1 + \dots + b_k X_k)}{1 + \text{Exp}(b_0 + b_1 X_1 + \dots + b_k X_k)}$$

Logistic regression applies maximum likelihood estimation after transforming the dependent into a logit variable by taking the natural logarithm. Through an exponential manipulation of coefficients, an odds ratio, e^b , is derived to show if a specific independent variable increases or decreases the odds of the dependent variable occurring (Hosmer & Lemeshow, 1989).

In research question one, a test of log likelihood ratio was used to test the significance of the logistic model. A value of $-2 \log$ likelihood is the natural log of the maximum likelihood value multiplied by -2 , which is obtained from fitting the model (Hosmer & Lemeshow, 1989). A well-fitting model is significant at the .05 level or better ($P\text{-value} \leq .05$), which means we reject the null hypothesis that none of the independent variables are linearly related to the training participation in OJT and other training.

Research Question Two

The second research question assesses the relationships between the amount of time a respondent spent on job training between 1982 and 1999 and her wage effect in 1999. Multiple regression was used to explore the associations between job participation

and hourly wage rates. Multiple regression is used to examine simultaneously the influence of a set of factors (independent variables) on a continuous dependent variable. Moreover, it allows demonstration of the relative predictive importance of the factor variables (Urdan, 2001).

In the multiple regression model, log hourly wage rate is a dependent variable and a set of factors are independent variables. Three separate regression models were constructed to show how a respondent's hourly wage rate is related to her participation in OJT, other training, and both OJT and other training. Based on the distribution of respondents' total hours in job training, hours for OJT were grouped into four levels: 0, 1 to 67, 68 to 233, and above 233 hours. Total participation hours for other training were classified into four categories: 0, 1 to 35, 36 to 130, and above 130 hours. In addition to job training participation in each regression model, other independent variables, such as age cohort, race, marital status, education attainment, industry, occupation, and average work-weeks per year, were included in each equation model.

The *F* ratio was calculated to test the significance of the overall regression model. A model is significant at the .05 level or better ($P\text{-value} \leq .05$), where we reject the null hypothesis that all regression coefficients are zero. Finally, the significance of the regression coefficient for each given independent variable was also inspected. The detailed data analysis and findings are presented in the next chapter.

Chapter 4

Findings

This chapter interprets the findings and presents the results of this study. The purpose of this study was to explore whether mid-career women's participation in job training is related to their demographic characteristics, educational levels, and work experiences. The employment outcomes in terms of hourly wage rates associated with job training participation among women in their late careers were also investigated in the study. The findings are organized according to the research questions.

Research Question One

Q1: Is women's participation in job training, including on-the-job training (OJT) and other training courses or educational programs (Other training), significantly affected by factors such as age cohort, race, education attainment, marital status, industry, occupation, and average work-weeks per year?

Descriptive Statistics

This section presents the distribution of participation in on-the-job training (OJT participation) and other training courses or educational programs (Other training participation) by demographic and other background variables among women aged 45 to 58.

Table 2 shows the distribution of OJT participation according to number of hours accumulated from 1982 to 1999, by all independent variables. Four levels of OJT participation hours are categorized into quartiles. About 26% of women did not receive OJT, 26% spent 1 to 67 hours, 24% had 68 to 233 hours in OJT, and close to 24% participated in OJT for more than 233 hours. Nearly one quarter of whites had zero hours of OJT participation, while non-whites had a higher rate of not receiving OJT (23.8% versus 35.5%). Overall, more white women received OJT than non-whites. Women who have never been married show a higher rate of OJT participation above 233 hours than those who have ever been married (36.4% versus 22.4%).

Women with education beyond high school received more OJT than those who were high school graduates or less. Nearly 15.5% of women who had a degree beyond high school had zero hours of OJT, while close to 39% of women who were high school graduates or less did not receive OJT. More women who worked in the manufacturing industry than those in other industries did not participate in OJT (38.0% versus 24.6%). About 85% of women who were in professional, technical, or managerial occupations received OJT, while nearly 60% of women who were in other occupations participated in OJT.

Women who had shorter durations of work per year received less OJT. More than 42% of respondents who worked less than 28 weeks per year did not receive OJT. Among respondents who worked 29 to 39 weeks per year and 40 weeks and above per year, 25.4% and 19.3% did not receive OJT, respectively. Overall, women who worked more weeks per year received more OJT than those who worked fewer weeks per year.

Table 2

Regular and Percent Distribution of OJT Participation by Demographic Characteristics, Education, Work Experience for Women Aged 45 to 58 in 1999 in the United States (n = 1,041)

Characteristic	OJT participation hours				Total
	0	1 - 67	68 - 233	> 233	
<i>Demographic</i>					
Age cohort					
Cohort 1	9	7	3	6	25
	36.0%	28.0%	12.0%	24.0%	100.0%
Cohort 2	28	32	27	35	122
	23.0%	26.2%	22.1%	28.7%	100.0%
Cohort 3	21	31	30	29	111
	18.9%	27.9%	27.0%	26.1%	100.0%
Cohort 4	26	20	22	25	93
	28.0%	21.5%	23.7%	26.9%	100.0%
Cohort 5	23	28	31	25	107
	21.5%	26.2%	29.0%	23.4%	100.0%
Cohort 6	36	28	33	21	118
	30.5%	23.7%	28.0%	17.8%	100.0%
Cohort 7	24	22	29	22	97
	24.7%	22.7%	29.9%	22.7%	100.0%
Cohort 8	20	37	28	20	105
	19.0%	35.2%	26.7%	19.0%	100.0%
Cohort 9	29	13	15	17	74
	39.2%	17.6%	20.3%	23.0%	100.0%
Cohort 10	22	23	16	11	72
	30.6%	31.9%	22.2%	15.3%	100.0%
Cohort 11	24	20	8	24	76
	31.6%	26.3%	10.5%	31.6%	100.0%
Cohort 12	11	10	8	12	41
	26.8%	24.4%	19.5%	29.3%	100.0%
Race					
White	197	231	205	194	827
	23.8%	27.9%	24.8%	23.5%	100.0%
Non-White	76	40	45	53	214
	35.5%	18.7%	21.0%	24.8%	100.0%

Table 2 (Continued)

Characteristic	OJT participation hours				Total
	0	1 - 67	68 - 233	> 233	
<i>Marital status</i>					
Ever married	244 25.9%	245 26.0%	242 25.7%	211 22.4%	942 100.0%
Never married	29 29.3%	26 26.3%	8 8.1%	36 36.4%	99 100.0%
<i>Education</i>					
Beyond HS diploma	86 15.5%	150 27.0%	152 27.3%	168 30.2%	556 100.0%
HS graduate or less	187 38.6%	121 24.9%	98 20.2%	79 16.3%	485 100.0%
<i>Industry</i>					
Manufacturing	49 38.0%	26 20.2%	21 16.3%	33 25.6%	129 100.0%
Other	224 24.6%	245 26.9%	229 25.1%	214 23.5%	912 100.0%
<i>Occupation</i>					
Professional, Technical, and Managerial	68 14.7%	115 24.8%	140 30.2%	141 30.4%	464 100.0%
Other	205 35.5%	156 27.0%	110 19.1%	106 18.4%	577 100.0%
<i>Typical weeks worked per year</i>					
28 weeks and below	90 42.3%	62 29.1%	37 17.4%	24 11.3%	213 100.0%
29 to 39 weeks	96 25.4%	106 28.0%	87 23.0%	89 23.5%	378 100.0%
40 weeks and above	87 19.3%	103 22.9%	126 28.0%	134 29.8%	450 100.0%
<i>Total</i>					
Row %	26.2%	26.0%	24.0%	23.7%	100.0%

Source: National Longitudinal Surveys of Young Women Data (U.S Department of Labor, 2003).

Note. Row percentages are shown in table.

Table 3 shows the distribution of other training participation (other training courses or educational programs) by all independent variables among women at mid-career. Nearly 50% of women across all age cohorts did not receive other training. More whites than non-whites participated in other training (54.1% versus 39.7%). About 37% of women who had a degree beyond a high school diploma showed no participation in other training, compared to 62.5% of women who were high school graduates or below. Overall, women with a higher education tended to receive more training.

About 40% of women in the manufacturing industry received other training, compared to 52.7% of women in other industries. Women whose occupations were professional, technical, or managerial had a higher rate of receiving other training than those who were in other occupations (63% versus 41%).

Women who had a shorter duration of work per year received less other training. About 58% of women who worked fewer than 28 weeks per year did not receive other training compared to 50.3 % of women who worked typically 29 to 39 weeks per year and 43.6% of women who worked 40 weeks or more per year.

Table 3

Regular and Percent Distribution of Other Training Participation by Demographic Characteristics, Education, Work Experience for Women Aged 45 to 58 in 1999 in the United States (n = 1,041)

Characteristic	Other training participation hours				Total
	0	1 - 35	36 - 130	> 130	
<i>Demographic</i>					
Age cohort					
Cohort 1	17 68.0%	1 4.0%	3 12.0%	4 16.0%	25 100.0%
Cohort 2	60 49.2%	25 20.5%	13 10.7%	24 19.7%	122 100.0%
Cohort 3	58 52.3%	17 15.3%	22 19.8%	14 12.6%	111 100.0%
Cohort 4	44 47.3%	17 18.3%	18 18.3%	15 16.1%	93 100.0%
Cohort 5	44 41.1%	29 27.1%	14 13.1%	20 18.7%	107 100.0%
Cohort 6	58 49.2%	17 14.4%	17 14.4%	26 22.0%	118 100.0%
Cohort 7	49 50.5%	14 14.4%	23 23.7%	11 11.3%	97 100.0%
Cohort 8	49 46.7%	13 12.4%	24 22.9%	19 18.1%	105 100.0%
Cohort 9	40 54.1%	13 17.6%	10 13.5%	11 14.9%	74 100.0%
Cohort 10	30 41.7%	12 16.7%	18 25.0%	12 16.7%	72 100.0%
Cohort 11	38 50.0%	13 17.1%	11 14.5%	14 18.4%	76 100.0%
Cohort 12	22 53.7%	5 12.2%	9 22.0%	5 12.2%	41 100.0%
Race					
White	380 45.9%	152 18.4%	160 19.3%	135 16.3%	827 100.0%
Non-White	129 60.3%	24 11.2%	21 9.8%	40 18.7%	214 100.0%

Table 3 (Continued)

Characteristic	Other training participation hours				Total
	0	1 - 35	36 - 130	> 130	
<i>Marital status</i>					
Ever married	459 48.7%	163 17.3%	166 17.6%	154 16.3%	942 100.0%
Never married	50 50.5%	13 13.1%	15 15.2%	21 21.2%	99 100.0%
<i>Education</i>					
Beyond HS diploma	206 37.1%	110 19.8%	113 20.3%	127 22.8%	556 100.0%
HS graduate or less	303 62.5%	66 13.6%	68 14.0%	48 9.9%	485 100.0%
<i>Industry</i>					
Manufacturing	78 60.5%	17 13.2%	19 14.7%	15 11.6%	129 100.0%
Other	431 47.3%	159 17.4%	162 17.8%	160 17.5%	912 100.0%
<i>Occupation</i>					
Professional, Technical, and Managerial	171 36.9%	96 20.7%	100 21.6%	97 20.9%	464 100.0%
Other	338 58.6%	80 13.9%	81 14.0%	78 13.5%	577 100.0%
<i>Typical weeks worked per year</i>					
28 weeks and below	123 57.7%	32 15.0%	21 9.9%	37 17.4%	213 100.0%
29 to 39 weeks	190 50.3%	58 15.3%	69 18.3%	61 16.1%	378 100.0%
40 weeks and above	196 43.6%	86 19.1%	91 20.2%	77 17.1%	450 100.0%
Total					
Row %	48.9%	16.9%	17.4%	16.8%	100.0%

Source: National Longitudinal Surveys of Young Women Data (U.S Department of Labor, 2003).

Note. Row percentages are shown in table.

Logistic Regression

Table 4 presents two models that show the results of the logistic regression analysis on the likelihood of receiving job training for each independent variable. In this study, no age cohort showed a significant likelihood of receiving OJT and other training. Whites were 1.68 times and 1.69 times more likely than non-whites to receive OJT and other training, respectively. Women with education beyond high school were 2.43 times more likely than those who were high school graduates or less to receive OJT. Similarly, women with a higher education tended to have greater likelihood of receiving other training. Women with education beyond a high school diploma were 2.13 times more likely to receive other training than those with lower education.

In addition, the odds of receiving job training are related to different occupations and length of work duration. Women who are in professional, technical, or managerial occupations are more likely to receive both OJT and other training than those who are in other occupations. However, the industry factor is not significantly related to the odds of receiving any job training. There is a statistically significant positive relationship between a woman's work duration and her job training participation. Specifically, in this study, women who worked 29 to 39 weeks per year were 1.89 times more likely to receive OJT than those who worked fewer than 29 weeks per year; those who worked at least 40 weeks per year were 3.01 and 1.56 times more likely than those who worked fewer than 29 weeks per year to receive OJT and other training, respectively.

Table 4

Logistic Regression Analysis for Relationship between Receiving Any Job Training and Demographic Characteristics, Education, Work Experience for Women Age 45 to 58 in 1999 in the United States (n = 1,041)

Independent variable	% n	OJT			Other		
		M (SD)	b (SE)	Odds ratio (95% CI)	M (SD)	b (SE)	Odds ratio (95% CI)
<i>Demographic</i>							
Age cohort							
Cohort 1	2.40	0.64 (0.49)	-0.40 (0.59)	0.67 (0.21, 2.11)	0.32 (0.48)	-0.62 (0.55)	0.54 (0.18, 1.58)
Cohort 2	11.72	0.77 (0.42)	0.08 (0.44)	1.09 (0.46, 2.59)	0.51 (0.50)	-0.03 (0.38)	1.03 (0.49, 2.17)
Cohort 3	10.66	0.81 (0.39)	0.39 (0.46)	1.45 (0.60, 3.61)	0.48 (0.50)	-0.05 (0.39)	0.95 (0.45, 2.03)
Cohort 4	8.93	0.79 (0.41)	-0.26 (0.45)	0.77 (0.32, 1.88)	0.53 (0.50)	0.11 (0.40)	1.11 (0.51, 2.42)
Cohort 5	10.28	0.79 (0.41)	-0.004 (0.45)	1.00 (0.41, 2.42)	0.59 (0.49)	0.29 (0.39)	1.34 (0.63, 2.87)
Cohort 6	11.34	0.69 (0.46)	-0.51 (0.44)	0.60 (0.26, 1.41)	0.51 (0.50)	-0.03 (0.38)	0.97 (0.46, 2.05)
Cohort 7	9.32	0.75 (0.43)	-0.20 (0.45)	0.82 (0.34, 1.99)	0.49 (0.50)	-0.11 (0.40)	0.90 (0.42, 1.94)
Cohort 8	10.09	0.81 (0.39)	0.09 (0.46)	1.09 (0.44, 2.68)	0.53 (0.50)	-0.03 (0.39)	0.98 (0.46, 2.09)
Cohort 9	7.11	0.61 (0.49)	-0.99 (0.46)	0.37 (0.15, 0.92)	0.46 (0.50)	-0.30 (0.41)	0.74 (0.33, 1.67)
Cohort 10	6.92	0.69 (0.46)	-0.54 (0.47)	0.58 (0.23, 1.46)	0.58 (0.50)	0.23 (0.41)	1.26 (0.60, 2.84)
Cohort 11	7.30	0.68 (0.47)	-0.44 (0.46)	0.65 (0.26, 1.60)	0.50 (0.50)	0.01 (0.41)	1.001 (0.45, 2.25)
Cohort 12	3.94	0.73 (0.45)	<i>rc</i> ^a	<i>rc</i>	0.46 (0.50)	<i>rc</i>	<i>rc</i>
Race							
White	79.44	0.76 (0.43)	0.52** (0.19)	1.68** (1.17, 2.42)	0.54 (0.50)	0.53** (0.17)	1.69** (1.22, 2.35)
Non-White	20.56	0.64 (0.48)	<i>rc</i>	<i>rc</i>	0.40 (0.49)	<i>rc</i>	<i>rc</i>

Table 4 (Continued)

Independent variable	% <i>n</i>	OJT			Other		
		<i>M</i> (<i>SD</i>)	<i>b</i> (<i>SE</i>)	Odds ratio (95% <i>CI</i>)	<i>M</i> (<i>SD</i>)	<i>b</i> (<i>SE</i>)	Odds ratio (95% <i>CI</i>)
<i>Marital status</i>							
Ever married	90.49	0.74 (0.44)	0.25 (0.27)	1.29 (0.77, 2.17)	0.51 (0.50)	0.04 (0.23)	1.04 (0.66, 1.63)
Never married	9.51	0.71 (0.46)	<i>rc</i>	<i>rc</i>	0.49 (0.50)	<i>rc</i>	<i>rc</i>
<i>Education</i>							
Beyond HS diploma	53.41	0.85 (0.36)	0.89** (0.17)	2.43** (1.74, 3.39)	0.63 (0.48)	0.76** (0.14)	2.13** (1.61, 2.82)
HS graduate or less	46.59	0.61 (0.49)	<i>rc</i>	<i>rc</i>	0.38 (0.48)	<i>rc</i>	<i>rc</i>
<i>Industry</i>							
Manufacturing	12.39	0.62 (0.49)	-0.39 (0.22)	0.68 (0.44, 1.05)	0.40 (0.49)	-0.23 (0.21)	0.79 (0.53, 1.19)
Other	87.61	0.75 (0.43)	<i>rc</i>	<i>rc</i>	0.53 (0.50)	<i>rc</i>	<i>rc</i>
<i>Occupation</i>							
Professional, Technical, and Managerial	44.57	0.85 (0.35)	0.65** (0.18)	1.91** (1.35, 2.72)	0.63 (0.48)	0.48** (0.14)	1.62** (1.22, 2.15)
Other	55.43	0.64 (0.48)	<i>rc</i>	<i>rc</i>	0.41 (0.49)	<i>rc</i>	<i>rc</i>
<i>Typical weeks worked per year</i>							
28 weeks and below	20.46	0.58 (0.50)	<i>rc</i>	<i>rc</i>	0.42 (0.50)	<i>rc</i>	<i>rc</i>
29 to 39 weeks	36.31	0.75 (0.44)	0.64** (0.20)	1.89** (1.28, 2.79)	0.50 (0.50)	0.21 (0.19)	1.23 (0.86, 1.77)
40 weeks and above	43.23	0.81 (0.40)	1.10** (0.21)	3.01** (2.01, 4.50)	0.56 (0.50)	0.45* (0.18)	1.56* (1.09, 2.24)
Intercept			-0.65			-1.27**	
-2 log likelihood			1045.45			1335.81	
<i>df</i>			18			18	
<i>p</i>			< .001			< .001	

Source: National Longitudinal Surveys of Young Women Data (U.S. Department of Labor, 2003).

^a *rc* represents the reference category.

p* < .05; *p* < .01

Research Question Two

Q2: Does women's job training participation, including on-the-job training (OJT) and other training courses or educational programs (Other training), correlate with their hourly wage rates in 1999?

Multiple Regression

This section contains an investigation of the impact of job training participation on wage rates along with demographic and other background variables among mid-career women. Three regression models of natural log hourly wage rates are presented in Table 5. All three models are highly significant ($F = 24.08$, $df = 21$, $p < .001$; $F = 21.01$, $df = 21$, $p < .001$; $F = 21.00$, $df = 24$, $p < .001$).

The first model in Table 5 regressed OJT participation hours on log hourly wage rates. There were significant race, education, work experience, and OJT effects. However, age cohort showed no significant relationship with wage rates. White women were more likely than non-white women to have an 18% higher wage rate. Compared to women who were high school graduates or less, the wage rate for women with a degree beyond a high school diploma was 28% higher. Women who worked in the manufacturing industry tended to have an 11% higher wage rate than those who worked in other industries, and those who had a professional, technical, or managerial occupation were more likely than those who worked in other occupations to have a 29% higher wage rate.

Table 5

Multiple Regression Analysis of Demographic Characteristics, Education, Work Experience, and Job Training Participation on Natural Log Wage Rates for Women Aged 45 to 58 in 1999 in the United States (n = 838)

Independent variable	Wage rate (\$)		Proportion change in wage rate (95% CI)		
	% n	M (SD)	Equation with OJT Participation	Equation with Other Training Participation	Equation with OJT + Other Training
<i>Demographic</i>					
<i>Age cohort</i>					
Cohort 1	2.51	15.78 (7.66)	0.20 (-0.06, 0.46)	0.20 (-0.07, 0.46)	0.20 (-0.06, 0.46)
Cohort 2	12.17	16.77 9.53	0.07 (-0.12, 0.26)	0.07 (-0.12, 0.26)	0.07 (-0.12, 0.26)
Cohort 3	11.34	15.23 (7.00)	0.05 (-0.14, 0.24)	0.07 (-0.13, 0.26)	0.05 (-0.14, 0.24)
Cohort 4	8.83	17.62 (11.09)	0.09 (-0.11, 0.28)	0.09 (-0.11, 0.29)	0.09 (-0.11, 0.28)
Cohort 5	10.26	17.15 (10.06)	0.08 (-0.11, 0.27)	0.07 (-0.13, 0.26)	0.08 (-0.11, 0.27)
Cohort 6	11.58	16.17 (9.18)	0.07 (-0.12, 0.26)	0.05 (-0.15, 0.24)	0.07 (-0.12, 0.26)
Cohort 7	8.47	15.89 (9.39)	0.01 (-0.19, 0.20)	0.01 (-0.19, 0.21)	0.01 (-0.19, 0.21)
Cohort 8	10.50	15.94 (11.59)	< -0.01 (-0.19, 0.19)	-0.01 (-0.21, 0.18)	< -0.01 (-0.19, 0.19)
Cohort 9	7.28	16.52 (10.65)	< -0.01 (-0.20, 0.20)	-0.04 (-0.24, 0.17)	< 0.01 (-0.20, 0.20)
Cohort 10	6.56	15.92 9.96	0.03 (-0.17, 0.24)	< 0.01 (-0.21, 0.21)	0.03 (-0.17, 0.24)
Cohort 11	6.44	14.52 7.34	-0.01 (-0.22, 0.19)	-0.02 (-0.23, 0.19)	-0.01 (0.22, 0.19)
Cohort 12	4.06	14.48 (8.63)	<i>rc</i> ^a	<i>rc</i>	<i>rc</i>
<i>Race</i>					
White	77.09	16.95 (9.70)	0.18** (0.10, 0.26)	0.20** (0.12, 0.28)	0.18** (0.10, 0.26)
Non-White	22.91	13.43 (7.82)	<i>rc</i>	<i>rc</i>	<i>rc</i>

Table 5 (Continued)

Independent variable	% <i>n</i>	Wage rate (\$)	Proportion change in wage rate (95% CI)		
		<i>M</i> (<i>SD</i>)	Equation with OJT Participation	Equation with Other Training Participation	Equation with OJT + Other Training
<i>Marital status</i>					
Ever married	89.98	16.14 (9.47)	0.11 (-0.003, 0.22)	0.11* (0.002, 0.23)	0.11 (-0.003, 0.22)
Never married	10.02	16.16 (9.02)	<i>rc</i>	<i>rc</i>	<i>rc</i>
<i>Education</i>					
Beyond HS diploma	53.70	19.62 (10.03)	0.28** (0.21, 0.35)	0.31** (0.24, 0.39)	0.28** (0.20, 0.36)
HS graduate or less	46.30	12.11 (6.68)	<i>rc</i>	<i>rc</i>	<i>rc</i>
<i>Industry</i>					
Manufacturing	13.60	15.32 (8.96)	0.11* (0.02, 0.21)	0.10* (0.000, 0.20)	0.11* (0.01, 0.21)
Other	86.40	16.27 (9.49)	<i>rc</i>	<i>rc</i>	<i>rc</i>
<i>Occupation</i>					
Professional, Technical, and Managerial	46.54	20.43 (10.01)	0.29** (0.21, 0.36)	0.32** (0.24, 0.39)	0.29** (0.21, 0.36)
Other	53.46	12.42 (6.99)	<i>rc</i>	<i>rc</i>	<i>rc</i>
<i>Typical weeks worked per year</i>					
28 weeks and below	19.69	11.27 (7.40)	<i>rc</i>	<i>rc</i>	<i>rc</i>
29 to 39 weeks	35.32	16.22 (10.42)	0.24** (0.15, 0.34)	0.28** (0.19, 0.38)	0.24** (0.15, 0.34)
40 weeks and above	44.99	18.22 (8.58)	0.37** (0.28, 0.47)	0.43** (0.34, 0.53)	0.37** (0.28, 0.47)

Table 5 (Continued)

Independent variable	Wage rate (\$)		Proportion change in wage rate (95% CI)		
	% <i>n</i>	<i>M</i> (<i>SD</i>)	Equation with OJT Participation	Equation with Other Training Participation	Equation with OJT + Other Training
<i>OJT participation</i>					
0 hours	24.34	11.64 (7.96)	<i>rc</i>		<i>rc</i>
1 to 67 hours	25.66	14.69 (7.72)	0.13** (0.04, 0.23)		0.14** (0.04, 0.23)
68 to 233 hours	24.94	18.16 (9.02)	0.23** (0.13, 0.33)		0.23** (0.13, 0.33)
234 hours and above	25.06	20.02 (10.51)	0.32** (0.22, 0.42)		0.32** (0.22, 0.42)
<i>Other training participation</i>					
0 hours	49.16	14.47 (8.97)		<i>rc</i>	<i>rc</i>
1 to 35 hours	16.83	16.93 (8.05)		0.01 (-0.08, 0.11)	-0.01 (-0.11, 0.08)
36 to 130 hours	16.95	18.03 (8.83)		0.04 (-0.06, 0.14)	0.01 (-0.09, 0.10)
131 hours and above	17.06	18.33 (11.46)		0.04 (-0.05, 1.14)	0.01 (-0.09, 0.10)
Intercept			6.22	6.30	6.22
Adjusted R^2			.37	.33	.36
F, df			24.08, 21	21.01, 21	21.00, 24
p			< .001	< .001	< .001

Source: National Longitudinal Surveys of Young Women Data (U.S. Department of Labor, 2003).

^a *rc* represents the reference category.

* $p < .05$; ** $p < .01$

In addition, the average length of work duration for respondents per year is positively associated with their wage rates. Women who worked 29 to 39 weeks per year tended to have a 24% higher wage rate than those who worked less than 29 weeks per

year. Women who worked 40 weeks or above were more likely than those who worked less than 29 weeks per year to have a 37% higher wage rate.

The amount of time that respondents participated in OJT had a significantly positive relationship with their wage rates. Compared to women who had zero hours in OJT participation, those who had more OJT participation hours were more likely to have a higher wage rate. Women who participated in 1 to 67 hours of OJT tended to earn a 13% higher wage rate than those who did not participate in OJT at all. For those who participated in 68 to 233 hours and 234 hours and above of OJT, the increases in their wage rates were 23% and 32% respectively, compared to those who had zero hours of participation in OJT.

The second model in Table 5 regressed other training participation hours on log hourly wage rates. Similar to the first model, women who were whites, with higher education, had longer work duration per year, worked in manufacturing, and had a professional, technical, managerial occupation tended to earn a higher wage rate. Women who had ever been married were more likely than those had never been married to have an 11% higher wage rate. However, the amount of time that women participated in other training over their middle careers showed no significant relationship with their wage rates.

The third model in Table 5 regressed both OJT and other training participation on log hourly wage rates. The results were very similar to those for the first regression model. Age cohort was not significantly related to wage rates. Race, education, industry, occupation, typical work duration per year, and OJT participation were significant factors associated with respondents' wage rates. Compared to women who worked 28 weeks and

less per year, women who worked 29 to 39 weeks and worked 40 weeks and above per year were more likely to have a 24% and 37% higher wage rate, respectively.

Women who spent more training hours in OJT tended to earn a higher wage rate than those who spent fewer hours in OJT or did not participate in OJT. Specifically, women who participated 1 to 67, 68 to 233, and 234 hours and above in OJT were more likely than those who did not receive any OJT to have a higher wage rate of 14%, 23%, and 32%, respectively. However, the number of hours that women spent in other training was not significantly related to their wage rates.

Summary

The findings from this study show that participation in job training is significantly related to race, education, occupation, and typical length of work duration each year among women in mid-career. However, job training participation is not significantly associated with mid-career women's age cohort, marital status, and employment in industry.

In general, whites are more likely than non-whites to participate in both on-the-job training and other training courses or educational programs. Women with higher educational attainment or work in a professional, technical, or managerial career show a highly significant likelihood of receiving OJT and other training when compared with those who had lower education or worked in other occupational careers. In addition, the length of the duration of women's work each year is a significant factor affecting their participation in both OJT and other training. Women who typically work for longer

durations each year have greater odds of receiving job training than those who work a shorter duration each year.

Analysis of the effect of job training participation on wage rates shows that the total amount of time that mid-career women participated in OJT over their working life is positively related to their hourly wage rates. Women who spent more time on OJT were more likely to have a higher rate of pay. However, the amount of time they spent on other training courses or educational programs shows no significant relationship with their wage rates.

Also, findings from this study show that hourly wage rates are significantly related to race, education, industry, occupation, and the length of typical work duration each year among women at mid-career. Mid-career women who are whites, have higher educational attainment, work in the manufacturing industry, work in a professional, technical, or managerial occupation, and typically work more each year tend to receive a higher hourly rate of pay.

Chapter 5

Summary, Discussion, and Recommendations

This chapter is divided into three sections. The first section summarizes the research purposes, literature review, methods, and results of this study. The second section contains a discussion of the implications of findings for the two research questions in this study for the topic of this thesis. The third section is comprised of recommendations for practice and future research.

Study Summary

The purpose of this study was to identify the factors and ascertain how they relate to women's participation in job training, and to examine their wage effects on job training among mid-career women in the United States. These purposes were based on two major concerns about human capital investments and the associated outcomes for the increasing female labor force in the United States.

First, due to the significant increase in the women's labor force, women's human capital investments are important not only to individuals' labor market activities but also to the economic improvement of society. Over the past decades, the female labor force participation rate has dramatically increased from 34% in 1950 to 60% in 2002 (U.S. Department of Labor, 2004a). Also, the women's labor force was projected to grow at a faster rate than men's and share 48% of the total labor force by 2008 (U.S. Department of

Labor, 2000). With a significantly rising proportion of women in today's labor force, the female workforce is playing and will continue to play an increasingly important role in the economy and so should receive greater attention in workforce development and outcomes.

In looking at women's overall growth in labor market participation rates, it is clear that mid-career women represent the largest proportion (Fullerton, 1999). Mid-career women between the ages of 45 and 64 have consistently increased their participation in the workforce and women aged 55 and older are projected to have the highest annual growth rate among the overall civilian labor force from 2002 to 2012 (U.S. Department of Labor, 2004a). This age group is becoming a significant portion of the labor force, which in turn will have direct impacts on the social and economic status of older women in the future.

According to Becker (1993), job training and education are two fundamental aspects of human capital investment. Compared to formal schooling, job training is the major method for developing human capital among middle-aged women at work and for those who return to work. Therefore, the first research question in this study was to explore who in the middle-aged group is more likely to receive job training.

The second goal of this study was to examine the wage effects on job training participation among women at mid-career. This is based on interest in women's economic security in their late life. Among the poor elderly in the United States, 71% are women; the majority of people over age 55 who are living in poverty are unemployed women (Olson, 1990; Sandell, 1987). If job training can enable women to stay employed longer and have sufficient skills in the labor market, and if women who receive training

when returning to work in their 40s or later in life have higher wage levels than those who do not receive training, then older women should be able to avoid poverty by having more employment opportunities. Therefore, analyzing their training outcomes would be a vital task. This study's second research question was to determine if a woman's participation in job training over her working life results in any differences in her wage level.

The literature review highlighted previous research on job training participation and employment outcomes. Job training and education are two significant investments in human capital that create greater productivity and were found to have a direct impact on one's earnings (Becker, 1993, pp. 17-21; Lengermann, 1999). Training is referred to as a short-term learning intervention related to a present job; on the other hand, education is defined as intermediate-term learning to prepare for a future job.

The length of one's work life has historically been viewed as an incentive to making investments in training and education. Women who expect a shorter work life will be less likely to seek a job that requires high levels of training (Ehrenberg & Smith, 2000). Employers tend to hire and provide more training to those who have a longer work life or more work hours in exchange for greater returns on their investment. Many empirical studies show that female workers are less likely than males to receive training (Bae, 2002; Frazis, Gittleman, Horrigan, & Joyce, 1998; "Training," 1993).

Because of the dramatic growth in women's labor force participation in recent decades, many employment outcomes have drawn the attention of researchers. First, changes in wages were found to be due to job training. Human capital theory suggests that the upward-sloping earnings profiles particularly reflect investments in job training

(Becker, 1993, p. 37). This explains why workers who receive training have higher wages than those who are not trained. Many empirical studies also have demonstrated a direct relationship between job training and earnings (Lengermann, 1999; Lynch, 1992; Schochet, 1991). Training was found to exert different impacts on wage levels in different career phases. Bae (2002) found that training had a positive wage effect on women in their later careers, and Hill's (2001) study showed that women's hourly wage rates increased with training acquisition, especially with the on-the-job training received at older ages.

In this study, data were analyzed from the National Longitudinal Survey of Young Women (NLSW) (U.S. Department of Labor, 2003). The NLSW is a set of panel data governed by the Bureau of Labor Statistics (BLS). It is primarily designed to describe women's labor market activities and family background. Data in NLSW were collected from U.S. civilian noninstitutionalized women aged 14 to 24 as of December 31, 1967. The first survey in the NLSW was conducted in 1968 and the latest interview was administered in 2001.

The target population for this study was the civilian noninstitutionalized female population of the continental United States who were 14 to 24 years old as of December 31, 1967. This study used the data from ten consecutive surveys in the NLSW—the survey years of 1982, 1983, 1985, 1987, 1988, 1991, 1993, 1995, 1997, and 1999. All samples drawn from the surveys were U.S. civilian noninstitutionalized women ranging in age from 45 to 58 as of June 30, 1999. In order to examine job training participation and outcomes among mid-career women, the sample in the surveys was further filtered

from 2,900 to 1,041 for application in the first research question and reduced to 838 for the second research question of this study.

Descriptive statistics and logistic regression analysis methods were used to answer research question one to determine the relationships between job training participation and demographic characteristics, education attainment, and work experience among mid-career women. The second research question utilized the multiple regression method to assess the relationships between the amount of time a respondent spent on job training through 1982 to 1999 and her wage effect in 1999.

The findings from the first research question showed that participation in OJT and other training is significantly related to race, education, occupation, and typical length of work duration per year among women in mid-career. However, training participation was not significantly associated with mid-career women's age cohort, marital status, and industry.

Findings from analyses of data for the second research question revealed that the total amount of time that mid-career women participated in OJT over their working life was positively related to their hourly wage rates. However, participation in other training had no effect on wage rates. Mid-career women who are whites, have higher educational attainment, work in the manufacturing industry, work in a professional, technical, or managerial occupation, and typically work a longer duration per year tended to receive a higher hourly rate of pay.

Discussion

Research Question One

Is women's participation in job training, including on-the-job training (OJT) and other training courses or educational programs (Other training), significantly affected by factors such as age cohort, race, education attainment, marital status, industry, occupation, and average work-weeks per year?

Age cohort. Age cohort is not significantly related to job participation among women at mid-career. This finding is not consistent with Lin's study (Lin, 1998), which found that younger workers were more likely than older workers to spend more time on job-related training and education. Also, the results do not conform to studies that suggest that younger women receive less training (Bae, 2002; Bielby, 1992; Rosenfeld & Spenner, 1992). Moreover, other researchers found that younger workers aged 16 to 25 and older workers over the age of 45 are less likely to receive training (Carnevale, Gainer, & Villet, 1990; Shackleton, 1995).

The inconsistency with others' findings might be due to the characteristics of the sample for this study, which were mid-career women aged 45 to 58 in 1999. The cumulative time they spent on job training was summed from the total number of hours they spent over nearly two decades (1982 to 1999) at mid-life, which was not compared with other younger age cohort. Therefore, age was not found to be a significant factor affecting job training participation by this study's group.

Race. Whites were found to receive more job training than non-whites in this study. This is consistent with many previous studies, which showed that white workers are more likely to receive job training and education than people of color (Bae, 2002; Lin, 1998; Sexton & Olsen, 1994; U.S. Department of Education, 2003). As for training other than OJT, study results also conform to Hill's (2001) findings that non-white mature women tend to acquire fewer other training courses and educational programs.

Education. This study found that education has a strong significant relation to job training participation among mid-career women. Women with education beyond high school were more than twice as likely to receive OJT and other training or educational programs than those who were high school graduates or less. The same results were found in other studies on training and education (Hill, 2001; Shackleton, 1995).

People who have higher levels of educational attainment are more likely to participate in the labor force than those who have lower levels of education. According to the U.S. Department of Education (2002c), among women aged 25 and over, 73.3% of those with a bachelor's degree or higher participated in the labor force in 2001, compared with a rate of 55.8% for those who were high school graduates. Once a woman participates in labor market activities, she is more likely to receive OJT than those who engage in fewer or are without labor market activities.

Similarly, women with longer employment have a greater likelihood of engaging in other training courses or educational programs as part of career development provided by the firms in which they work. Therefore, a person's educational level relates to their labor force participation, which also significantly indicates a person's participation in job training. This finding also reveals a training trend—more educated women tend to

receive more training in their post-school years than those with lower educational attainment.

Occupation. This study found a strong positive relationship between training acquisition and occupational groups. Women who work in professional, technical, or managerial specialty occupations are more likely to receive training than those who work in other occupations, which is consistent with Hill's (1995) and Morgan's (1982) findings on women's post-school-age training.

Average work-weeks per year. The length of a woman's work duration was found to be a strong predictor of their job training. Women who had a greater number of work-weeks per year were more likely than those who had fewer average work-weeks per year to receive both OJT and other training. This finding fits with Ehrenberg's and Smith's (2000) suggestions that women who expect a shorter work life will be less likely to seek a job that requires high levels of training. The relationship between the length of women's work duration and job training participation is interdependent. On the one hand, women with more training and education were found to remain longer in the labor market (Lynch, 1992) and women who acquired more training tended to work to older ages (Hill 2001). On the other hand, employers tended to hire and provide more training to those who had a longer work life or more work hours because returns to training investment occurred during workers' subsequent periods of employment.

Research Question Two

Does women's job training participation, including on-the-job training (OJT) and other training courses or educational programs (Other training), correlate with their hourly wage rates in 1999?

This study found that the amount of time women participated in OJT over their careers has a significantly positive relationship with their hourly wage rates. Women who spend more time on OJT have a higher wage rate than those who spend less time or did not participate in OJT at all. This finding not only conforms to human capital theory but also accords with evidence found in other empirical studies.

Human capital theory suggests that the upward-sloping earnings profiles particularly reflect investments in job training (Becker, 1993, p. 37). Although job training is a broad term that might involve a variety of training forms, OJT is considered a specific measure of human capital investment and has strong association with increases in wage rates.

The positive relationship between OJT participation and wage effect found in this study also supports many conclusions in previous empirical studies (Bae, 2002; Hill, 2001; Mincer, 1993; Veum, 1995). Schochet (1990) found that the amount of time people spent on company training programs is directly related to earnings. A similar result was also found in Lynch's (1992) study, which showed that the number of weeks spent on OJT is significantly associated with wage growth. However, training participation cannot sufficiently explain training acquisition because training participation also can be

measured in different ways such as frequency, intensity, or duration (e.g., number of weeks or hours).

The significant OJT effect on wages in later careers was also consistent with the results in other studies that particularly focused on women. Bae (2002) found that training has a positive wage effect on women in their later careers, but shows no significant effect on wage growth early in a career. Hill (2001) also argued that women's hourly wage rates increase with OJT received at older ages. In this study, women's wage rates in 1999 were related positively to OJT participation calculated as total cumulative hours spent on OJT over 17 years from 1982 to 1999. Although a positive wage effect was found, this cannot be attributed to the time in the career in which OJT was received.

Recommendations for Practice

Based on study findings, several suggestions may be offered regarding better training opportunities and earnings for mid-career women that may be taken into account by policy makers, social agencies, and HRD professionals.

Race Matters

Although an ethnic minority's opportunity to participate in training on an equal basis is formally guaranteed by federal laws, race still consistently emerges as a factor in the acquisition of education and job training. As found in previous research, this study revealed that non-white working women receive less training and have a lower wage rate

than whites. Women of color are more likely than whites to depend on nonacademic training programs because they have lower rates of high school completion and college attendance (U.S. Department of Education, 2003). Therefore, in addition to redressing the educational inequalities between non-white and white women, there is a need to close the gap in post-school training acquisition for mid-career women. Regardless of the reasons for ethnic inequality, high school equivalency credentials and job skills training are particularly essential for non-white women in the United States.

Educational Attainment Matters

Of all those in the case sample in this study, nearly 54% were educated beyond having a high school diploma. Mid-career women with higher educational attainment were found to be strongly likely to receive OJT and other training and earn a higher wage. Although education and training are widely recognized as two major determinants of wage level, there is a correlation between education level and acquisition of post-school training as a result of high wage gain because more educated workers tend to receive more training and thus gain higher earnings. In other words, less educated workers acquire less post-school training and receive lower pay from work.

These findings support the need to continually promote continuing education programs and training services for mid-career women. Such promotion could occur through the U.S. government, regional agencies and local organizations. These programs should attempt to reinforce training access and minimize barriers, such as lack of information, availability/location of providers, childcare, and inflexible course delivery

for mid-career women who are seeking to enhance or develop skills. Moreover, HRD professionals need to work closely with industry and training providers to design programs that reflect the higher skills required in the workplace.

Occupational Employment Matters

The results of this study revealed that women who were employed in professional, managerial, and technical occupations were more likely than those who worked in other occupations to receive training and to earn a higher wage. The goal of training policies should be to improve women's job placements by stimulating and assisting industry in developing and improving apprenticeship and other training programs designed to provide the skilled workers for traditional high-wage jobs in high-demand labor markets.

Among the major occupational groups, professional and technical occupations are projected to be the fastest growing, at an increasing rate of 26% between 2000 and 2010 (U.S. Department of Labor, 2003a). These job groups, including computer and mathematical occupations, health care practitioners and related technical occupations, and education, training, and library occupations, require significant education and training and offer the highest wage rates. This study found that fewer than 45% of women worked in these job categories. Therefore, training programs should address and keep pace with the demands of the labor market for skilled workers and the needs of female workers for easy access to training.

Length of Work Matters

Study findings demonstrated that women's training acquisition and wage rates are associated with the length of their work duration each year over their careers. This finding supports the need to enhance women's employability and job mobility by providing adequate job training after the usual schooling age, where they may work longer and thus remain longer in the labor market.

In 2003, 25% of women worked fewer than 35 weeks and earned a median weekly wage of \$197, compared with a median weekly wage of \$609 for 45- to 54-year-old women who worked full-time and \$601 for 55- to 64-year-old women (U.S. Department of Labor, 2004d). To ensure career progress for middle-aged and older women in the labor market toward a stable and mature stage and to reduce the number of social welfare recipients, policy makers, local training facilitators, and employers should be aware of women's age disadvantage in the labor market and that this disadvantage can be addressed through training. Training policies should be made that strengthen employers' commitment to women in their middle and later life.

Recommendations for Future Research

Training Decisions and Obstacles

Future research is needed to identify the training decisions and obstacles that confront mid-career women when there is a training opportunity for them. Along with demographic background and work experience, further variables such as training

motivators, previous job training, training costs, labor force status, household income, expectancy for length of work life, and family factors may be included.

Training Programs and Sources

In addition to examining training participation and wage effects among working women, a study that further focuses on training programs, training sources (providers), training purposes, and the associated economic and non-economic returns to training would provide insightful information and thereby strengthen training policy and practice.

Training Pattern over the Life Cycle

To take advantage of NLS longitudinal data, a similar study designed to determine women's training patterns over their professional life cycle and related labor market outcomes would provide a comprehensive look at women's human capital investment.

Alternative Secondary Data

A similar study of job training participation and outcomes among middle-aged and older women using a different data set is recommended. Possible data sources include the National Longitudinal Surveys of Mature Women, National Longitudinal Surveys of Youth, 79, and National Center for Education Statistics.

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Appendix A

Approval for Use of Human Subjects in Research (IRB# 19868)

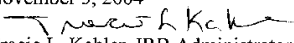
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Date: November 5, 2004
From: 
Tracie L. Kahler, IRB Administrator
To: Ying-ni Chen
Subject: Results of Review of Proposal – Exemption (IRB #19868) Secondary Data
Approval Expiration Date: November 4, 2005
"Thesis: Relationship Between Job Training Participation and Employment Outcomes Among Late Career Women in the United States"

The Office for Research Protections (ORP) has reviewed and approved your application for the use of human participants in your research. By accepting this decision, you agree to obtain prior approval from the ORP for any changes to your study. Unanticipated participant events that are encountered during the conduct of this research must be reported in a timely fashion.

If your study will extend beyond the above noted approval expiration date, the principal investigator must submit a completed Continuing Progress Report to the ORP to request renewed approval for this research.

On behalf of the ORP and the University, thank you for your efforts to conduct research in compliance with the federal regulations that have been established for the protection of human participants.

TLK/slk
cc: David L. Passmore

Please Note: The ORP encourages you to subscribe to the ORP listserv for protocol and research-related information. Send a blank email to: L-ORP-Research-L-subscribe-request@lists.psu.edu.

VITA

Ying-Ni Chen

Ying-Ni Chen is taking a four-year leave of absence from the Transworld Institute of Technology in Taiwan to engage in doctoral study at Penn State University. Before she came to Penn State, she worked at the institute for four years as a full-time lecturer in the Department of Business Administration. In addition to teaching, Ying-Ni also served as a coordinator for two years in the Office of Student Affairs, where she was in charge of student recruitment, truant consultants, and student life guidance. Before joining the Institute, she worked as an assistant manager and marketing specialist in two top 10 retail stores in Taiwan for three years.

Ying-Ni obtained her M.B.A degree from California State University at Fullerton, and a bachelor's degree in Business Administration from Azusa Pacific University, in the United States. She won several awards during her studies, including an Achievement for Outstanding Academic Excellence award, three-time appearance on the Dean's Academic List of Distinguished Students, academic honor *Magna Cum Laude*, and the Lavanda P. Muller Graduate Fellowship in Education. Ying-Ni was also a recipient of a graduate research assistantship at Penn State from 2002 to 2005.

Ying-Ni's professional experiences in both business and education include training effects and outcomes, faculty training and development, and services marketing. She has presented many papers at regional and international conferences, and has published papers in a journal and the proceedings of several conferences.