1-29-2015

Core Job Dimensions as Predictors of Intended Retirement Timing

Eric S. Ecklund
Indiana University of Pennsylvania

CORE JOB DIMENSIONS AS PREDICTORS OF INTENDED RETIREMENT TIMING

A Dissertation

Submitted to the School of Graduate Studies and Research

in Partial Fulfillment of the

Requirements for the Degree

Doctor of Philosophy

Eric S. Ecklund

Indiana University of Pennsylvania

December 2014

Indiana University of Pennsylvania
School of Graduate Studies and Research
Department of Sociology

We hereby approve the dissertation of

Eric S. Ecklund

Candidate for the degree of Doctor of Philosophy

_____ _____
J. Beth Mabry, Ph.D.
Associate Professor of Sociology, Advisor

_____ _____
John A. Anderson, Ph.D.
Professor of Sociology

_____ _____
David M. Piper, D.Ed.
Professor of Employment and Labor Relations

ACCEPTED

_____ _____
Timothy P. Mack, Ph.D.
Dean
School of Graduate Studies and Research

Title: Core Job Dimensions as Predictors of Intended Retirement Timing

Author: Eric S. Ecklund

Dissertation Chair: Dr. J. Beth Mabry

Dissertation Committee Members: Dr. John A. Anderson
Dr. David M. Piper

The impending retirement of the Baby Boomer generational cohort may have serious implications for many employers (Gursoy, Maier, & Chi, 2008; Smola & Sutton, 2002), especially in light of the impact on retirement decision-making in conjunction with the global economic crisis that began in 2007. The resultant potential changes in the U.S. labor force suggest it is important to have an improved understanding of what influences retirement timing.

This study examines possible relationships between factors that are modifiable by an organization and employees' intended retirement time. It was designed to investigate how positive job characteristics, as specified by the Job Characteristics Model (Hackman & Oldham, 1976, 1980) and measured by the Job diagnostic Survey (Hackman & Oldham, 1975) may influence the intended timing of retirement.

Using a cross-sectional methodology, I invited 9,528 employees of the Pennsylvania State System of Higher Education (PASSHE) to complete an online survey designed to collect data regarding the employees' perceived job characteristics, key demographic characteristics associated with retirement timing, projected physical health, financial health, adjustment to retirement, and the employees' intended retirement timing. A factor analysis of the job characteristics data identified two factors, meaningful engagement and job control. I used an ordinal logistic regression model to explore the possible influence of those factors on employees' intentions to retire at age ranges before, at, or after the normal retirement age range, as defined

by the Social Security Administration (2006) as ages 66 to 67 for all persons born in 1943 or later.

The analysis of the data suggests that increased levels of both the meaningful engagement and job control factors relate to an increase in the probability that an employee will intend to retire after normal retirement age and a decrease in the probability that an employee will intend to retire before normal retirement age. I conclude with a discussion of the implications of these findings for both policy and organizational practices.

ACKNOWLEDGEMENTS

There are literally more individuals who deserve to be mentioned here than there are pages in this document. The process that led to the completion of this dissertation would not have been possible for me had I to stand on my own. Instead, I was, to coin a phrase, carried on the shoulders of many giants.

To my parents, Robert and Dawn Ecklund, I owe my gratitude for instilling in me a love for learning and an insatiable curiosity, without which the long road to this point would have been dreary and without joy. Thanks to them, I was able to approach each successive challenge as yet a new opportunity to learn.

To my wife, Charlotte, and my daughters Lauren and Anna, I owe a debt I can never repay for their unflagging support, the burdens they shouldered while I was, too frequently, lost in the literature or delving into my data, and all of the time together that was preempted by this process. It is fair to say that they are likely more relieved to have reached this point than I am, and I hope that I can now dedicate far more of my attention to being the husband and father they so richly deserve. As our family also includes numerous members of the furry set, I would be remiss if I did not vow to also resume my walking, feeding, playing, and petting duties full time, as they clearly expect. I know my dear golden girl, Cassie, will be greatly relieved when I don't stay up quite so late quite so often.

To my colleagues and students, both past and present, I am indebted for their continuous support, encouragement, and genuine interest in what I was doing. I have been incredibly fortunate to have had the opportunity to work with so many wonderful people and to have so many fantastic students in my classes over the years. Even as I changed jobs half way through this process, I continued to receive messages of love and support from colleagues and students at

my previous institution even as my new Saint Francis family offered their aid and support from the very moment I first set foot on campus. I am especially thrilled to be reaching the completion of my educational endeavors nearly in synch with many students whose arrival at Saint Francis coincided with mine.

To my fellow members of Cohort X of the Administration and Leadership Studies (ALS) Ph.D. program at IUP, I give my thanks for all of the mutual support and encouragement we've enjoyed during our time together. As the faculty will certainly attest, you are, indeed, a special group of incredibly talented individuals. I am especially thankful to Dr. Hilary Staples, Dr. Jackie Wilson, Dr. Wanda Minnick, and Dr. Becky Zukowski, for their precious friendship and for blazing the path before me. Words cannot do justice in describing how dear you are to me.

To the faculty of the ALS program, you have, of course, my deepest gratitude for all that I've learned from you as well as my admiration. Above and beyond the vast breadth and depth of knowledge you each shared, you also served as ideal exemplars of what a teacher can, and should, be. I will benefit from both your knowledge and your example for the rest of my life.

To those three very special faculty members who were gracious enough to agree to serve as my committee, I owe more than I can adequately express. Dr. Beth Mabry is, without a doubt, the ideal Chairperson. Her tireless efforts along the way offered me just what I needed just when I needed it; whether it was a supportive ear, a gentle nudge, an emphatic push, or a critical eye that guided me as I revised and refined and revised again. Dr, John Anderson came to my aid in my hour of need and agreed to join my committee in spite of his already overwhelming (to anyone else) responsibilities. His analytical acumen, and patient approach to teaching, gave me a much deeper appreciation for statistics and helped me master the sophisticated techniques called for by my data. Last, but in no way least, Dr. David Piper transitioned from teaching the most

interesting, innovative, and inherently practical course I have ever had to becoming my touchstone for considering the practical applications of my findings to those actually in the workforce. I asked him to join my committee in the hopes that he would keep my research grounded, and he never failed to guide my attention back to the real-world implications suggested by my analysis. Without hesitation or equivocation I can say I could not have asked for a better committee.

There are so many other wonderful people to whom I owe thanks that I despair at my inability to recognize them all by name. Whether family, friends, acquaintances, or absolute strangers, it seems that anyone who was aware of my endeavor took the time to offer their help, their prayers, and their wishes for my continued success. While the pursuit of a doctorate is accompanied by alternating periods of euphoria and dysphoria, the one emotion I never experienced was that of feeling alone. During both the highs and the lows, the support of so many kind and thoughtful people lifted me up and sustained me and gave me the strength to persevere. Truly I am blessed.

TABLE OF CONTENTS

Chapter Page

Chapter Page

LIST OF TABLES

Table Page

Table Page

LIST OF FIGURES

CHAPTER ONE

INTRODUCTION

Retirement research frequently cites the dramatic and ongoing demographic changes in the domestic workforce (Adams & Beehr, 2003) as forces that have the potential to modify the social institution of retirement and the behavior of older workers. Those demographic changes also present serious challenges to the Social Security Administration's Old Age and Survivor's Insurance (OASI) program (Social Security Administration, 2009a). Existing and proposed modifications to the OASI program (Burkhauser & Quinn, 1997; Diamond & Orszag, 2005; Kotlikoff, 1996a, 1996b; United States Government Accountability Office, 2007), in turn, also have the potential to significantly change retirement trends in the United States. Even more recently, attention has turned to the impact of the recent recession on retirement behaviors (Ekerdt, 2010; Garr, 2009). In light of these forces, and others, it is clear that "the present regime of retirement is under revision" (Ekerdt, 2010, p. 69). As these forces and the revision of retirement they have engendered have implications for the ability of organizations to attract and retain older workers, a richer understanding of the relationship between how workers perceive their jobs and their planned retirement timing may suggest strategies that could potentially benefit both organizations and older individuals.

This chapter begins with a brief summary of the current background environmental factors that have brought increased attention to the subject of retirement decision-making. A more comprehensive discussion of those factors may be found in the second chapter. The current chapter will also present the problem statement and purpose and objectives of this study, followed by a brief introduction to the research question and hypotheses, which will also be covered in more detail in the second chapter. The current chapter concludes with a discussion of

the study's significance, assumptions and definition of terms, limitations and delimitations, and a statement of the researcher's positionality and standpoint.

Background Issues

2011 was the first year the oldest members of the Baby Boomer cohort were able to retire with full Social Security benefits (Ekerdt, 2010). With the large size of this cohort, estimated at approximately 78 million (Schaeffer, as cited in Smola & Sutton, 2002), the U.S. labor force is expected to experience a large increase in workers of retirement age or older by 2016 (U.S. Bureau of Labor Statistics, 2008) along with a relative decrease in the number of younger workers. Several researchers have suggested that the retirement of the Baby Boomers may have serious implications for many employers (Gursoy et al., 2008; Smola & Sutton, 2002).

The impending retirement of the Baby Boomer cohort, and relatively smaller size of the younger cohorts (e.g., Generation X) also have implications for the Social Security Administration's Old Age and Survivor's Insurance (OASI) program. As the OASI trust fund uses contributions from current employees and employers to provide funds for current beneficiaries (Ozawa, 2009), projections suggest the imbalance between the large number of new beneficiaries and remaining workers may result in a depletion of the trust fund by 2037 (Social Security Administration, 2009a). In addition to raising the age of eligibility for benefits already enacted (Social Security Administration Office of Retirement and Disability Policy, 2010) plans to address this issue include privatization, which would replace the OASI program with private investment plans similar to Individual Retirement Accounts (IRAs) (Kotlikoff, 1996a, 1996b), modifications of the existing program that would increase contributions while decreasing benefits (Diamond & Orszag, 2005), and proposals that means-testing be implemented to prevent the payment of Social Security benefits to those who are wealthy enough to not need them

(Quadagno, 1996). As I will be discuss in greater detail in the second chapter, all three options have the potential to encourage older workers to retire earlier than they would otherwise. Other suggestions include raising the age for early retirement and modifying the OASI program in other ways to encourage continued work at and beyond current retirement age (Burkhauser & Quinn, 1997).

The global economic crisis that began in 2007 also appears to have had an influence on retirement, with a noted net increase during the first year of the recession in labor force participation rates for workers aged 55 and older coupled with a decrease in participation rates for younger workers, likely due to increased unemployment (Garr, 2009). The crisis may have also changed employees perceptions of the risks involved in the retirement decision (Ekerdt, 2010).

Problem Statement

The ongoing demographic changes in the United States labor force and the associated challenges facing the OASI program, combined with the economic crisis of the recent recession, highlight the importance of working toward an improved understanding of retirement decision making; specifically the timing of that decision. While there are many elements of this topic deserving of continued research, the problem this research sought to address focuses on the role organizations may play in influencing the timing of retirement. The contextual factors discussed to this point suggest that organizations will increasingly need to find ways to retain and attract older workers. Not only will this be necessary in order to meet organizational human resource needs, several scholars have suggested that it also may be an important piece of the national strategy for dealing with the impending retirement of the Baby Boomer cohort. According to Shultz and Henkens (2010) “extending people’s working life is generally seen as a key element

in dampening or curtailing the rising costs associated with an ageing population" (2010, p. 265). Greller and Simpson (1999) noted that while much research has been dedicated to exploring the impact of various policies "to address the looming Social Security problem, the more direct question of how careers can be extended is still relatively unexplored in the US" (1999, p. 310). They additionally noted a relative lack of research investigating the "psychological and sociological dynamics associated with late career" (1999, p. 310). Shultz and Henkens (2010) proposed that employers play an important role in both enabling retirement and continued employment for older workers. They concluded that any attempts to modify retirement behavior through policy changes is likely to be largely dependent on the "actions and attitudes" (2010, p. 266) of organizations. This suggests that organizational "actions and attitudes" may represent important variables that have influence on the impact of any shifts in policy regarding retirement. Thus the problem facing organizations, and the focus for this research, is possible ways in which organizations may make modifications that encourage employees to extend their careers by postponing the timing of their retirement.

Purpose and Objectives of the Study

The purpose of this study was to examine the possible relationship between factors that are modifiable by an organization and the expected timing of employees' retirement decision. While there are many possible factors under the control of organizations, this study focused on job design/job enrichment variables as proposed by the Job Characteristics Model (Hackman & Oldham, 1976, 1980). Specifically, this study investigated how the job characteristics of the Job Characteristics Model (JCM), as assessed by the Job Diagnostics Survey (JDS), may influence the timing of employees' retirement decision.

Research Questions and Hypotheses

In brief, the research question for this study was: to what extent do the core job dimension variables of the JCM (Hackman & Oldham, 1976, 1980) explain variance in employees' intended retirement timing relative to the normal retirement age (Social Security Administration, 2006) as defined by the Social Security Administration? The core job dimension variables, as proposed and defined in the JCM, are: skill variety, task identity, task significance, autonomy, and feedback. The Job Diagnostic Survey (JDS) instrument developed by Hackman and Oldham (1975) was used to collect respondents' perceptions of the extent to which these variables are present in their jobs. The JCM (Hackman & Oldham, 1976, 1980; Lussier, 2012) suggests that the core job dimensions contribute to critical psychological states (experienced meaningfulness of work, responsibility for work, and knowledge of results), which in turn lead to positive personal and work outcomes (internal work motivation, effective performance, high work satisfaction, and low absenteeism and turnover). This study examined the possibility that the job dimensions might also be related to changes in intended retirement timing.

As originally formulated (Hackman & Oldham, 1976, 1980), the JCM proposes that the Motivating Potential Score (MPS) for a given job may be calculated by averaging the values for the skill variety, task identify, and task significance variables and multiplying that result by the respective values for the autonomy and feedback variables. However, research (Fried & Ferris, 1987) has indicated that a simple summed total of the five core job dimension variables may be a better indicator of the impact of those dimensions on the outcomes predicted by the JCM. Other scholars further suggested (Dunham, 1976; Fried & Ferris, 1987) that the five-factor solution for the job characteristics identified by the JDS may not hold true for every population. As a result, this study included a factor analysis of the JDS, and employed the resulting factors for this

sample as the key independent variables of interest in place of the five job characteristics defined by the JCM. The factor analysis suggested that the five factor solution did not hold true for the study sample, indicating, instead, that a two-factor solution was a better fit for the data collected. Therefore the resulting two job characteristic factors were analyzed separately for their relationship to the dependent variable (intended retirement timing) and I used neither the simple summed nor the original form of the MPS calculation.

The general research hypothesis is that as the levels of the identified (positive) job characteristic factors increase, the probability of intending to retire early, before the normal age range, will decrease. For this study, the age range of 66 to 67 represents normal retirement age, as 66 was the age of eligibility for retirement with full Social Security benefits for those born between 1943 and 1954, after which the age of eligibility gradually increased to 67, which applies to everyone born since 1960 (Social Security Administration, 2006). I also hypothesize that as the job characteristics factors increase, the probability of intending to retire late (after the normal retirement age range) will increase. However, as I employed the more conservative two-tailed test in my analysis, I chose to state my hypotheses in a direction-neutral form. Thus, the two research hypotheses for this study are:

H1: A change in the level of (positive) job characteristic factors identified from the JDS will correlate with a change in the probability of intending to retire *earlier than the normal retirement age range*, as defined by the Social Security Administration (2006) as ages 66 to 67.

H2: A change in the level of (positive) job characteristic factors identified from the JDS will correlate with a change in the probability of intending to retire *later than the normal retirement age range*, as defined by the Social Security Administration (2006) as ages 66 to 67.

Following the discussion of the factor analysis of the JDS in Chapter 4, I expand these hypotheses and address each identified factor individually.

Significance of the Study

This study may indicate potential job design/job enrichment interventions organizations could implement that should influence employees to forgo early retirement and, potentially, even work past normal retirement age. Employers are, as noted earlier, likely to face a dearth of younger workers due to demographic changes and may need to increasingly improve their ability to retain and/or attract older workers. Informing organizational efforts in this area may be of some value at the macro level of society, based on the assertion by Shultz and Henkens (2010) that "extending people's working life is generally seen as a key element in dampening or curtailing the rising costs associated with an ageing population" (p. 265).

Assumptions and Definitions of Terms

There are several key assumptions under which this research project was conducted. I explore and expand on these within the literature review chapter. However, a few of the more basic assumptions are presented as follows:

1. Decisions regarding the timing of retirement are not fully constrained and many, if not most, employees do have some agency in choosing when to retire.
2. Employees' intentions regarding the timing of retirement are significantly correlated with their actual behavior. I present direct support for this assumption within the Chapter 3.
3. Among other factors, the characteristics of the employees' jobs influence their decision regarding the timing of their eventual retirement. To be more specific, it

is the employees' perceptions of those job characteristics, rather than some external objective measure, that creates the influence on their decisions.

4. The Job Diagnostics Survey, as a measure of the elements of the Job Characteristics Model (Hackman & Oldham, 1976, 1980), captures employees' perceptions of some of those job characteristics that may influence the decision regarding the timing of eventual retirement.

I present many operational definitions within the methodology chapter. However, there are a few key terms that can and should be defined at this point, as follows:

1. Normal Retirement Age (NRA) range:

   The age defined by the Social Security Act (as amended, 1983) at which full retirement benefits may be received by the retiree. The current NRA is between 66 and 67 depending on the birth year of the employee for those born since 1943 (Social Security Administration, 2006). Employees may retire as early as 62 with reduced benefits. Recent changes in the law allow for employees to defer retirement without loss of benefits, but at no significant increase in benefits.

2. Job Characteristics Model (JCM):

   A model that suggests that job characteristics (including skill variety, task identity, task significance, autonomy, and feedback) contribute to critical psychological states (including experienced meaningfulness of work, responsibility for work, and knowledge of results), which in turn lead to positive personal and work outcomes (including internal work motivation, effective performance, high work satisfaction, and low absenteeism and turnover) (Hackman & Oldham, 1976, 1980; Lussier, 2012).

3. Job Diagnostics Survey (JDS):

   An instrument designed by the developers of the Job Characteristics Model (Hackman & Oldham, 1976, 1980) to assess, in part, the levels of the job characteristics specified in the JCM.

4. Motivating Potential Score (MPS):

   As stated by Hackman and Oldham (Hackman & Oldham, 1976):

   > According to the job characteristics model, the overall potential of a job to prompt internal work motivation on the part of job incumbents should be highest when all of the following are true: (a) the job is high on at least one (and hopefully more) of the three job dimensions that lead to experienced meaningfulness, (b) the job is high on autonomy, and (c) the job is high on feedback. The Motivating Potential Score (MPS) is a measure of the degree to which the above conditions are met. MPS is computed by combining the scores of jobs on the five dimensions. (1976, p. 258)

The full Job Characteristics Model (Hackman & Oldham, 1976, 1980) is presented in Chapter 2. Factor analysis of the Job Diagnostic Survey (JDS) indicated the five-factor solution and, thus, both the original MPS calculation and the simple summed total calculation (Fried & Ferris, 1987) were invalid for this study's sample. However, for the sake of context, I discuss the five core job dimensions described by the Job Characteristics Model, along with both methods for combining those dimensions and calculating the Motivating Potential Score in both the literature review and methods chapters. It should be noted at this point that the original MPS calculation weights the core job dimensions of autonomy and feedback more heavily than it does

the core job dimensions of skill variety, task identity, and task significance, which combine into an average score. Hackman and Oldham (1976) explained this in terms of the respective core job dimensions' influence on the critical psychological states of experienced meaningfulness of work, responsibility for work, and knowledge of results:

> Experienced Meaningfulness of the Work is enhanced primarily by three of the Core Dimensions: Skill Variety, Task Identity, and Task Significance. Experienced Responsibility for Work Outcomes is increased when a job has high Autonomy. Knowledge of Results is increased when a job is high on Feedback. (Hackman & Oldham, 1976, p. 8)

Limitations and Delimitations

The primary delimitation of this study is the decision to focus on the role, if any, played by job characteristics in influencing the planned timing of the retirement decision. As will become clear in the next chapter, the retirement literature offers a plethora of perspectives and potential independent variables through which to explore the variance in the timing of retirement. The decision to center this investigation on job characteristics inherently tends to direct focus away from other areas of investigation that have, historically, added much to our understanding of retirement. Additionally, decisions regarding the choice of a model of retirement through which to identify theoretically sound intervening and control variables, and decisions as to which of those variables to actually measure in this study, further delimit the scope of the research. Those choices will also be discussed in the next chapter.

The choices made regarding the methodological design of the proposed study, as I discuss in the third chapter, impose certain limitations on the research. For instance, the decision to employ a cross-sectional survey design severely limits the potential to establish causal

relationships with any confidence (Babbie, 2008). The chosen sample, Pennsylvania State System of Higher Education (PASSHE) universities, while well-suited in many ways to the purposes and intent of the research, inherently presents significant limits to the generalizability of any findings to organizations in general, though those findings may still be of value in informing future research with more representative sample frameworks.

Positionality and Standpoint

I believe individuals have a right to their retirement but also believe that many who retire still have much to contribute and that organizations could do more to make continuing to work an option for older employees. I am biased against retirement as a personal choice as I cannot see myself not working. I personally believe that individuals frequently get much of their self-worth from their work and that many suffer a decrease in their sense of self-worth in retirement.

I guarded against my biases by assuming that they may have an effect on all facets of my research. I continuously referred to the literature looking for confirmation and contradiction of my theoretical frameworks, methods, analysis, and interpretations. By looking for both support and contrary positions I hoped to minimize the impact of my personal preconceived notions on the research. I also depended heavily on my dissertation committee and peers to call me to account for any positions that were not supported or were contradicted by the existing literature. Finally, I clearly stated when the research design decisions and interpretations were not clearly derived from existing work and made full disclosure of the reasoning underlying those decisions and interpretations so that any possible bias that has been allowed to slip through may be identified and judged by the readers.

I would also like to mention that I take to heart the caution by Ekerdt (2010) that “we should take care not to freight late careers and retirement with expectations, policy designs, and

regimes of behavior at which too many people by temperament have small chance of success" (p. 79). I believe that the objective of this research is focused on potential interventions by organizations that continue to recognize the agency of individuals in making their decisions regarding the timing of their retirement and the agency of organizations in choosing how to design or enrich jobs.

CHAPTER TWO

REVIEW OF LITERATURE

Chapter Overview

This chapter begins with a brief discussion of the evolution of retirement as a social construct in the United States, an examination of the current environmental context, and an overview of the current state of practice for the retirement construct. That overview is followed by a discussion of the Job Characteristics Model (Hackman & Oldham, 1976, 1980) and related research as a preface to a discussion of the current body of retirement literature, with a specific focus on the relationship of various job characteristics variables to the timing of the retirement decision. An analysis of the current environmental context and state of retirement literature as presented in this chapter supports the warrant for this study. Based on that analysis, the significance of the research is discussed at the conclusion of the chapter along with a discussion of the conceptual frameworks for the study.

Historical Background

Demographically, the half century prior to the passage of the Social Security Act in 1935 saw rapid increases in the percentage of the population aged 65 and over (Abramovitz, 1996). At the same time, overall improvements in longevity were associated with an increase in the number of years a retired worker could expect to live after retiring from one and one-half to three years. As Abramovitz notes, these older workers and retirees were simultaneously experiencing a drastic decrease or outright elimination of their financial resources in part due to a significant increase in unemployment. Interestingly, the situation today closely corresponds to the state of affairs during the decades preceding the passage of the Social Security Act. The percentage of the population aged 65 and over is increasing rapidly (U.S. Bureau of Labor Statistics, 2008), life

expectancy has continued to improve (Xu, Kochanek, Murphy, & Tejada-Vera, 2010), and an economic crisis has led to a significant increase in general unemployment levels, although the participation rates for older workers have increased as a result (Garr, 2009). In terms of life expectancy, statistics suggest that an individual who was 65 in 2007 could expect to live, on average, to over 83 years of age (Xu et al., 2010, p. 8). These factors suggest that an extension of working life through delaying retirement may be necessary.

The increasing industrialization of the United States in the 50 years preceding the Social Security Act was a major economic force in decreasing employment among older workers (Abramovitz, 1996). Mechanization led employers to devalue older workers and their knowledge over younger workers who were perceived as faster and more dexterous (Abramovitz; Atchley, 1982). According to Abramovitz, increasing difficulty in finding and maintaining employment coupled with low wages and little, if any, savings led to a dependence on family and friends for support for many older workers upon retirement. However, the economic impact of the 1929 crash and the start of the Great Depression greatly decreased the ability of most Americans to care for their elderly dependents. As a result, Abramovitz reported that some cities saw increases of elderly poorhouse residents of almost 75 percent in the four years following the crash. Some estimates place the percentage of elderly Americans without sufficient income to support themselves at over 50 percent by 1934 (Social Security Administration, 2003).

Retirement and the financial security of retired individuals continued to be an important issue even after the Great Depression as retirement continued to evolve as a social institution (Atchley, 1982). According to Atchley (1982), “Social Security is much more a product of retirement than a cause of it” (p. 271). While the labor shortages of the Second World War drew many older workers back to the workplace, the period from the end of the war through the mid-

1960s was a time of growing acceptance by society of retirement as a socially acceptable and desirable phase of life. In addition to expansions of the Social Security Act, the two decades following the war also saw considerable growth in the establishment of private pension plans under the urging of the labor unions. As an indication of how important the issue of financial security for retirement became, Atchley cited the fact that unions preferentially sought increased pension benefits over increased wages during the recession of 1948-1949.

During the second half of the 20th century political activism among older Americans increased greatly (Atchley, 1982; Costa, 1998) resulting in improvements to both private pension plans and Social Security in order to secure the financial resources necessary for retirement. The increasing acceptance and activism concerning retirement seems to suggest that it is a topic of great importance in American society and that people, especially those who are older, are willing to fight to protect it as an institution. As Atchley put it, "people had learned to want retirement and to be willing to bear economic sacrifices in order to have it" (1982, p. 273).

Prior to the institutionalization of retirement and the establishment of public and private pension programs, aging workers dealt with their situation in a number of different ways. As mentioned previously, many individuals who left the workforce due to age depended on family, usually their children, or friends for support (Abramovitz, 1996) and some who had no support network ended up dependent on social welfare institutions like the poorhouses. Fischer (as cited in Atchley, 1982) gave an example of this type of family supported retirement in a description of the generally accepted practice in colonial America of landowners over age 60 signing over their land to their sons in exchange for a guarantee of support over their remaining years.

Ransom and Sutch (1986) suggested that "on-the-job retirement" (p. 2) was an option for many workers for whom full retirement was either impossible or undesirable. They explain that

older workers would change jobs within their existing organizations to one that was less demanding, thus maintaining at least a minimal level of income. However, Ransom and Sutch disagreed with the idea that retirement as a social institution is strictly a concept of the 20th century. They hypothesize that even in the 19th century industrial workers may have planned for old age and reduced income by accumulating private savings when younger to prepare for the form of retirement they describe.

The late 19th century saw the gradual development of pension programs by private organizations (Atchley, 1982). While this would seem to reflect a growing acceptance of retirement as a social institution, Atchley suggested that it was intended as a mechanism to reduce the ability of workers to move from job to job since the pensions typically required a certain number of years of service. Additionally, by setting mandatory retirement ages as part of their pension plans, organizations were able to blunt the attempt by unions to establish seniority as the primary evaluative factor in employee decisions. However, Szinovacz (2003) referred to these private pension programs and the eventual creation of state-funded support programs as "crucial for the development of retirement as an institution" (p. 8).

Organizations have a long history of deriving benefits from the departure of older workers from the workforce. During the industrial revolution (Macnicol, 2006), older workers were forced out so they could be replaced with younger workers, who were perceived as better equipped to handle the increased pace of production. Macnicol (2006) cited the work of Devine, who "observed that employers were allowed to 'scrap' their older workers much in the same way that they 'scrapped' outmoded machinery" (p. 212). While the early efforts towards a social security system were intended to address the plight of such workers, the original form of the Social Security Act, passed during the Great Depression, "was in part an attempt to remove older

workers from industry and re-distribute their jobs to the young unemployed" (2006, p. 214). Franck (2002) noted that in the modern era employers seek the financial benefits associated with terminating higher paid older workers, and are able to do so in spite of the Age Discrimination in Employment Act because:

> Federal courts are increasingly willing to hold that employers do not violate the ADEA by terminating older workers based on their higher earnings. Specifically, courts have upheld employer decisions to terminate or lay off older workers because of their higher salaries and their impact on the profitability of the company. (p. 1410)

While being displaced from one's job, even for an older worker, does not appear to necessarily imply retirement, there are other forces driving older workers to enter retirement. As reported by Quadagno (2011), the ADEA also offers little practical protection against hiring discrimination, due to the difficulty in establishing that decisions not to hire were based on age. Quadagno also described research that indicated older workers, when compared to younger displaced workers, were less likely to find new work and more likely to give up searching for a job and instead enter retirement. Thus it appears clear that organizations, in pursuing their financial interests, may contribute to the movement of older workers from the workforce into the ranks of the retired.

Clearly the social construct of retirement has a long history in the United States. In some ways, the institution of retirement worked to the benefit of older workers who could no longer work either due to health issues or because they were forced out by ageist attitudes or the financial interests of employers. However, in other ways the institution of retirement was used to manipulate and control older workers and/or labor. As noted by Piven and Cloward (1993), even the Social Security Act, in its initial form, left many disadvantaged workers uncovered, including

lowly paid agricultural workers and domestic workers, to the extent that only about half of all workers were actually in a position to benefit (Quadagno, 1984). Additionally, since "eligibility was made conditional on a history of steady employment" (Piven & Cloward, 1993, p. 445), employees who became disabled were in danger of losing their benefits, at least until the creation of the Disability Insurance (DI) program with the passage of the 1954 amendment to the Social Security Act (Social Security Administration, 2003), which excluded periods of disability from the income record of a worker so afflicted. Even then, workers who experienced extensive periods of unemployment, which would not be uncommon for the poorest and most disadvantaged, could find themselves ineligible.

What is most relevant to this study, however, is that, as Ekerdt (2010) noted, "retirement is perennially becoming something else" (p. 69). The increase in life expectancy, the changes in the economic health of the U.S., and the transition from a manufacturing based economy to one that is more service and knowledge based, along with many other factors, would seem to indicate significant forces for change in the retirement construct. Ekerdt also noted that, while one role of retirement is to allow workers to stop working as they age, that "it is less clear whether this is a developmental need or a response to cultural suggestion" (2010, p. 69). One objective of this study is to potentially provide organizations with the means to modify jobs in preparation for what appears to be an impending change in the way societal pressures influence the behaviors of older workers.

Current Environmental Context

Ekerdt (2010) noted that 2011 marks the first year in which the oldest members of the Baby Boomer cohort are able to apply for full retirement benefits. That cohort, generally defined as those born between 1943 and 1960 (Zemke, Raines, & Filipczak, 1999) represents the largest

American generation to date (Cowell & Kupritz, 2007). Schaeffer (as cited in Smola & Sutton, 2002) estimated that the Baby Boomer cohort is made up of approximately 78 million individuals. By 2016, the number of potential workers in the United States labor force in the age groups 65 to 74 and 75 and up are both expected to increase by over 80 percent (U.S. Bureau of Labor Statistics, 2008). The impending retirement of such a large portion of the current workforce (Gursoy et al., 2008; Smola & Sutton, 2002) has serious potential implications for organizations across many industries. This issue is compounded by the fact that there is a concomitant relative decrease in the number of younger workers, due to the fact that the generational cohorts that followed the Baby Boomers are not larger than the older cohort, as has historically been the case. Generation X, typically defined as those born between 1960 and 1980 (Zemke et al., 1999), currently represents the majority of the workforce that isn't part of the Baby Boomer cohort (Gursoy et al., 2008; Smola & Sutton, 2002). Schaeffer (as cited in Smola & Sutton, 2002) estimated the size of the Generation X cohort at 45 million individuals. However, according to my calculations, that estimate appears to be based solely on the number of births between 1960 and 1980 (U.S. Census Bureau, 2012). Using the most recent data (U.S. Census Bureau, 2014) my calculations suggest that the 2013 total current adult civilian population born between 1960 and 1980 was approximately 86.7 million and consisted of nearly 10 million non-citizens, and approximately 69.2 million native born and 7.6 million naturalized citizens. Using the same data, I found that almost 17 million of the individuals in this cohort (regardless of citizenship) are recorded as non-workers, which leaves approximately 69.7 million Generation X workers.

Doeringer and Terkla (1990) noted that some organizations are more likely to encounter workforce problems due to the aging of the Baby Boomer cohort and the relatively small size of

the younger cohorts due to the variance in the proportional makeup of the employee base across industries. According to their analysis the threat comes in two forms. In some sectors the older generational cohort makes up a large percentage of the existing workforce (relative to the national average). Doeringer and Terkla described organizations in these sectors as being subjected to a "retirement bulge" (1990, p. 148). As the Baby Boomers begin to retire, organizations affected by the retirement bulge will lose significant percentages of their labor force. Other sectors "are facing a 'youth squeeze' because they depend heavily on a contracting supply of younger workers" (1990, p. 148). According to their analysis of U.S. Census data from 1987, Doeringer and Terkla concluded that the general trend is for organizations in the manufacturing sectors to be primarily impacted by the retirement bulge while the service sectors are particularly susceptible to the youth squeeze effect. An excerpt of their findings is presented below in Table 1. My calculations, using the most recent data (U.S. Bureau of Labor Statistics, 2014) and the 13 industry classifications defined by the census, suggests that, for all industries, the current workforce consists of 21.9% workers 55 and older and 12.6% workers 24 or younger. Table 2 shows those industry classifications that could currently be considered subject to a retirement bulge or youth squeeze as their labor force composition is currently above the respective averages for the two age groups. The implication, assuming this trend continues, is that the impending retirement of the Baby Boomer cohort may have a significant impact on over half (53.8%) of the census-defined industries due to the difficulty in replacing lost human resources, unless some way can be found to increase retention of those workers.

Table 1

Retirement Bulge/Youth Squeeze Industries (1990)

Top 5 retirement bulge industries	% of work force aged >= 55	Top 5 youth squeeze industries	% of work force aged <=24
Household services	26.8	Entertainment and recreation	38.8
Leather	23.0	Retail	38.5
Petroleum	22.7	Household services	35.3
Aircraft manufacturing	19.2	Repair services	22.2
Primary metals/ Insurance and real estate (*tie)*	16.5	Furniture and fixtures	22.0

Note: Author created table adapted from data in Doeringer and Terkla (1990, p. 149).

Table 2

Industries With % of Workers 55 and Older or 24 and Younger in Excess of Averages for all Industries (2014)

Top retirement bulge industries	% of work force aged >= 55	Top youth squeeze industries	% of work force aged <=24
Agriculture, forestry, fishing, and hunting	34.8	Leisure and hospitality	34.1
Transportation and utilities			
Other services (*tie*)	24.7	Wholesale and retail	20.2
Education and health services	24.1	Other services	12.7
Financial activities	23.9		
Public administration	23.7		
Manufacturing	23.2		

Note. Based on author's calculations using data from U.S. Bureau of Labor Statistics (2014).

The impending retirement of the large Baby Boomer cohort, coupled with the relatively smaller size of succeeding generational cohorts, has major implications for the Social Security Administration's Old Age and Survivor's Insurance (OASI) program. In simple terms, the OASI trust fund is rapidly approaching insolvency (Social Security Administration, 2009a). The program operates as a "pay-as-you-go retirement system" (Social Security Administration, 2009a, p. 9), which uses the contributions of current employees and employers to provide for the payments to current beneficiaries (Ozawa, 2009). Any leftover funds are deposited into the trust

fund against future need. The Social Security Administration estimated (2009a) that in 2009 there were approximately 3.1 workers per beneficiary currently receiving benefits. The projection for 2035 is that the ratio will have dropped to 2.1 workers per beneficiary. As a result the Social Security Administration projected the need to tap the OASI trust fund by 2016 and projected its depletion by 2037. The schools of thought on dealing with this issue are essentially divided over whether the answer lies in privatizing the system (Kotlikoff, 1996a, 1996b) or modifying the existing system (Burkhauser & Quinn, 1997; Diamond & Orszag, 2005; Quadagno, 1996).

Privatization schemes, similar to those proposed by Kotlikoff (1996a, 1996b), generally recommend replacing the OASI program with IRA-like private investment vehicles. Looking at the Kotlikoff plan specifically, he acknowledged that one of the key economic issues with his approach is the ability of individuals to "invest their PSS contributions wisely" (1996b, p. 371). He additionally acknowledged the potential for political challenges as his system is less progressive in its provisions for the poor. The current system adjusts benefits according to an overall wage index (Social Security Administration, 2009b), which tends to increase benefits for the poorest beneficiaries compared to their actual contributions to the OASI program. His plan does not provide for such adjustments. Both concerns could, potentially, actually encourage older employees to retire early in order to maintain their coverage under OASI if they perceived impending adoption of the Kotlikoff program. If that behavior did occur, it would seem likely to hasten the exhaustion of the OASI trust fund. Of course the recent economic crisis, to be discussed shortly, would likely cast Kotlikoff's plan in a negative light, especially given his acknowledgement that the plan would require individuals to appropriately invest their contributions.

Some suggestions for modifying the existing OASI program (Diamond & Orszag, 2005) essentially proposed a combination of benefit amount reductions coupled with contribution tax increases in order to "close the underlying Social Security deficit" (2005, p. 11). Although the details of the proposed modifications are more intricate than the simple statement presented here, the twin impact of decreased benefits and increased taxes implies the political resistance from and perceived economic issues for workers under an OASI program modified in this manner. The fear of such impending changes might also serve to encourage older workers to retire earlier than they would otherwise.

The institution of means-testing (Quadagno, 1996) also has been suggested as a potential method for addressing potential shortfalls, while also addressing the perceived inequity of younger, less wealthy, workers essentially paying benefits for much wealthier older workers who do not necessarily need to depend on Social Security. As noted by Quadagno, proposals to introduce means-testing have been met with a variety of arguments including attempts to cast it as a transformation of the social security system into a welfare program, as opposed to a system designed to return to the older worker what is rightfully theirs based on their lifelong contributions. In fact, there is some concern that "imposing a means test could undermine public support for the Social Security program (American Academy of Actuaries, 2012, p. 4), especially if many begin to perceive it "as a government-mandated income redistribution program" (2012, p. 4). If, however, means-testing was implemented, it seems possible that it might encourage some older workers to retire earlier in an effort to do so at a time when they would still "pass" the means test, and thus collect from the system to which they had long contributed. On the other hand, for older workers whose personal wealth would fall above the imposed limit, the implementation of a means test would, at least, take the stream of income from Social Security

off the table as a factor in deciding when to leave the workforce, and could, potentially, encourage some to continue working to continue building their wealth, as that would now be the sole source of their eventual retirement income.

Other recommendations for modifying the OASI program suggest changing the age at which an employee may take early retirement. Burkhauser and Quinn suggested raising the age from 62, its current level, to the "1961 level of age 65" (1997, p. 12). Although they noted that such a change might create economic hardships for a relatively small number of workers, they believed that research supported the idea that those who retire early under the current age limit are generally still physically healthy enough to work. They found that, looking only at male workers, relatively few early retirees were "both in poor health and dependent on Social Security as their only source of pension income (only 7 percent of the white males and 11 percent of the black males)" (1997, p. 13). Raising the age at which early retirement may be taken would, of course, help stem the tide of Baby Boomer retirements slightly and could potentially extend the date of exhaustion of the OASI trust fund. Additionally, they recommended allowing workers at or over the age of 65 "to opt out of additional Social Security contributions and forego average monthly earnings recalculations" (1997, p. 13). This would encourage continued employment at and beyond retirement age even if the work is lower-paid part-time employment. Under the current system, older workers who continue to work at these lower-paid jobs may experience a reduction in their Social Security benefit, due to the earnings calculations, as well as make less than they might due to the need to still contribute to the OASI program. Of course, it should be noted that Kotlikoff's (1996a, 1996b) recommendations and the means-testing proposals (Quadagno, 1996) were primarily focused on addressing the OASI's impending insolvency while Burkhauser and Quinn recommended ways to encourage the continued employment of older

workers. However, all are closely tied to the difficulties facing the OASI program and all have potential effects, albeit in different directions and to different degrees, on the retirement behavior of older workers.

The recent economic crisis has added a new element of complexity in the retirement decision making process as Baby Boomers approach the decision "with a sharpened appreciation of risk" (Ekerdt, 2010, p. 70). Evidence appears to indicate that the recession has already driven many older workers to either postpone retirement or return to work due to financial pressure. According to the Economic Policy Institute (EPI), the percentage of Americans aged 55 and up in the labor force "jumped 1 percentage point since the recession began in December 2007 (from 38.8% to 39.8%), reaching its highest level since 1964" (Garr, 2009, p. 1). Furthermore, the EPI report indicated:

> The higher-than-normal participation increases for older workers suggest that the flailing economy has given them an added incentive to stay in their jobs, or return to the workforce, rather than retire. In May of 2008, participation rates began rapidly accelerating, and reached a peak of 27.7 million in October …. By contrast, younger workers' participation began a steep descent, likely because fewer jobs became available. (2009, p. 2)

Current State of Practice

Although retirement decision-making may be a primarily voluntary process for some workers, there are many variables that contribute to the variance in intended retirement age. A generally accepted model of retirement behavior developed by Beehr (1986) indicates that the retirement decision-making process is informed by both personal factors and environmental forces. According to the model, presented in Figure 1, the personal factors include elements such

as personality, sense of skill relevance to the job, as well as physical and financial health (Barnes-Farrell, 2003; Beehr, Glazer, Nielson, & Farmer, 2000). The environmental forces are subdivided into job (goal achievement and job characteristics) and non-job (family life and leisure pursuits) factors (Beehr, 1986, p. 46). Beehr further characterized the environmental non-job factors as "pulling" employees away from continued employment and the environmental job factors as "pushing" employees towards retirement. The following overview of the relevant research follows the general structure of Beehr's model. However, to provide context for the discussion of the job characteristic environmental forces in Beehr's model, a discussion of research exploring Hackman and Oldham's (1976, 1980) Job Characteristics Model (JCM) will be presented first.

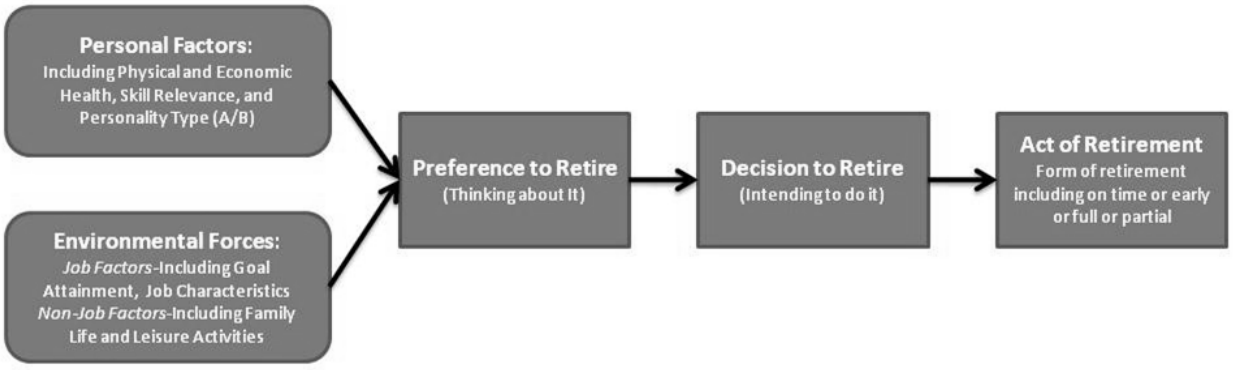

Figure 1: Beehr's model of retirement. Author created figure adapted from Beehr (1986, p. 46).

The Job Characteristics Model (JCM)

As noted previously, the JCM (Hackman & Oldham, 1976, 1980) proposes that five core job dimensions (skill variety, task identity, task significance, autonomy, and feedback) create three critical psychological states (experienced meaningfulness, experienced responsibility, and knowledge of results) for employees that then lead to four positive personal and work outcomes (work motivation, work performance, work satisfaction, and lower absenteeism and turnover). The model, which is presented in Figure 2, also suggests that the influence of the core job

dimensions is moderated by several other variables, including the growth need strength of the employees, their knowledge and skill relative to the job they are performing, and other contextual factors of the job and organization.

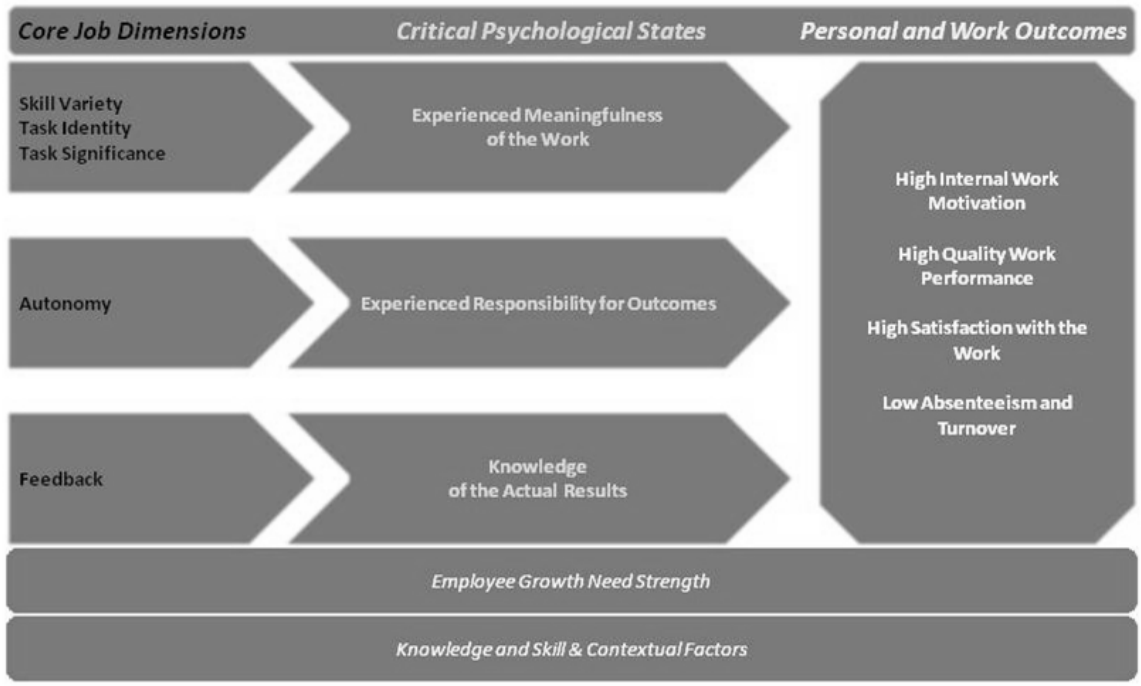

Figure 2: The Job Characteristics Model. Author created figure adapted from Hackman and Oldham (1976, 1980).

An extensive number of studies have evaluated the validity of the JCM. A meta-analysis of the existing research (Fried & Ferris, 1987) concluded that the model "has received modest support" (p. 309) and the authors made several recommendations for theoretical and methodological modifications that might improve validity.

Fried and Ferris (1987) noted that several studies have called into question the number of core job dimensions that actually exist, with several researchers having suggested that three of the dimensions in the model as originally proposed (Hackman & Oldham, 1976, 1980) may actually represent only a single dimension. Specifically, "skill variety, task significance, and job autonomy might be part of one dimension because of high possible cross-factor loadings among

items of these dimensions" (Fried & Ferris, 1987, p. 300). Other studies have suggested that all five of the core job dimensions described by the JCM actually load onto a single dimension (Dunham, 1976). However, it appears that most research using the JCM continues to accept the original number of core job dimensions as specified by the model.

Idaszak and Drasgow (1987) found that factor analysis of data collected with the Job Diagnostic Survey (JDS) instrument also suggested a number of core job dimension factors inconsistent with the five specified by the JCM. The JDS was the original instrument used to collect data during development of the JCM (Hackman & Oldham, 1974, 1975, 1980) and has long been used by other JCM researchers. Idaszak and Drasgow determined that the inconsistency was due to a design issue with the original JDS that involved the use of reverse codings for several survey items. Their research led to the development of a revised JDS that Idaszak and Drasgow claimed largely eliminated this measurement issue, simply by changing the reversed coded survey items so that they were no longer reversed. While Fried and Ferris (1987) noted that measurement artifacts similar to those discovered by Idaszak and Drasgow may explain the inconsistent factor solutions found in other studies of the JCM, a comparative study of the original and revised JDS (Kulik, Oldham, & Langner, 1988) concluded that the revised instrument did not improve the predictive power of the JDS. Kulik et al. suggested that Idaszak and Drasgow's (1987) failure to perform a comparison between the two versions of the JDS may have left open the possibility that their findings were "a function of the characteristics of the sample they used to assess the instrument" (Kulik et al., 1988, p. 462), rather than reflective of any improved utility of the revised JDS. Their study provided convincing evidence that the revised form of the JDS was virtually indistinguishable from the original form in terms of fit to the Job Characteristics Model predicted outcomes. Perhaps most importantly, Kulik et al.

recommended that continued use of the original form of the JDS facilitated comparison of results with the vast majority of studies that have employed that instrument. For that reason, in this study I used the original form of the JDS, as specified by Hackman and Oldham (1976, 1980).

Fried and Ferris (1987) also noted conflicting results regarding the collective assessment of the influence of the core job dimensions. They reported that:

> The model also appears to be supported with regard to the proposal that the MPS, as a multiplicative summary index of the five core job dimensions, is a better predictor of the dependent variables than is any of the individual job dimensions alone. However, a simple additive index was found to be a better predictor of outcomes than the MPS. (1987, pp. 312-313)

However, they noted that the MPS is, in some cases, a better predictor of the effect of moderating variables (Ferris & Gilmore, as cited in Fried & Ferris, 1987). The original plan for this study was to analyze the data using the simple summed total measure as derived from the five core job dimensions assessed by the JDS. However, the results of factor analysis of the JDS suggested a two-factor solution, which led to the abandonment of both the five-factor solution and the associated calculations of MPS scores.

Several studies cast doubt on the influence of the various moderating variables, such as growth need strength (the extent to which an employee desires growth in their work), employee knowledge and skill, and contextual factors, suggested by the JCM as originally specified (Fried & Ferris, 1987; Tiegs, Tetrick, & Fried, 1992). However, as changes in employees' relative needs to experience growth seem likely to correlate with age, including a measure of growth need strength (GNS) as part of the analysis seemed advisable. Champoux (1991) noted that GNS appears to exhibit a different form of interaction with the other variables of the JCM for those

with a low GNS than it does for with a high GNS, which further supports the decision to include at least that variable in the study design.

Personal Factors: Physical and Economic Health

In specifying his model of the retirement process, Beehr (1986) proposed that the likelihood of retirement would be increased for those individuals experiencing chronic health problems. However, he raised the possibility that the influence of health may increase with age, assuming that older individuals may be more likely to experience health issues, thus suggesting that health may not play the same role for early retirement as it does for retirement at or after normal retirement age. Additionally, he noted that at least one study (Schmitt & McCune, 1981) did not find support for a significant relationship between health and retirement, all other considered demographic variables being equal. Conversely, a later study intended to test Beehr's model (Taylor & Shore, 1995), did substantiate Beehr's expected link between health and retirement timing. A recent study in Canada (Schirle, 2010) suggested that the likelihood of retirement is increased by up to 25 percent for those experiencing poor health.

Beehr (1986) also proposed that the likelihood of retirement would be increased for those individuals with an expectation of sufficient financial resources once they enter retirement. However, he cited research by Sheppard that suggested financial resources play a far more significant role in the retirement plans of blue collar workers as compared to white collar workers. Additionally, he proposed that financial resources are a stronger influence on the decision to retire early as compared to the decisions to retire at or after normal retirement age. He explained that this may be due to tradeoffs incurred by those who retire early in the form of reduced retirement income and lost years of working income at presumably increased wages.

Analysis of data collected as part of the longitudinal Health and Retirement Study (Pang, Warshawsky, & Weitzer, 2010) offered strong support for Beehr's view.

Although there is "substantial support" (Barnes-Farrell, 2003, p. 159) for personal financial and physical health as variables that impact retirement decision-making, Barnes-Farrell suggested they may actually "mitigate the influence of other individual and contextual variables that would otherwise lead workers to remain on the job or retire from the workforce" (p. 159). Others note that "finances have been the most consistent predictors of retirement in prior research" (Beehr et al., 2000, p. 216) and that health "has probably been the second most consistent predictor" (p. 219). However, it seems clear that both variables may exhibit complex relationships to the timing of the retirement decision.. As such, both physical and financial health are necessary control variables in any study of retirement decision making.

Given recent changes in the global economy, any discussion of the relationship between financial health and retirement timing also necessitates consideration of the possible influence periods of recession may have on individuals' retirement behavior. In an analysis of Census data for men for the years 1980 through 2009, Coile and Levine (2011) reported

> The results indicate that a higher unemployment rate leads to a greater probability of withdrawal from the labor force (retirement) as workers age, particularly after age 62 when Social Security benefits are available. A one percentage point increase in the unemployment rate is estimated to increase the number of 62-64- and 64-69-year-old workers who are out of the labor force by over a full percentage point. The effects are stronger for high school dropouts and high school graduates than for those with at least some college education. (p. 25)

Coile and Levine (2011) concluded that their analysis indicated a reduction in retirement income when a recession occurs during the years preceding retirement. McFall's (2011) analysis of data from "fortuitously timed pre-and postcrash surveys by CogEcon to study the impact of wealth shocks on the age at which older adults expect to retire" (p. 40) indicated that the loss of stock wealth due to the recession correlated with an expected delay, on average, of approximately 2.5 months. Goda, Shoven, and Slavo (2011) appeared to support the findings of both Coile and Levine (2011) and McFall (2011), having reported an increase in the likelihood of working at age 62 for Health and Retirement Study survey data from 2008 when compared to 2006. They noted that the effect is stronger for those experiencing larger losses of wealth while the increase in unemployment had an attenuating effect. As suggested in an earlier analysis by Coile and Levine (2009) it appears that losses of wealth may result in delayed retirement for workers who had been relatively wealthy at the time of a recession while those with lower levels of wealth, when confronted by high levels of unemployment, will withdraw from the workforce earlier than they would have otherwise.

Personal Factors: Skill Relevance

Beehr's model (1986) proposed that employees' job skill obsolescence increases their likelihood of retiring. He attributed this relationship to two causes. The first is a sense of dissatisfaction on the part of the employee, who "may feel unhappy doing work for which they are ill-prepared and at which they probably perform poorly" (1986, p. 47). The second is a preference on the part of organizations for replacing, rather than retraining, older workers who lack necessary skills. Barnes-Farrell (2003) noted that research has established a link between employees' perceptions of a loss of effectiveness on the job and the decision to retire. However, it seems likely that employees' perceptions of job skill obsolescence are, at least in part, due to

factors other than a gradual loss of skill relevance and inability to maintain pace with changing job demands. Numerous studies have suggested that attitudes characteristic of ageism remain prevalent in organizations, in part as the stereotype that older employees are incapable of acquiring new skills cost effectively (Dennis & Thomas, 2007; McMullin & Marshall, 2001; Reio Jr & Sanders-Reio, 1999; Yeatts, Folts, & Knapp, 2000). As noted by Yeatts et al., "an older employee's ability and choice to adapt to a redesigned work environment can be greatly affected by personnel practices" (2000, p. 577) and those practices may play a large role in discouraging older employees from engaging in efforts to stave off skill obsolescence.

As Guthrie and Schwoerer (1996) noted, "in attempts to link age with work related outcomes, a large body of research has failed to establish systematic or significant relationships with either performance or attitudes" (p. 60). Their research indicated that later career employees may possess (in comparison to early and mid-career employees) more negative attitudes toward the usefulness of training and their ability to be successful in training situations. However, their work also suggested that these attitudinal differences are not necessarily objective and that employees' self assessments regarding training "can be systematically affected by factors other than actual need" (1996, p. 59). As Yeatts et al. (2000) suggested, organizational practices may be the source of that bias.

The JCM (Hackman & Oldham, 1976) suggested that employees' knowledge and skill relating to their job act as moderating variables of the relationship between the core job dimensions and the positive personal and work outcomes. Specifically, Hackman and Oldham suggested that enriching a job through the five core job dimensions will be less likely to lead to the positive individual and work outcomes if the employee lacks the necessary knowledge and skills to perform the job. If employee skills become obsolete over time, or if employees merely

perceive they are incapable of keeping up with changing job demands, the result could be interpreted as a relative decrease in needed knowledge and skills.

Personal Factors: Personality Type

Beehr (1986) also proposed that employees who exhibit "Type A behavior, characterized by hard-driving, aggressive, impatient activity" (p. 47) will be less likely to retire because they "are more likely to miss the chance to compete and to work at a fast pace" (p. 47). Type B individuals, who are less likely to persevere in their efforts after encountering failure or difficulty (Schaubroeck & Williams, 1993), may, on the other hand, be more likely to become discouraged by the impact of age discrimination-related barriers in the workplace, which could lead them to be more likely than their Type A counterparts to consider retirement in the face of those challenges. While some research has reported that Type A individuals are more likely to view their retirement as involuntary, and report lower levels of satisfaction with retirement (Swan, Dame, & Carmelli, 1991), there appears to have been little work done to establish whether Type A or Type B behaviors are actually predictors of retirement timing. There have been several studies of retirement and personality, as operationalized through the five factor model (Löckenhoff, Terracciano, & Costa Jr, 2009; Robinson, Demetre, & Corney, 2010), but their focus was also retirement satisfaction as opposed to retirement timing.

Environmental Forces: Non-job Factors

Beehr (1986) suggested that the retirement decision should be influenced by the employee's marital status and other aspects of family life. However, he noted that, at the time, there was a dearth of research into the possible influence of such variables on the timing of the retirement decision. Since then, a fairly extensive amount of research has been done in these areas (Dahl, Nilsen, & Vaage, 2003; Flippen & Tienda, 2000; Kubicek, Korunka, Hoonakker, &

Raymo, 2010; Peracchi & Welch, 1994; Pienta & Hayward, 2002; Ruhm, 1996; Szinovacz, 2006; Szinovacz & DeViney, 2000; Szinovacz, DeViney, & Davey, 2001).

A study of U.S. census data from 1968 to 1990 (Peracchi & Welch, 1994) indicated that unmarried men are both more likely to retire and less likely to return to work after retiring while unmarried women are both less likely to retire and more likely to leave retirement to resume working. Flippen and Tienda (2000), in a study of longitudinal data from the Health and Retirement Study also found that unmarried men are less likely than married men to be employed when older, while older unmarried women are more likely to remain in the labor force. However, as noted by Dahl, Nilsen, and Vaage (2003), Ruhm (1996) finds that data from a 1989 survey of 1,373 individuals indicated that "unmarried 55- to 59-year-old men and women are shown to hold jobs at similar rates, once the sample is limited to persons with some recent history of employment" (Ruhm, 1996, p. S11).

For married individuals, the probabilities of retirement for men and women appear to follow a different pattern than that suggested for unmarried individuals. Pienta and Hayward (2002) noted that husbands are more likely than wives to work full time after age 62 and after age 65, although "neither husbands or wives report strong probabilities of working full time after age 62 or age 65" (p. S204). Szinovacz and DeViney (2000) offered a possible explanation, having suggested that the generally younger age of wives partially explains their finding that "husbands seem to postpone their retirement until their wives reach Social Security or pension eligibility, whereas wives' retirement is more subject to the couple's overall economic situation" (2000, p. 489).

Research further suggests that the relationship between marital status and retirement timing is subject to a variety of interaction effects with a wide assortment of other variables that

frequently impact men and women differently. Both Kubicek et al. (2010) and Szinovacz and DeViney (2000) noted that marital satisfaction and early retirement are positively related. Szinovacz and DeViney also found that a feeling of dependence on the marital relationship has a negative relationship with retirement for husbands, but no relationship for wives. Pienta and Hayward (2002) found that husbands with poor health are less likely to work beyond age 62, though poor health for wives exhibited no similar relationship. Szinovacz and DeViney (2000) found that husbands with a wife in poor health are more likely to retire while the reverse does not appear to hold true for wives. Szinovacz and DeViney reported that marital history also plays a role, having noted that "remarried widowers are at less risk of retirement, whereas previously widowed wives are at greater risk" (2000, p. 492). In regards to education, Pienta and Hayward (2002) found that "more years of education increase expectations of delayed retirement for both husbands and wives…although the education effect is attenuated for wives once spouse characteristics are controlled for" (p. S205). Szinovacz, DeViney, and Davey (Szinovacz et al., 2001) noted that relationship between family obligations for the care of dependents and retirement timing is subject to a complex set of interaction effects including marital status, gender, race, and even the level of contact with dependents (i.e. partial custody situations).

Beehr (1986) also proposed that "employees are more likely to decide to retire to the extent that they have attractive alternative (leisure) activities" (p. 50), though he cited no research to support this proposition. While there appears to be a substantial body of work examining the role of leisure after retirement (e.g., Atchley, 1971; Ekerdt, 1986), there is little to none establishing a strong relationship between leisure and the timing of retirement. Broderick and Glazer (1983) reported "a significant correlation between the total number of hours devoted to leisure activities before retirement and the degree of total retirement planning" (p. 19).

However, their data did not support a relationship between positive attitudes toward retirement and pre-retirement leisure activity levels. Additionally, the sample consisted solely of already retired individuals and no data was collected regarding the timing of the retirement decision.

Environmental Forces: Job Factors

Barnes-Farrell's (2003) review of the literature indicated that the lion's share of research efforts have focused on the personal factors, including physical and financial health, familial responsibilities, job satisfaction, and attachment to job or career. Also, most studies appear to look at various factors according to Beehr's "push/pull" conceptualization (1986). However, there have been relatively few explorations of the job characteristics element of the environmental forces (Beehr et al., 2000; Taylor & Shore, 1995) and it appears that most of the existing studies continued to characterize job factors as "pushing" employees towards retirement. As an example, Kosloski, Ekerdt, and DeViney (as cited in Smyer & Pitt-Catsouphes, 2007) noted a "push" effect associated with "negative work experiences" (p. 26). However, according to Smyer and Pitt-Catsouphes' interpretation of those findings, "employees who find meaning in their work, who find it engaging and report high levels of job satisfaction, are more likely to want to keep working" (2007, p. 26). The difference in interpreting such results is an exercise in looking at the inverse relationship, but it seems possible that the predilection of many study designs only to consider job characteristics as "push" factors may inadvertently obscure potentially useful conclusions. Studies of these job characteristics may reveal techniques organizations could employ to reduce the "push" towards retirement. Additionally, such studies may reveal variables that may serve to "pull" employees towards continuing their careers even when retirement is a viable option. Thus, given the objective of the current study, this section of

the literature review will examine the current state of research looking at the relationship between various job characteristics and retirement decision making.

Hayward, Friedman, and Chen (as cited in Szinovacz, 2003) noted that the decision to retire was related to the job characteristics of both the employee's position of longest tenure and their current job. According to Szinovacz, "workers in long-term jobs demanding high social skills were less likely to retire as were those whose current jobs entailed high substantive complexity" (2003, p. 26). In a separate study, Hayward (1986) also found that, for men, "substantive complexity decreased the odds of early retirement" (p. 1040) and concluded that this was an indication that complex jobs that provided some level of autonomy and pacing control to the employee were likely to be found favorable by older workers. A later study by Pienta and Hayward (2002) also found that job characteristics influence retirement timing, again with a difference between men and women, having reported that for husbands "cognitive job demands significantly increase the delayed retirement expectations, although no such effects are observed for wives" (p. S206). Schmitt and McCune (1981) similarly found that early retirement was predicted in part by the perception by employees that their job lacked challenge or didn't provide much involvement, though they reported no significant gender interaction. Parkinson (as cited in Smyer & Pitt-Catsouphes, 2007) also found additional support for several of these job characteristics positively influencing the work of older employees:

> Among the 52 percent of respondents to the recent Conference Board survey who were not planning to retire, 62 percent reported that one factor in their decision to continue to work was that they found their jobs interesting; furthermore, 46 percent of the respondents said that they have not yet reached their professional goals, and 72 percent stated that they felt capable of assuming more responsibilities. (p. 26)

Substantively complex jobs, defined as those requiring "thought and independent judgment" (Schooler, Mulatu, & Oates, 1999, p. 485) appear to positively impact the ability to think when in complex situations (Kohn & Schooler, 1973; Schooler et al., 1999) as well as other aspects of personality, including the perception that one is self-directed (Kohn & Schooler, 1982). Schooler et al. (1999), through an analysis of extensive longitudinal data, found that the positive relationship between substantively complex jobs and the ability to function intellectually appears to persist throughout one's working life. In relation to older employees, they reported that "the positive effect on intellectual functioning of doing substantively complex paid work appears even greater for older than for somewhat younger workers" (1999, p. 491). They also found support for a reciprocal effect, where "high levels of intellectual functioning result in substantively complex jobs" (1999, p. 491) and note that the size of the reciprocal effect was significant and similar for both older and younger workers.

Some of the early research looking at job characteristics (Quinn, 1978) focused primarily on the characteristics as they were defined by job descriptions rather than employee perceptions. However, many later studies have examined employees' assessments of their job characteristics and many of the variables examined map closely to the core job dimensions of the Job Characteristics Model (Hackman & Oldham, 1976, 1980). While a thorough discussion of the JCM is presented in the conceptual framework section of this chapter, the reader is reminded that the five core job dimensions are skill variety, task identity, task significance, autonomy, and feedback.

The studies already mentioned that noted a relationship between substantive complexity, job satisfaction, intellectual capability, and/or job involvement and the timing of the retirement decision (Hayward, 1986; Kohn & Schooler, 1973, 1982; Pienta & Hayward, 2002; Schmitt &

McCune, 1981; Schooler et al., 1999; Szinovacz, 2003) appear to closely map to the JCM (Hackman & Oldham, 1976) core job dimension of skill variety in combination with autonomy and the outcome of internal job satisfaction. Kilty and Behling (1985) concluded that people retire early because they lack control and interest in their work and were able to demonstrate a negative relationship between both the core job dimension of autonomy and one of the critical psychological states of the JCM (Hackman & Oldham, 1976), meaningfulness, and the intent to retire early. Blekesaune and Solem (2005) observed that low levels of perceived autonomy led to early retirement for men but not for women. They concluded that, in general, the lack of autonomy decreased the attractiveness of the work, thus encouraging retirement at earlier ages. They hypothesized that women's ability to choose early retirement from jobs with low autonomy was heavily constrained because "they have spent fewer years in the workforce and may have less reason to leave, particularly if they have built up less of a financial cushion" (2005, p. 24). Brougham and Walsh (2009) also found that employees who intended to retire early reported lower levels of autonomy, as well as lower levels of experienced meaningfulness, which is one of the critical psychological states of the JCM, and lower levels of desire for growth. Notably, desire for growth appears to be an analogue of growth need strength, which is suggested by the JCM to moderate the relationship between the core job dimensions and the positive personal and work outcomes.

The core job dimensions (Hackman & Oldham, 1976) of task identity, task significance, and feedback appear, in the literature discovered to date, to have received little attention by researchers. One exception is Brougham and Walsh (2009), who did investigate the levels of feedback reported by those who intended to retire early, but the findings were not significant. Schmitt and McCune (1981) actually employed a modified form of the Hackman and Oldham's

Motivating Potential Score (MPS), which included as components measures of task identity and task significance but excluded any measure of feedback. Their longitudinal study found a significant relationship, which they interpreted, as noted previously, as suggesting that those who retire early tend to perceive their jobs to be less involving and challenging. However, they did not assess the possible relationships between the raw scores for the components of the MPS and the intention to retire early.

Beehr (1986) proposed that the retirement decision may also be influenced by employee perceptions of the degree to which they have achieved their occupational goals, though he noted that, at the time he formulated his model, there was a dearth of research regarding this relationship. While this still appears to be a neglected area of investigation, two studies by Brougham and Walsh (2005, 2007) appear to have demonstrated that employees' retirement intentions are influenced by perceptions of the level of compatibility they perceive between working or retiring and their occupational and non-occupational goals. In brief, when employees perceive that retiring conflicts with occupational goals they are less likely to express an intent to retire. Conversely, when personal goals are perceived as incompatible with work employees are more likely to express an intent to retire. As noted by the researchers, this finding supports the prediction of image theory "that perceived incompatibility between goal achievement and working (progress decision) or retiring (adoption decision) should be good predictors of people's retirement intent" (Brougham & Walsh, 2007, p. 224).

While Brougham and Walsh's (2005, 2007) findings are intriguing, and supportive of Beehr's (1986) proposed role for occupational goals in the retirement decision, it should be noted that both of their (Brougham and Walsh's) studies appeared to sample the same population and that participants ages for both studies only included the range from 55 to 77. Additionally,

respondents were only asked about their retirement intentions for periods of one, three, and five years from the date of response. Thus, while the studies may have demonstrated a relationship between goal attainment and the retirement decision for those for whom the decision is relatively temporally proximal, no such relationship is suggested for those for whom the decision is more distal. The use of what appears to be the same population for both studies suggests that the latter study failed to increase the generalizability of the findings of the earlier study, which is not unusual. However, in the apparent absence of substantial additional research in this area, the validity of their findings remains difficult to assess. As a practical consideration, full assessment of the goal taxonomy employed in these studies requires a survey instrument that takes up to one hour to complete. Inclusion of such an instrument in the currently proposed research is, sadly, not feasible.

Analysis

The preceding review of the literature appears to provide sufficient warrant for further investigation of the relationship between the core job dimensions of the Job Characteristics Model (Hackman & Oldham, 1976, 1980) and employees' intended timing of their retirement decision. While fairly consistent support, allowing for differences in sampling and measurement, has been established for the variables of autonomy (e.g., Blekesaune & Solem, 2005; Brougham & Walsh, 2009; Hayward, 1986; Kilty & Behling, 1985) and, skill variety (e.g., Brougham & Walsh, 2009; Hayward, 1986), the remaining core job dimensions have received scant attention. Schmitt and McCune (1981) came closest to testing the JCM as a whole, but their study failed to measure the effect of feedback. The exclusion of feedback as a variable is potentially problematic as a meta-analysis of JCM research (Fried & Ferris, 1987) indicated that "instead of influencing only the knowledge-of-results psychological state, job feedback seems to affect all

three of the critical psychological states" (p. 314). Thus, Fried and Ferris suggested that feedback, as a core job dimension, may influence all four of the positive personal and work outcomes of the JCM. As job feedback is likely far easier to modify than the other core job dimensions, research that supports a relationship between feedback and the timing of the retirement decision may suggest implications for practice that may facilitate organizational efforts to retain older employees longer.

Studies of the relationship between the core job dimensions of the JCM (Hackman & Oldham, 1976) and the intended timing of employees' retirement decision has also, to date, generally failed to evaluate the influence of the growth need strength (GNS) variable. Champoux (1991) noted that the interactions between GNS and the other variables of the JCM take different forms as the level of GNS varies. Thus, it seems likely that any study of the relationships between the core job dimension variables and retirement should also measure and evaluate the subjects' levels of GNS.

Significance of the Study

This study sought to provide a more complete assessment of the potential relationship between the core job dimensions of the JCM and employees' intended timing of the retirement decision. This study was positioned to address an apparent gap in the existing research by analyzing all of the individual component dimensions, as represented by the factors derived by the factor analysis of the Job Diagnostics Survey (Hackman & Oldham, 1976, 1980) to the dependent variable, intended retirement timing. The study also measured and included in the analysis the various intervening variables suggested by the JCM, which have generally not been evaluated by existing research.

Additionally, this study attempted to address another perceived weakness in the design of many of the existing retirement studies. Studies that assess employees' intended age of retirement, as the dependent variable, generally treat the data as a continuous variable, age in years. As noted by Ekerdt (2010), "age of transition variables are not truly continuous owing to the pension, tax, and administrative implications of retirement at one age versus another" (p. 72). In light of this observation, this study assessed the intended age of retirement as an ordinal variable operationalized as age ranges that cover periods before, at, and after the normal retirement age as defined by the Social Security Administration (2006). Further details on the measurement of this variable and the statistical analysis techniques employed are presented in the methodology chapter.

Conceptual Framework

Based on the review of the literature, the original conceptual framework for this study was based on Beehr's (1986) model of the variables influencing retirement decision making with particular focus on job characteristics, as operationalized through the lens of the Core Job Dimensions as described in the Job Characteristics Model, or JCM (Hackman & Oldham, 1976, 1980), which are typically expressed as a collective measure through the calculation of a Motivating Potential Score (MPS). The conceptual framework is presented graphically in Figure 3. While analysis of the data collected led to a two, rather than five, factor solution for the identified job characteristics, the conceptual framework represents the original intended design of the study.

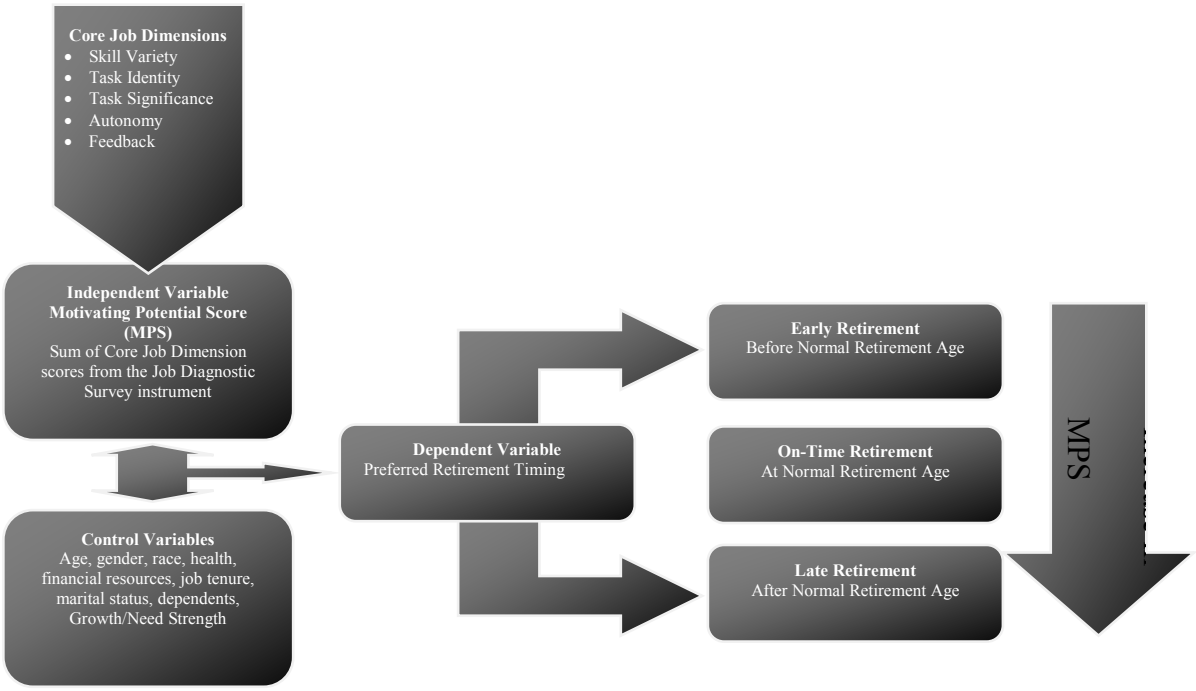

Figure 3. Conceptual framework incorporating elements of the JCM (Hackman & Oldham, 1976, 1980) with Beehr's (1986) model.

As noted in the first chapter, the general research hypothesis for this study is that, all other things being equal, as the levels of the identified (positive) job characteristics factors increase, the probability of retiring early, before the normal age range, will decrease. For this study, the age range of 66 to 67 represents normal retirement age, as 66 was the age of eligibility for retirement with full Social Security benefits for those born between 1943 and 1954, after which the age of eligibility gradually increased to 67, which applies to everyone born since 1960 (Social Security Administration, 2006). I also hypothesize that as the (positive) job characteristics factors increase, the probability of intending to retire later (after the normal retirement age range) will increase.

The warrant for looking at the timing of the retirement decision through the lens of the JCM (Hackman & Oldham, 1976) is based on the theory's suggestion that the critical psychological states created by the presence of the core job dimensions that lead to positive work

and personal outcomes including a reduction in turnover and absenteeism, would also reduce early retirement and contribute to late retirement. While Adams and Beehr (1998) made the claim that turnover and retirement should be considered as separate constructs, or forms of withdrawal, most of the other studies that examine the relationship between various aspects of the JCM and retirement have treated retirement as a form of organizational withdrawal, with many having cited the work of Hanisch and Hulin (1990, 1991). Additionally, while Adams and Beehr made a case for retirement and turnover as separate constructs with several unique antecedent variables, the only independent variable drawn directly from the JCM that they tested was job satisfaction. They found that both turnover and retirement were negatively related to job satisfaction, although they noted the relationship to retirement was not significant in their results. As job satisfaction and turnover are both dependent variables within the JCM theory, Adams and Beehr's findings, while informative to the proposed research, do not necessarily suggest that the JCM's core job dimensions, through the mechanism of the creation of critical psychological states, have no influence on the timing of employee's retirement decision. The JCM does not suggest that job satisfaction decreases turnover. Instead it suggests that variance in both job satisfaction and turnover can be attributed to the perceived levels of the core job dimensions through the mechanism of the critical psychological states. Furthermore, Beehr and Bennett (2007) cited only the work of Adams and Beehr and an unpublished dissertation by Rubenstein as evidence that "the similarities between retirement and turnover, and retirement and other withdrawal behaviors, are few in number" (2007, p. 296), which appears to be fairly weak support for contradicting relationships presumed to exist in much of the rest of the retirement literature. As they, themselves, acknowledged, this is an area that would seem to call for further research.

CHAPTER THREE

METHODS

Purpose of the Research and Rationale

The purpose of this study was to examine the possible relationships between factors that are modifiable by organizations and the expected timing of employees' retirement decision. While there are many possible factors under the control of organizations, this study focused on job design/job enrichment variables as proposed by the Job Characteristics Model (Hackman & Oldham, 1976, 1980). Specifically, this study investigated how the critical job dimensions of the Job Characteristics Model (JCM) may influence the intended timing of employees' retirement.

The ontological basis for this study is essentially captured in some of the assumptions presented in Chapter 1. The list included the ontological assumption that employees have some agency in choosing when to retire, and the key epistemological assumption that the Job Diagnostics Survey, as a measure of the elements of the Job Characteristics Model (Hackman & Oldham, 1976, 1980), captures employees' perceptions of some of those job characteristics that may influence the decision regarding the timing of eventual retirement.

These assumptions illustrate that the proposed research is firmly rooted in the postpositivist worldview (Creswell, 2009). In keeping with Creswell's description of this paradigm, the research seeks to identify the probabilistic relationships between the independent variables related to job characteristics and the dependent variable of the intended timing of retirement as before, at, or after the normal retirement age. As methodology follows epistemology (Babbie, 2008), this epistemological approach informs the choice for this study of a quantitative methodological approach, which I describe in the following section.

Research Design

I conducted the study using cross sectional survey research methods that sought to analyze correlational relationships between several independent variables and the dependent ordinal variable of intended timing of retirement. The independent variables, as originally defined (verbatim, with italics added) by Hackman and Oldham (1976, pp. 257-258) are:

> *Skill Variety*. The degree to which a job requires a variety of different activities in carrying out the work, which involve the use of a number of different skills and talents of the person. (p. 257)
>
> *Task Identity.* The degree to which the job requires completion of a "whole" and identifiable piece of work; that is, doing a job from beginning to end with a visible outcome. (p. 257)
>
> *Task Significance.* The degree to which the job has a substantial impact on the lives or work of other people, whether in the immediate organization or in the external environment. (p. 257)
>
> *Autonomy.* The degree to which the job provides substantial freedom, independence, and discretion to the individual in scheduling the work and in determining the procedures to be used in carrying it out. (p. 258)
>
> *Feedback.* The degree to which carrying out the work activities required by the job results in the individual obtaining direct and clear information about the effectiveness of his or her performance. (p. 258)

The Job Characteristics Model, as originally specified, also identifies the employees' growth need strength (GNS) as a key moderating variable between the core job dimensions, critical psychological states, and positive personal and work outcomes (Hackman & Oldham,

1976, 1980). This variable is defined as a measure of employees' "needs for personal accomplishment, for learning, and for developing themselves beyond where they are now" (Hackman & Oldham, 1980, p. 85).

As noted in Chapter 1, the JCM, as originally specified, described a calculation identified as the Motivating Potential Score (MPS) as the recommended method for collectively representing the combined influence of the core job dimensions (Hackman & Oldham, 1980, p. 306). This calculation averages the scores for skill variety, task identity, and task significance and multiplies the result by the values for autonomy and feedback. However, Fried and Ferris' (1987) meta-analytical study demonstrated strong evidence that a simple summed total of the respective core job dimension scores was "a better predictor of work outcomes than the multiplicative MPS index" (p. 313). Based on these findings, the original study design called for measurement of the combined influence of the core job dimensions through a simple summed total of their respective scores. As mentioned previously, factor analysis indicated that the five-factor solution stipulated by the JCM was not valid for this sample, which led me to instead analyze the influence of the job characteristic factors identified by the two-factor solution.

The Job Diagnostic Survey (Hackman & Oldham, 1980), or JDS, was used to collect data for the above variables. The JDS consists of up to seven sections and collects the data necessary to assess the levels of the five core job dimensions defined. It also collects the data necessary to assess the level of growth need strength (GNS). The complete JDS, including the scoring key, can be found in the book *Work Redesign* (Hackman & Oldham, 1980, pp. 275-306). It should be noted that section six measures GNS by asking respondents to rate their desire to have various characteristics present in their jobs, while the seventh section provides an alternate measure of GNS by asking respondents to choose between two different jobs with different (positive and

negative) characteristics. Aldag and Brief (1979) named the measure of GNS in section seven as high-order need strength B (HONS-B), and described it (relative to the other scales within the JDS), as "undoubtedly the most difficult for a respondent to understand and use" (p. 716). They referred to the measure in section six as HONS-A, and noted that it was problematic in that it had a tendency to skew in the positive direction, while HONS-B was problematic in that it actually captured the relative strength of high-order versus low-order needs, instead of serving as "an absolute gauge of higher-order need strength" (1979, p. 708), which was true of HONS-A. Thus, in addition to the difficulty respondents have in using the HONS-B section of the JDS, the relative nature of the measure means that "individuals with identical scores on the scale may differ in absolute strength of higher-order needs" (1979, p. 716). In spite of the potentially problematic skew of the HONS-A measure, I chose to use it because it is an absolute scale and individuals with similar scores may, at least, be assumed to have comparable levels of higher-order growth need strength.

Existing research (e.g., Champoux, 1980, 1991; Fried & Ferris, 1987; Hackman & Oldham, 1974, 1975, 1976, 1980; Kulik et al., 1988; Rentsch & Steel, 1998; Tiegs et al., 1992) appears to have indicated acceptable levels of support for the validity and reliability of the JDS as an instrument for assessing the constructs described by the JCM. The instrument, and through it the theory, has been tested with many populations over more than 30 years.

The dependent variable, intended retirement timing (*RetTime*), was measured as an ordinal variable. Respondents were asked to respond to a question asking whether they intend to retire at four different age ranges, including: age 61 or earlier, between age 62 and 65, between age 66 and 67, and after age 68. These ranges correspond to two points prior to normal

retirement age, as defined by the Social Security Administration (2006), the normal retirement age range, and after normal retirement age. The survey item is presented in Appendix A.

Intended age of retirement is commonly used as a dependent variable in retirement research (Adams, 1999; Beehr et al., 2000). Adams cited support from Daniels and Daniels as well as Prothero and Beach for an acceptable level of correlation between expected and actual retirement age. While the accuracy of the predicted age of retirement response is open to some debate, there does appear to be some evidence that such estimates may be considered reliable. In a longitudinal study, Ekerdt, Bosse, and Mogey (1980) found that, although subjects initially expressed an earlier preferred retirement age, compared to their planned retirement age, as they aged the two values tended to converge at the later value. More importantly, the theory of planned behavior (Ajzen, 1991) would suggest that most subjects are well-positioned to make this type of prediction about their behavior. According to Ajzen's theory, the intent to behave in a particular way is derived from a combination of the individual's attitude toward the behavior, their perceived level of control in making the behavioral choice, and their own subjective norms. In this study it would appear that the subjects' predictions should have been fully informed by their attitudes and norms regarding retirement and they were being asked directly to consider their financial and physical health, which are the two major factors impacting their level of control. However, as Ajzen warns, "intervening events may produce changes in intentions or in perceptions of behavioral control, with the effect that the original measures of these variables no longer permit accurate prediction of behavior" (1991, p. 185). While it is not possible to fully control for these future events, the literature suggests that individuals are generally able to accurately predict their retirement behavior in light of the precepts of the theory of planned behavior.

The vast majority of studies discussed to this point tend to treat the expected age of retirement as a continuous variable. One advantage of such approach is access to linear regression models during analysis. However, Ekerdt (2010) noted that "age of transition variables are not truly continuous owing to the pension, tax, and administrative implications of retirement at one age versus another" (p. 72). Because of this, I made the decision to operationalize intended retirement timing as an ordinal variable for the purposes of this study.

Data regarding various control and potentially intervening covariate demographic variables was also collected via survey. These measures included assessments of anticipated physical and financial health, age, gender, race, job category, job tenure, marital status, spouse's intended time of retirement, number of dependents, type of retirement plan, anticipated health insurance coverage, anticipated adjustment to retirement, and tenure status for faculty. A discussion of how these variables were operationalized in the survey instrument follows. The actual survey items may be found in Appendix A.

The data on physical and financial health was collected using two two-item indexes originally used by Taylor and Shore (1995), who conducted a study based on Beehr's (1986) model of retirement. For the financial health index (*FinHealthIndex*), Taylor and Shore (1995) employed two survey items that asked "respondents whether they expected their pension would be adequate after retirement and whether they believed they would be financially comfortable past retirement" (p. 78). Both questions collected responses on a five-point Likert scale and the two responses were given equal weight by averaging their scores. This study used the same approach, although the first item was re-worded by replacing "pension" with "payouts from retirement plans (e.g., IRA, 401k, 403b, and/or pension) and social security", based loosely on a

similar approach used by Beehr et al. (2000) and intended to encourage respondents to consider all likely income stream sources.

Physical health (*PhysHealthIndex*) was assessed with two questions that, respectively, asked respondents to rate their overall health and to rate their belief "that their level of health would allow them to work as long as they wished" (Taylor & Shore, 1995, p. 78). As was the case in the Taylor and Shore study, both questions used a five-point Likert scale and the two responses were given equal weight by averaging their scores.

Respondents were asked to identify their year of birth, which was used to calculate their age by the end of 2013 (*AgeBEO2013*), and sex (*Female*). They were also be asked to identify the race and ethnicity (*RaceEthn*) with which they most identify according to the seven categories defined by the Equal Employment Opportunity Commission (2006, pp. 4-5). Those categories are shown in Table 3.

Table 3

EEOC Race and Ethnicity Categories

Hispanic or Latino
White (Not Hispanic or Latino)
Black or African American (Not Hispanic or Latino)
Native Hawaiian or Other Pacific Islander (Not Hispanic or Latino)
Asian (Not Hispanic or Latino)
American Indian or Alaska Native (Not Hispanic or Latino)
Two or More Races (Not Hispanic or Latino)

Note: Adapted from Equal Employment Opportunity Commission (2006, pp. 4-5).

Due to a small number of cases for several of the race and ethnicity categories, the variable *RaceEthn* was condensed into the dichotomous variable *NotWhite* as described in Chapter 4.

Respondents were asked to identify their job category (*JobCat*) using the ten categories defined by the Equal Employment Opportunity Commission (2006, pp. 5-6). Respondents were shown both the names of the categories and descriptions excerpted from those used by the Equal Employment Opportunity Commission. The ten categories and abbreviated descriptions are listed in Table 4.

Table 4

Job Categories and Brief Descriptions

Job category	Brief description
Executive/Senior level officials and managers	Individuals who plan, direct and formulate policies, set strategy and provide the overall direction of enterprises/organizations for the development and delivery of products or services, within the parameters approved by boards of directors or other governing bodies.
First/Mid-level officials and managers	Individuals who serve as managers, other than those who serve as Executive/Senior Level Officials and Managers, including those who oversee and direct the delivery of products, services or functions at group, regional or divisional levels of organizations.
Professionals	Most jobs in this category require bachelor and graduate degrees, and/or professional certification. In some instances, comparable experience may establish a person's qualifications
Technicians	Jobs in this category include activities that require applied scientific skills, usually obtained by post-secondary education of varying lengths, depending on the particular occupation, recognizing that in some instances additional training, certification, or comparable experience is required.
Sales workers	These jobs include non-managerial activities that wholly and primarily involve direct sales.
Administrative support workers	These jobs involve nonmanagerial tasks providing administrative and support assistance, primarily in office settings.
Craft workers	Most jobs in this category includes higher skilled occupations in construction. This category also includes occupations related to the installation, maintenance and part replacement of equipment, machines and tools.
Operatives	Most jobs in this category include intermediate skilled occupations and include workers who operate machines or factory-related processing equipment. This category also includes occupations of generally intermediate skill levels that are concerned with operating and controlling equipment to facilitate the movement of people or materials.
Laborers and helpers	Jobs in this category include workers with more limited skills who require only brief training to perform tasks that require little or no independent judgment.
Service workers	Jobs in this category include food service, cleaning service, personal service, and protective service activities. Skill may be acquired through formal training, job-related training or direct experience.

Note: Adapted from Equal Employment Opportunity Commission (2006, pp. 5-6).

Due to a small number of cases for several job categories, the variable *JobCat* was collapsed into the variable *CollJobCat* as described in Chapter 4.

Respondents were also asked to describe their job tenure in years (*YrsinPos*), their marital status (*Married*), their spouse's intended retirement time if married, using the same age ranges used for the dependent variable (*SpouseRetTime*), their number of dependents (*Dependents*), their retirement plan (*RetPlan*), and their expectation of being covered by health insurance if they should retire before eligible for Medicare (*HealthInsurance*). A four-item index (*RetAdjustIndex*) was used to measure expected adjustment to retirement (Taylor & Shore, 1995). The items were measured on a 5-point Likert-type scale and averaged to form the index. A more detailed description of the development of this and the other indices used in this study is available in Chapter 4.

As faculty tenure (*Tenure*) is a unique arrangement not typically found in other jobs and may influence retirement timing, and since the category "Professionals" may include jobs other than faculty, faculty members were asked to self-identify and indicate whether they have been granted tenure at their current institution.

Data Sampling and Collection

For this study I distributed an electronic survey to virtually the entire population of full-time permanent employees of the Pennsylvania State System of Higher Education (PASSHE). The final sample drew employees from 13 of the 14 universities and the Office of the Chancellor and represented over 13% of that population. One university's Institutional Review Board did not respond to a request for approval for participation on their campus. As a result, all employee addresses for that university were excluded from the email distribution list. Table 5 displays the breakdown of full-time employees for 2007-2008, according to the most recent data that included

detailed categories available from PASSHE (Pennsylvania Department of Education, 2008). The totals for fall of 2010 (Pennsylvania State System of Higher Education, 2011), for which categorical breakdowns were not available, are shown in the far right column. Note that the totals in Table 5 include temporary workers, which have been excluded from the email address pool for this study, as their employment at the institutions would seem less likely to represent a job from which they might actually retire. The totals also exclude wage employees, which were included in the survey distribution list. The survey was distributed to 9,528 email addresses provided by the Office of the Chancellor, which represented the full-time permanent complement of PASSHE employees, excluding the campus that did not participate, as of January of 2013.

Table 5

PASSHE Colleges and Universities Full-Time[a] Fall Staff, 2007 & Fall 2010

Institution	Executive, administrative & managerial	Instructional faculty	Other professional	Non-professional	2007 Totals	2010 Totals
Bloomsburg	33	393	156	350	932	*1,049*
California	37	293	164	260	754	901
Cheyney	23	91	59	120	293	298
Clarion (Main)	33	255	133	214	635	757
East Stroudsburg	36	305	122	235	698	804
Edinboro	35	332	130	239	736	813
Indiana (Main)	70	679	240	518	1,507	1,538
Kutztown	41	421	203	311	976	1,043
Lock Haven (Main)	28	246	96	194	564	592
Mansfield	23	151	93	122	389	465
Millersville	48	317	164	342	871	991
Shippensburg	38	324	144	274	780	880
Slippery Rock	42	353	162	316	873	920
PASSHE Totals	487	4,160	1,866	3,495	10,008	11,051

Note: Adapted from College and University Profiles (Pennsylvania Department of Education, 2008) and the 2010-2011 PASSHE FactBook (Pennsylvania State System of Higher Education, 2011).
[a]Including temporary workers and excluding wage employees.

In addition to the relative ease of access to subjects, the universities offered other potential advantages to this research. As is clear from Table 5, universities employ relatively large numbers of employees in a wide variety of jobs. This allowed this study to assess the

potential relationship between the independent variables and the dependent variables across a broad range of jobs with, presumably, a certain level of diversity in job characteristics. Thus, while the PASSHE schools presented an easily accessible population from which to sample, they were also chosen as a purposive sample (Babbie, 2008) "on the basis of knowledge of a population, its elements, and the purpose of the study" (p. 204). Additionally, it was expected that most university employees would have access to the university email system, which facilitated the distribution and the collection of the survey instrument electronically through Qualtrics© Research Suite (Qualtrics, Provo, UT).

Data Analysis

The data analysis consisted primarily of ordered (or ordinal) logistic regression (Hamilton, 1992; Long & Freese, 2006). This approach allowed for easy assessment of the probabilities for the four possible values of the ordinal dependent variable; intended retirement timing. The multivariate ordered logit regressions were preceded by univariate analysis to ensure proper model specification. The two two-item indexes used to measure physical and financial health and the four-item index used to measure expected adjustment to retirement (Taylor & Shore, 1995) were analyzed for appropriate levels of inter-item reliability. The data collected by the Job Diagnostic Survey (Hackman & Oldham, 1976, 1980) that was intended to represent the levels of the five job characteristics identified by the Job Characteristics Model was subjected to factor analysis, which led to the identification of a two-factor solution that better fit the study sample. The overarching objective of the data analysis was to assess the effect of the independent variables, especially the two identified job characteristic factors, on the probabilities for the four intended retirement age range outcomes.

Ethical Considerations

As the data collection methodology consisted of an electronic survey preserving respondent anonymity and confidentiality was easily accomplished. Survey respondents received a description of the general purpose of the research and were informed that their participation was entirely voluntary. The informed consent letter is available in Appendix B. All respondent identities were coded electronically through the Qualtrics© Research Suite (Qualtrics, Provo, UT), which preserved the anonymity of the individual respondents. While disguising the likely sites from which data was collected was not feasible, given the author's institutional affiliations, individual confidentiality was not threatened as the responses were anonymous. In light of this there appears to be no potential for harm to the institutions or the workforces as a whole given the nature of the data collected and the analyses performed. I was initially granted expedited IRB approval for this research study. However, due to some confusion among the IRBs at the respective locations I went through a more comprehensive process during which each university's IRB had opportunity to consider the proposed human subjects protocol and determine whether or not to approve the study for their population. As noted earlier, one IRB did not respond to information submitted for review and a request for permission to survey individuals in their university. Therefore, I removed all email addresses for that campus from the survey panel prior to distributing the survey.

Method

As noted, I distributed an electronic survey to virtually the entire population of full-time permanent employees of the Pennsylvania State System of Higher Education (PASSHE). The final sample drew employees from 13 of the 14 universities and the Office of the Chancellor.

I distributed the survey, which was developed using the Qualtrics© Research Suite (Qualtrics, Provo, UT), via an invitation email containing a link to the survey to the sample population of 9,528 Pennsylvania System of Higher Education (PASSHE) employees (excluding employees of the non-participating campus) on May 23rd, 2013 at 10:00 AM. I sent a first reminder email to those who had not yet completed the survey on May 29th, 2013 at 1:00 PM. I also sent a second reminder email on June 5th, 2013 at 8:00 AM. I closed the survey on June 18th, 2013 at 10:00 AM. There were 1,588 respondents who started the survey and 1,328 who completed it, which represents a 13.9 % completed response rate. The list, provided by the Office of the Chancellor of the PASSHE system, was to have included only full-time permanent employees. However, 21 respondents self-identified as part-time, and I dropped those cases, as it seems likely that part-time employees may perceive retirement decision-making differently than those who are full-time. As a result, there were 1,307 total cases in the final data file, representing a 13.75% response rate from the entire sample population. The sample size and its parity with the state system population (to be discussed in Chapter 4) suggest I can generalize the results of my analysis from this sample with a reasonable degree of confidence.

CHAPTER FOUR

DATA ANALYSIS

Research Questions and Hypotheses

As described in Chapter 1, the research question for this study is: to what extent do the core job dimension variables of the Job Characteristics Model, or JCM (Hackman & Oldham, 1976, 1980), explain variance in employees' intended retirement timing relative to the normal retirement age as defined by the Social Security Administration (2006)? The core job dimension variables, as defined in the JCM, are: skill variety, task identity, task significance, autonomy, and feedback. The Job Diagnostic Survey (JDS) instrument developed by Hackman and Oldham (1976, 1980) was used to collect respondents' perceptions of the extent to which these variables are present in their jobs. The JCM (Hackman & Oldham, 1976, 1980; Lussier, 2012) suggests that the core job dimensions contribute to critical psychological states (experienced meaningfulness of work, responsibility for work, and knowledge of results), which in turn lead to positive personal and work outcomes (internal work motivation, effective performance, high work satisfaction, and low absenteeism and turnover). This study examined the possibility that the job dimensions might also be related to changes in intended retirement timing.

As originally formulated (Hackman & Oldham, 1976, 1980), the JCM proposes that the Motivating Potential Score (MPS) for a given job may be calculated by averaging the values for the skill variety, task identify, and task significance variables and multiplying that result by the respective values for the autonomy and feedback variables. However, research (Fried & Ferris, 1987) has indicated that a simple summed total of the five core job dimension variables may be a better indicator of the impact of those dimensions on the outcomes predicted by the JCM. Other scholars further suggested (Fried & Ferris, 1987; Hagle & Mitchell, 1992) that the five-factor

solution for the job characteristics identified by the JDS may not hold true for every population. As a result, this study included a factor analysis of the JDS, and employed the resulting factors for this sample as the key independent variables of interest in place of the five job characteristics defined by the JCM. The factor analysis suggested that the five factor solution did not hold true for the study sample, therefore the resulting factors were analyzed separately for their relationship to the dependent variable (intended retirement timing) and I used neither the simple summed nor the original form of the MPS calculation.

The general research hypothesis is that as the levels of the identified (positive) job characteristics factors increase, the probability of intending to retire early, before the normal age range, will decrease. For this study, the age range of 66 to 67 represents normal retirement age, as 66 was the age of eligibility for retirement with full Social Security benefits for those born between 1943 and 1954, after which the age of eligibility gradually increased to 67, which applies to everyone born since 1960 (Social Security Administration, 2006). I also hypothesize that as the job characteristics factors increase, the probability of intending to retire late (after the normal retirement age range) will increase. However, as I employed the more conservative two-tailed test in my analysis, I chose to state my hypotheses in a direction-neutral form. Thus, the two research hypotheses for this study are:

H1: A change in the level of (positive) job characteristic factors identified from the JDS will correlate with a change in the probability of intending to retire *earlier* than the normal retirement age range, as defined by the Social Security Administration (2006) as ages 66 to 67.

H2: A change in the level of (positive) job characteristic factors identified from the JDS will correlate with a change in the probability of intending to retire *later* than the normal retirement age range, as defined by the Social Security Administration (2006) as ages 66 to 67.

Following the discussion of the factor analysis of the JDS, these hypotheses will be expanded to address each identified factor individually.

Description of the Sample/Comparison Variables

Table 6 reports the number of cases from each location and the percentages of those cases relative to the dataset as a whole. I also have reported the percentages for each location's total employees relative to the total of all PASSHE employees (Pennsylvania State System of Higher Education, 2011) It should be noted that the PASSHE totals do not include full-time wage employees but do include temporary salaried employees, while the data file provided by the Office of the Chancellor did include full-time wage employees but did not include temporary employees. Note also that the total for all PASSHE employees (11,051 as of fall 2010) excludes Dixon Center employees, which were not included in the data file used to distribute the survey, and employees of the campus for which permission to survey was not granted.

Table 6

Sample Distribution by Campus Relative to PASSHE Population

Location	Number of responses.	% of responses	% of all[a] PASSHE employees	% of distribution. list
Bloomsburg	105	8.03	9.49	9.28
California	97	7.42	8.15	7.5
Cheyney	23	1.76	2.7	2.53
Clarion	112	8.57	6.85	6.4
East Stroudsburg	53	4.06	7.28	6.81
Edinboro	112	8.57	7.36	7.2
Indiana	218	16.68	13.92	13.69
Kutztown	54	4.13	9.44	9.2
Lock Haven	57	4.36	5.36	5.35
Mansfield	58	4.44	4.21	3.88
Millersville	117	8.95	8.97	9.56
Office of the Chancellor	45	3.44	N/A	1.62
Shippensburg	112	8.57	7.96	8.37
Slippery Rock	144	11.02	8.33	8.56
Total	1,307	100.00		

[a]All PASSHE employees excluding West Chester and Dixon Center. Temporary employees included and wage employees excluded.

The data in Table 6 suggests that the proportions of responses from each location in the data file were in line with the actual proportions of employees at each location relative to the total number of PASSHE employees. Figure 4 compares the distribution percentages relative to all PASSHE employees to the percentage of email addresses in the distribution list and the percentages of the responses for each location.

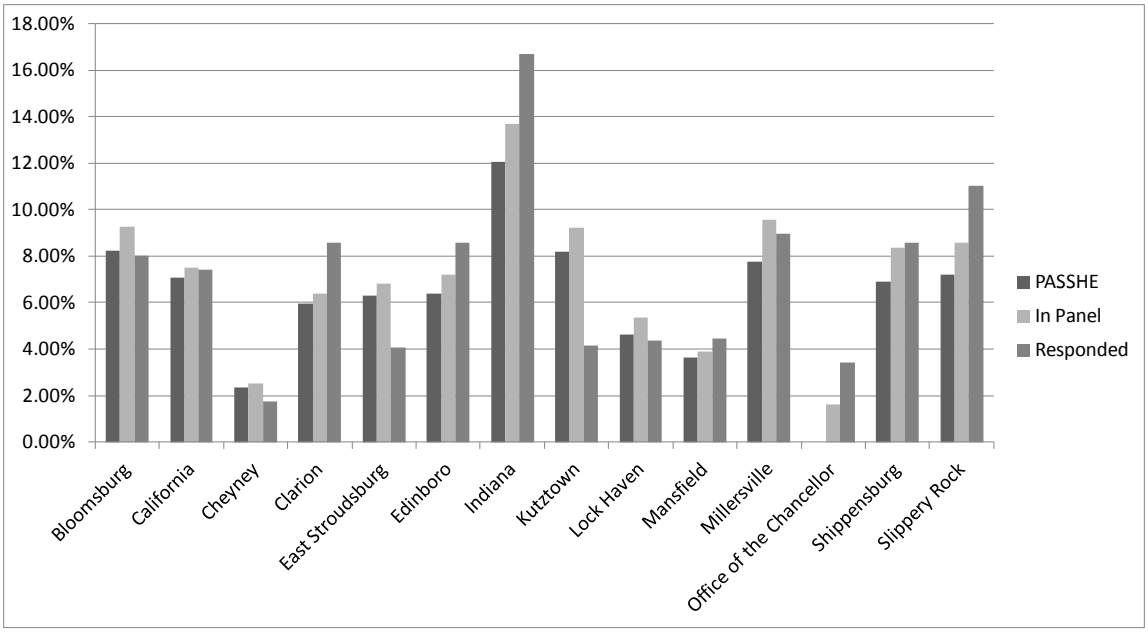

Figure 4. Comparison between PASSHE population, survey distribution list, and responses in sample.

Location (*LocationNUM*)

I created the categorical variable, *LocationNUM*, to code for the respective locations. As respondents were clustered by campus, which might result in some differences by cluster, I decided to include this variable in my analysis to control for those possible differences. However, I did evaluate whether a multi-level mixed effects model with the random component fit better than my final fixed model and there was no significant difference.

Sex (*Female*)

Survey respondents were asked to identify as male or female and this information was stored in the variable *Sex* coded as 1 for male and 0 for female. I decided to reverse that coding and created the dichotomous covariant variable *Female*, which coded the responses as 1 for female and 0 for male. The distribution of responses for this variable are shown in Table 7. As the table indicates, respondents had the option to choose not to respond to this question and 10 individuals so chose. These responses were coded as .m, or missing. Table 7 also includes the percentages reported by PASSHE (Pennsylvania State System of Higher Education, 2011) as of fall of 2010. Note that those percentages include the campus that declined to participate but do not include the Office of the Chancellor. These percentages suggest that the sample's gender distribution is relatively close to that of the population.

Table 7

Distribution of Responses for Variable Female

Gender	Freq.	%	% PASSHE
Male	483	36.95	47.8
Female	814	62.28	52.2
No answer	10	0.77	
Total	1,307	100.00	

Race and Ethnicity (*NotWhite*)

The survey instrument asked respondents to choose their race/ethnicity from the categories established by the EEOC (2006, pp. 4-5). Respondents could also choose not to respond to the question. Responses were saved in the categorical variable *RaceEthn*. As several categories exhibited a small number of responses, I decided to collapse the data into a dichotomous variable named *NotWhite*, with all responses from *RaceEthn* other than White coded as 1 and all White responses coded as 0. Missing responses were coded as .m, or missing. The distribution of the variable *NotWhite* is shown in Table 8. In comparison to data from

PASSHE (Pennsylvania State System of Higher Education, 2011, p. 68), it appears that the sample distribution is roughly in line with the makeup of the larger PASSHE population. Given that less than 10% of the sample is not white, leading to small *n* issues for three of the four categories for the dependent variable, intended retirement timing (*RetTime*), and several empty cells when combined with other covariants, I was unable to include this variable in the final model.

Table 8

Response Distribution for Variable NotWhite

NotWhite	Freq.	Percent	PASSHE %
White	1,147	87.76	85.24
Not White	119	9.10	14.76
.m	41	3.14	
Total	1,307	100.00	

Job Category (*CollJobCat*)

Respondents were asked to identify their job category using categories defined by the EEOC (Equal Employment Opportunity Commission, 2006), as shown in Table 9. Respondents also were asked to self-identify whether they were a member of faculty and whether they were tenured if they were. Responses to the faculty and tenure questions are summarized in Table 10. Five self-identified members of faculty (three non-tenured and two tenured) indicated a job category other than professional or either of the two managerial categories. I decided to re-code these responses as professionals, as the EEOC categories would suggest is appropriate.

Table 9

EEOC Job Categories and Descriptions

Job category	Brief description
Executive/Senior level officials and managers	Individuals who plan, direct and formulate policies, set strategy and provide the overall direction of enterprises/organizations for the development and delivery of products or services, within the parameters approved by boards of directors or other governing bodies.
First/Mid-level officials and managers	Individuals who serve as managers, other than those who serve as Executive/Senior Level Officials and Managers, including those who oversee and direct the delivery of products, services or functions at group, regional or divisional levels of organizations.
Professionals	Most jobs in this category require bachelor and graduate degrees, and/or professional certification. In some instances, comparable experience may establish a person's qualifications
Technicians	Jobs in this category include activities that require applied scientific skills, usually obtained by post-secondary education of varying lengths, depending on the particular occupation, recognizing that in some instances additional training, certification, or comparable experience is required.
Sales workers	These jobs include non-managerial activities that wholly and primarily involve direct sales.
Administrative support workers	These jobs involve nonmanagerial tasks providing administrative and support assistance, primarily in office settings.
Craft workers	Most jobs in this category includes higher skilled occupations in construction. This category also includes occupations related to the installation, maintenance and part replacement of equipment, machines and tools.
Operatives	Most jobs in this category include intermediate skilled occupations and include workers who operate machines or factory-related processing equipment. This category also includes occupations of generally intermediate skill levels that are concerned with operating and controlling equipment to facilitate the movement of people or materials.
Laborers and helpers	Jobs in this category include workers with more limited skills who require only brief training to perform tasks that require little or no independent judgment.
Service workers	Jobs in this category include food service, cleaning service, personal service, and protective service activities. Skill may be acquired through formal training, job-related training or direct experience.

Note. Adapted from Equal Employment Opportunity Commission (2006, pp. 5-6).

Table 10

Summary of Faculty and Tenure Status Responses in Sample

Faculty and tenure status	Freq.	%
Non-Tenured Faculty	95	7.27
Tenured-Faculty	440	33.66
Non-Faculty	772	59.07
Total	1,307	100.00

After reviewing the preceding data I decided to collapse the job categories into the categorical control variable *CollJobCat* to more closely match those identified in the PASSHE FactBook for 2010-2011 (Pennsylvania State System of Higher Education, 2011). Those categories are identified as: Executive, Faculty, Professional, Clerical, Technical, Skilled Crafts, and Service/Maintenance. The collected data was collapsed as follows:

- Executive/Senior Level and First/Mid-Level recoded as Executives and Managers
- Professionals recoded as Professionals (including Faculty, as suggested by the EEOC categories)
- Administrative Support recoded as Administrative Support (corresponding with the PASSHE Clerical category)
- Technicians, Craft Workers, Operatives, Laborers and Helpers, and Service Workers recoded as Collapsed into a single Tech/Craft/Operatives category.

The results of the re-code are shown in Table 11, along with the percentages as reported in the PASSHE FactBook for 2010-2011 (Pennsylvania State System of Higher Education, 2011, p. 82). Note that the PASSHE figures exclude the Office of the Chancellor, which may partially explain the difference in proportion in comparison to the sample. Note also that the data from PASSHE was as of fall 2010, while I collected the sample after the conclusion of the academic year in 2013. The differing time frame may partially explain the lower percentages for both the

Professional category in the sample, which includes Faculty, and the Tech/Craft/Operatives/Labor/Service category.

Table 11

Distribution of Variable CollJobCat

Job categories	Freq.	Percent	PASSHE %
Executives and management	342	26.17	4.53
Professionals (including faculty)	684	52.33	62.42
Administrative support	194	14.84	13.63
Tech/Craft/Operatives/Labor/Service	87	6.66	19.43
Total	1,307	100.00	

Other Variables

In addition to the independent variables described to this point that provide comparisons between the study sample and the population, there are many other control and covariant independent variables for which comparison data is not available.

Marital Status (*Married*)

The literature offers plentiful support for Beehr's (1986) suggestion that marital status may influence retirement timing (Dahl et al., 2003; Flippen & Tienda, 2000; Kubicek et al., 2010; Peracchi & Welch, 1994; Pienta & Hayward, 2002; Ruhm, 1996; Szinovacz, 2006; Szinovacz & DeViney, 2000; Szinovacz et al., 2001). Within the survey, the marital status of the respondent was recorded using the dummy variable Marital, for which not married coded as 0 and married as 1. I later cloned this variable and named the new variable Married to clarify the meaning of the dichotomous values. Table 12 summarizes the data for this covariant variable.

Table 12

Summary of Variable Marital for the Sample

Marital Status	Freq.	%
Not married	343	26.24
Married	932	71.31
No answer	32	2.45
Total	1,307	100.00

Spouse Retirement Timing (*SpouseRetCat*)

As noted in the previous chapter, if respondents indicated that their status was married, they were asked to respond to a question regarding their spouse's intended retirement timing. The answer choices mirrored those used for the dependent variable, *RetTime*, but also included a "not applicable" option. I decided to combine the original variable, *SpouseRetTime* with the variable *Married* to create the new categorical covariant variable *SpouseRetCat* by adding categories for single and not applicable but married to the existing *SpouseRetTime* categories. Table 13 summarizes the original *SpouseRetTime* categorical variable and Table 14 summarizes the created variable *SpouseRetCat*, which combines *SpouseRetTime* and *Married* (see Table 12) into a single categorical variable

Table 13

Summary of Variable SpouseRetTime

Spouse's intended retirement timing (married resp. only)	Freq.	%
Age 61 or earlier	181	13.85
Age 62 to 65	376	28.77
Age 66 to 67	135	10.33
Age 68 or older	126	9.64
Missing	32	2.45
.n	114	8.72
.s	343	26.24
Total	1,307	100.00

Table 14

Summary of Variable SpouseRetCat

Spouse's intended retirement timing categories	Freq.	%
Age 61 or earlier	181	13.85
Age 62 to 65	376	28.77
Age 66 to 67	135	10.33
Age 68 or older	126	9.64
Single	343	26.24
Not applicable but married	114	8.72
Missing	32	2.45
Total	1,307	100.00

Note that the variable *SpouseRetCat* includes 32 missing values, coded as .m and labeled "missing". These are a result of the 32 non-responses to the *Marital* variable in the original survey instrument, which were also missing values in the variable *SpouseRetTime*. Categories 1 through 4 represent the four retirement age ranges used in the dependent variable, *RetTime*. Category 5, coded, labeled "Single", represents single respondents, which were originally handled as missing values in the variable *SpouseRetTime*. Category 6 represents Not Applicable but Married responses to the *SpouseRetTime* original survey instrument item. Thus the new variable, *SpouseRetCat*, provides categories for all spouse retirement time categories, respondents who are not married, respondents who are married but indicated that the question did not apply to their spouse, and missing values for respondents who chose not to respond to the marital status question.

Age (*AgeBEO2013*)

As age is almost certainly related to retirement timing, respondents were asked to provide the year of their birth. From that information, their age by the end of 2013 was calculated and stored in the covariant interval variable *AgeBEO2013*. One case appeared to contain a typographical error for year of birth, as it was entered as "1900", which would make the respondent 113 by the end of 2013. I decided to replace that data point with either the mean or median birth year/age of similar cases, depending on the extent of skew in the sub-sample. There were a total of 43 cases that matched the case in question in terms of sex, marital status, number of dependents, race and ethnicity, job category, and faculty and tenure status. As shown in Table 15, The mean age for the sub-sample was 56.34884 and the median was 58. As demonstrated further by Figure 5, there is, indeed, a slight negative skew. Based on the distribution of age for

the subgroup I decided to change the reported birth year to 1955, which results in an age by end of 2013 of 58.

Table 15

Mean and Median Age of Cases Similar to Case With Birth Year Typographical Error

Variable	Mean	Median	Std. Err.	[95% Conf.	Interval]
AgeBEO2013	56.34884	58	1.348427	53.6276	59.07007
Number of obs= 43					

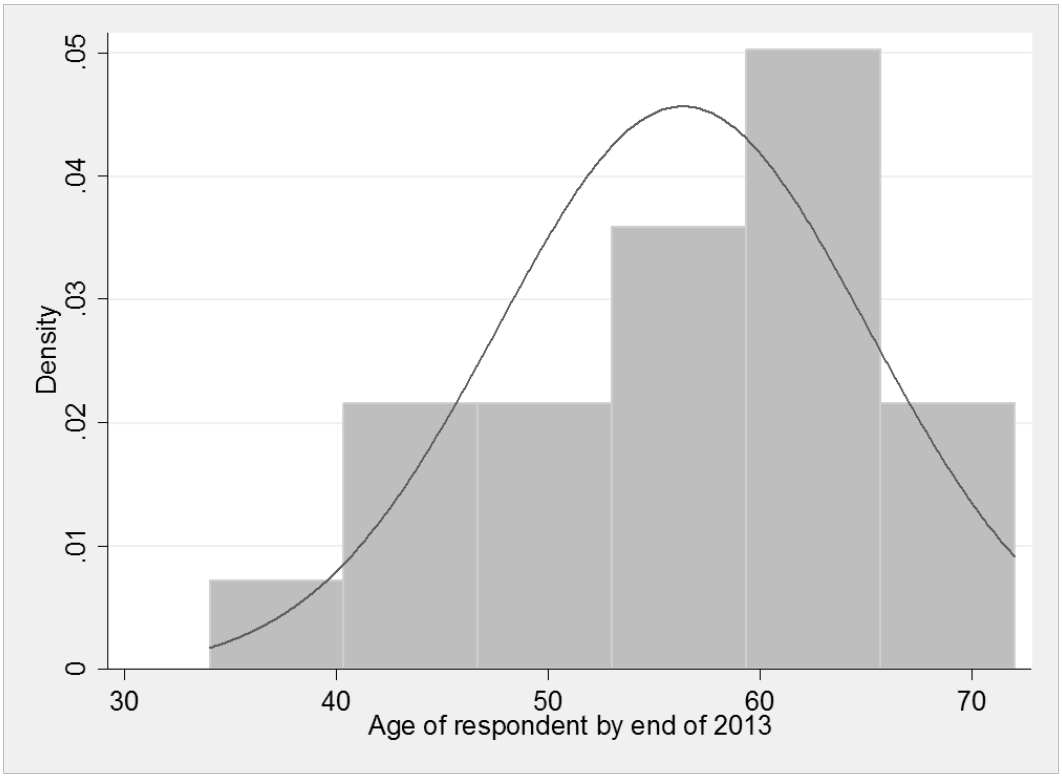

Figure 5. Age distribution for cases matching case with typographical error.

The descriptive statistics for *AgeBEO2013*, after making the change to the case with the typographical error, is shown in Table 16. The distribution diagnostic graphs are presented in Figure 6. While there is some negative skew, due to a few outlier values at the upper end of the age range, I decided to forego transformation and will address it as required after critiquing the

analytical model. I also analyzed the impact of the outlying cases in the model development section of this chapter.

Table 16

Descriptive Statistics for Variable AgeBEO2013 After Fixing Typographical Error

Variable	Mean	Std. Dev.	Min	Max
AgeBEO2013	51.46289	10.1585	24	81
Number of obs= 1307				

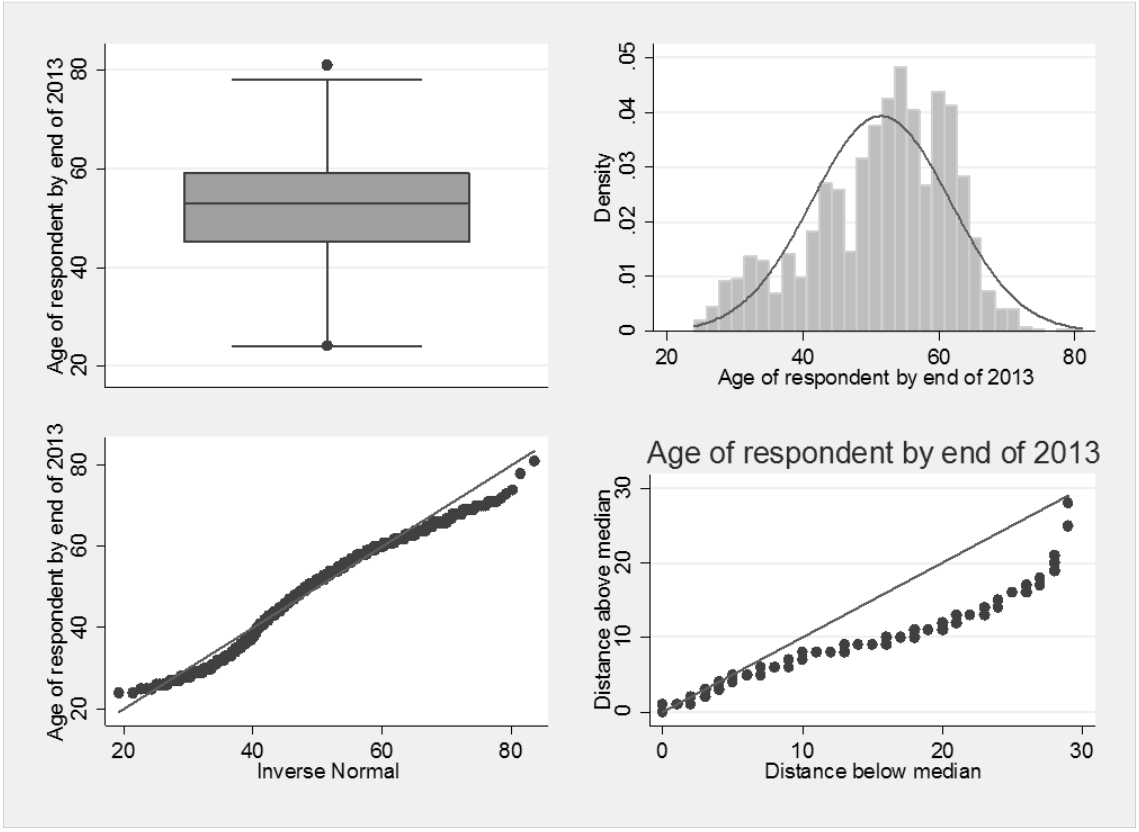

Figure 6. Distribution diagnostic graphs for *AgeBEO2013*.

Dependents (*DependCat*)

Survey data regarding respondents' dependents (*Dependents*) was collected as count data. The text of the survey item was "Other than your partner or spouse, please enter the number of dependents living with you for whom you provided greater than half of their support during the

past year. Enter 0 if you had no dependents other than your partner or spouse." The response distribution for the original variable appears in Table 17. No answer is coded as a missing value (.m).

Table 17

Response Distribution for Variable Dependents

# of dependents other than self & spouse	Freq.	%
0	661	50.57
1	269	20.58
2	246	18.82
3	83	6.35
4	24	1.84
5	7	0.54
6	1	0.08
7	1	0.08
No answer	15	1.15
Total	1,307	100.00

As roughly half of the population reported 0 dependents and responses of 4 or greater exhibited low *n*, I decided to create the categorical control variable *DependCat* with Category 1 representing no dependents, Category 2 representing one to two dependents, and Category 3 representing 3 or more dependents. See Table 18 for the distribution of the collapsed categories:

Table 18

Response Distribution for Variable DependCat

Dependent categories (# other than self & spouse)	Freq.	Percent
No dependents	661	50.57
1 to 2 dependents	515	39.40
3 or more dependents	116	8.88
Missing	15	1.15
Total	1,307	100.00

Years in Current Position (*YrsinPos*)

As years on the job is likely related to retirement timing, respondents were asked to provide the number of years in their current position, which was stored in the interval covariant

variable, *YrsinPos*. The descriptive statistics for this variable are shown in Table 19 and the distribution diagnostic graphs are displayed in Figure 7. Note that respondents were permitted to skip this question and 13 respondents did so, bringing the total observations down to 1,294

Table 19

Descriptive Statistics for Variable YrsinPos

Variable	Mean	Std. Dev.	Min	Max
YrsinPos	12.3493	9.342504	1	46
Number of obs= 1294				

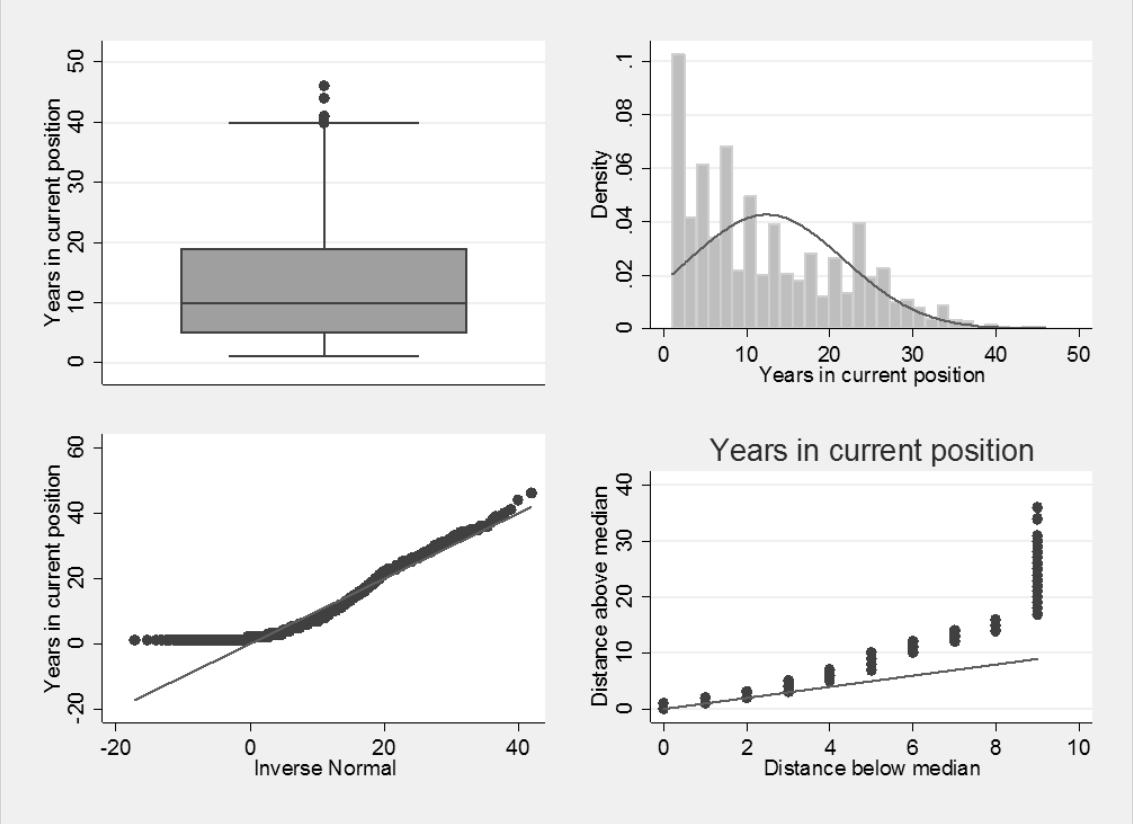

Figure 7. Distribution diagnostic graphs for *YrsinPos.*

I graphically explored transformation options for this variable. The log transformation appeared promising at first. However, decrease in skew and kurtosis were marginal at best. As I could identify no satisfactory power transformation, I left the variable untransformed and addressed it as required after critiquing the analytical model.

Retirement Plan (*DCRetPlan*)

The survey instrument asked respondents to identify their retirement plan (*RetPlan*). The possible responses were two defined benefit plans, State Employee Retirement System (SERS) and Public School Employee Retirement System (PSERS), or a defined contribution Alternative Retirement Plan (ARP, which includes plans administered by Fidelity Investments, ING, TIAA-CREF, or VALIC), or Other plan not listed, and None. As both SERS and PSERS are defined benefit plans, while the ARP category plans are all defined contribution plans, I decided to collapse the data into a dummy control variable named *DCRetPlan*, as shown in Table 20. Note that there were 15 responses to the original question that selected the category other and one response of none. I decided to treat all 16 responses as missing, as there was no reliable way to identify the actual meaning behind the responses of "other." All other responses were coded as 1 if the respondent indicated they had an Alternative Retirement Plan and 0 if they indicated either their plan was either SERS or PSERS.

Table 20

Response Distribution for Variable DCRetPlan

Type of retirement plan	Freq.	%
Defined benefit	634	48.51
Defined contribution	657	50.27
Missing	16	1.22
Total	1,307	100.00

Health Insurance Likelihood (*HealthInsurance*)

The survey included a single 5-point Likert-style item that asked: "What is the likelihood that, if you retired before you qualified for Medicare, you would have health insurance coverage?" The responses were stored in the ordinal control variable *HealthInsurance*. The distribution of responses is shown in Table 21. The descriptive statistics are shown in Table 22 and the distribution diagnostic graphs are shown in Figure 8. While the distribution is slightly not

normal, since the variable is actually ordinal, I decided not to explore a transformation and treated the variable as ordinal, rather than interval-like.

Table 21

Response Distribution for Variable HealthInsurance

Likelihood of health ins. if retired before Medicare eligible	Freq.	%
Extremely unlikely	73	5.59
Unlikely	205	15.68
Neutral	238	18.21
Likely	522	39.94
Extremely likely	269	20.58
Total	1,307	100.00

Table 22

Descriptive Statistics for Variable HealthInsurance

Variable	Mean	Std. Dev.	Min	Max
HealthInsurance	3.542464	1.144396	1	5
Number of obs= 1307				

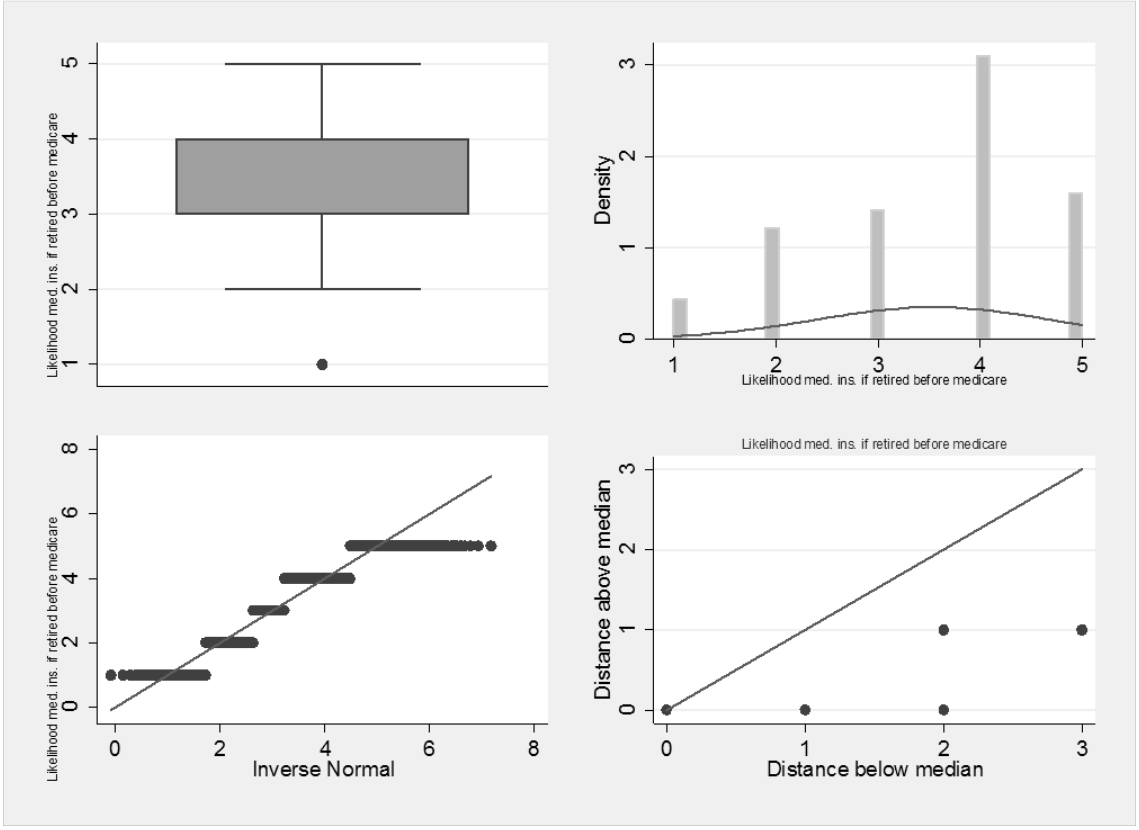

Figure 8. Distribution diagnostics for *HealthInsurance.*

Index Development

I developed several independent variables from multi-item indices. This section describes those variables, their component items, and various other aspects of their development.

Adjustment to Retirement (*RetAdjustIndex*)

The survey instrument included four items intended to assess anticipated adjustment to retirement. These items were based on those used by Taylor and Shore (1995). The items were measured on a 5-point Likert-type scale with categories ranging from strongly disagree to strongly agree, coded as 1 through 5, and included the following questions:

1. I am confident that I will easily adjust to retirement.
2. I don't think that I will have any trouble handling retirement.
3. I expect to enjoy retirement.
4. When I imagine what retirement will be like, I feel depressed. (reverse coded)

The interval control variable *RetAdjustIndex* is calculated by averaging the four index items. Taylor and Shore (1995) reported a Cronbach's alpha score of .86 in their study. For this sample, the alpha was .90, indicating a high level of inter-correlation. Descriptive statistics for this index are shown in Table 23 and the distribution diagnostics graphics are shown in Figure 9. While the distribution is non-normal, I was not able to identify a satisfactory transformation power so left the variable un-transformed.

Table 23

Descriptive Statistics for Variable RetAdjustIndex

Variable	Mean	Std. Dev.	Min	Max
RetadjustIndex	4.058531	.7819985	1	5
Number of obs= 1307				

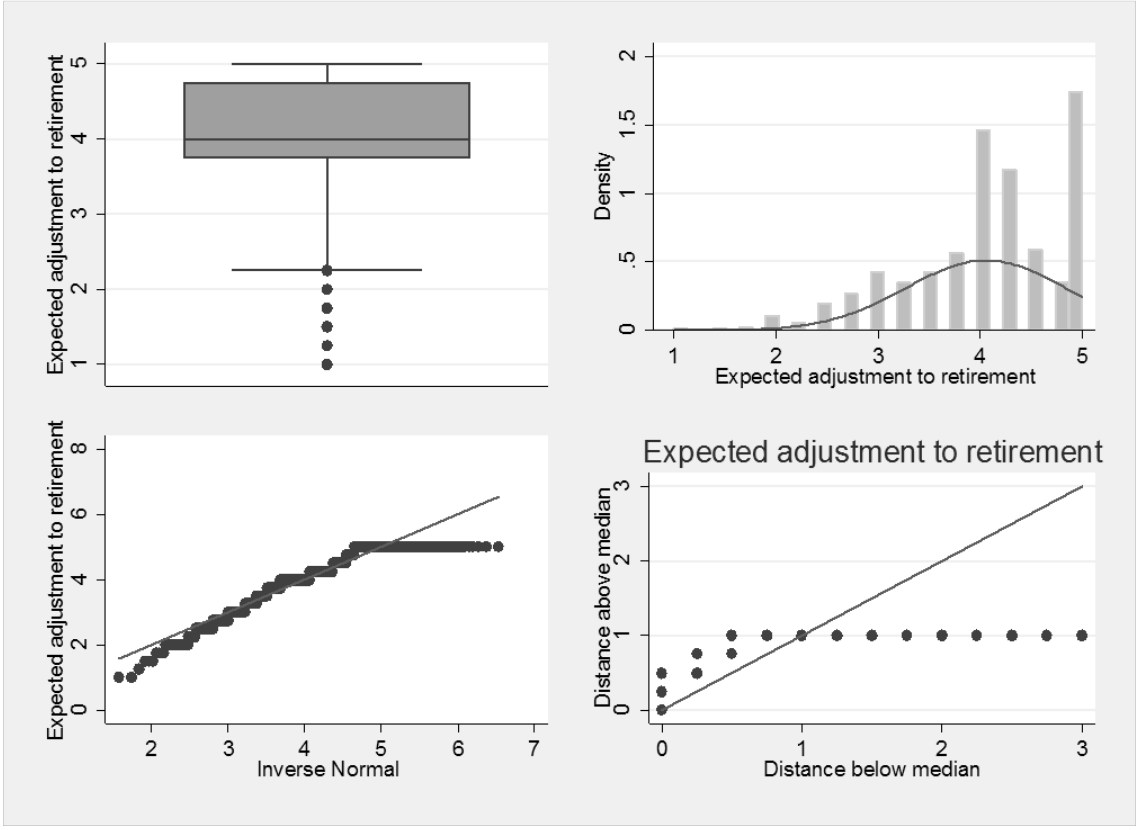

Figure 9. Distribution diagnostics for *RetAdjustIndex.*

Anticipated Financial Health (*FinHealthIndex*)

The interval control variable *FinHealthIndex* is also derived from an index used by Taylor and Shore, (1995) who employed two survey items that asked "respondents whether they expected their pension would be adequate after retirement and whether they believed they would be financially comfortable past retirement" (p. 78). Both questions collected responses on a five-point Likert scale and the two responses were given equal weight by averaging their scores. This study used the same approach, although the first item was re-worded by replacing "pension" with "payouts from retirement plans (e.g., IRA, 401k, 403b, and/or pension) and social security", based loosely on a similar approach used by Beehr et al. (2000) and intended to encourage respondents to consider all likely income stream sources. Cronbach's alpha for this two-item

index in this study is .85, while Taylor and Shore reported a value of .70 for their sample. The descriptive statistics for this variable are shown in Table 24.

Table 24

Descriptive Statistics for Variable FinHealthIndex

Variable	Mean	Std. Dev.	Min	Max
FinHealthIndex	3.341239	.9356424	1	5
Number of obs= 1307				

Anticipated Physical Health (*PhysHealthIndex*)

Anticipated physical health was assessed with two questions, also adapted from Taylor and Shore (1995) that, respectively, asked respondents to rate their overall health and to rate their belief "that their level of health would allow them to work as long as they wished" (p. 78). As was the case in the Taylor and Shore study, both questions used a five-point Likert scale and the two responses were given equal weight by averaging their scores. The result was stored as the interval control variable *PhysHealthIndex.* Taylor and Shore reported an alpha of .67 in their study. The alpha for this sample was .75. The descriptive statistics are displayed in Table 25. I found no satisfactory transformation for this variable, so I left it un-transformed.

Table 25

Descriptive Statistics for Variable PhysHealthIndex

Variable	Mean	Std. Dev.	Min	Max
PhysHealthIndex	3.897475	.724892	1	5
Number of obs= 1307				

Job Characteristics (*MeaningEngage* and *JobControl*)

As noted in Chapter 1, the Job Characteristics Model (JCM) as originally specified described a calculation called the Motivating Potential Score (MPS) as the recommended method for collectively representing the combined influence of the five core job dimensions, as assessed

by the Job Diagnostic Survey (JDS) instrument (Hackman & Oldham, 1976, 1980). However, Fried and Ferris' (1987) meta-analytical study demonstrated strong evidence that a simple summed total of the respective core job dimension scores was "a better predictor of work outcomes than the multiplicative MPS index" (p. 313). Moreover, there is some evidence (Fried & Ferris, 1987) that the five factor solution for the index items derived from the Job Diagnostic Survey (JDS) is not universal but is, instead, moderated by contextual characteristics of the sample in question. Based on these findings, the index items for the individual component scores of the JDS were examined using exploratory factor analysis in order to determine the appropriate factor solution for this sample.

The JDS was designed to measure each of the five core job dimensions using the average of three 7-point Likert-type items per dimension, one of which is reverse coded. Each of the dimensions measured is listed and defined, using Hackman and Oldham's (1980, pp. 78-80) verbatim descriptions, in Table 26 along with the three items from the JDS instrument that make up the index for each dimension.

Table 26

Job Characteristics Model Core Job Dimensions Purportedly Measured by the Job Diagnostic Survey

Core job dimension	Definition	Index items from Sections 1 and 2 of the JDS
Skill Variety	The degree to which a job requires a variety of different activities in carrying out the work, which involve the use of a number of different skills and talents of the person.	JDS1_4 JDS2_1 JDS2_5[a]
Task Identity	The degree to which the job requires completion of a "whole" and identifiable piece of work; that is, doing a job from beginning to end with a visible outcome.	JDS1_3 JDS2_11 JDS2_3 [a]
Task Significance	The degree to which the job has a substantial impact on the lives or work of other people, whether in the immediate organization or in the external environment.	JDS1_5 JDS2_8 JDS2_14 [a]
Autonomy	The degree to which the job provides substantial freedom, independence, and discretion to the individual in scheduling the work and in determining the procedures to be used in carrying it out.	JDS1_2 JDS2_13 JDS2_9 [a]
Feedback	The degree to which carrying out the work activities required by the job results in the individual obtaining direct and clear information about the effectiveness of his or her performance.	JDS1_7 JDS2_4 JDS2_12 [a]

Note. Definitions verbatim from Hackman and Oldham (1980, pp. 78-80). [a]Reverse coded.

In order to check whether the job characteristics index items give a five factor solution for this sample, I performed an exploratory factor analysis on the 15 component measures. As indicated by Table 27 and the scree plot in Figure 10, the analysis suggests that a two factor solution best fits the data.

Table 27

Eigenvalues After Initial Factor Analysis of 15 Component JDS Indices

Factor	Eigenvalue
Factor1	4.09963
Factor2	1.16826
Factor3	0.59538
Factor4	0.49828
Factor5	0.31632
Factor6	0.23608
Factor7	0.00994
Factor8	-0.07113
Factor9	-0.07688
Factor10	-0.13093
Factor11	-0.16180
Factor12	-0.18723
Factor13	-0.21858
Factor14	-0.22243
Factor15	-0.23604

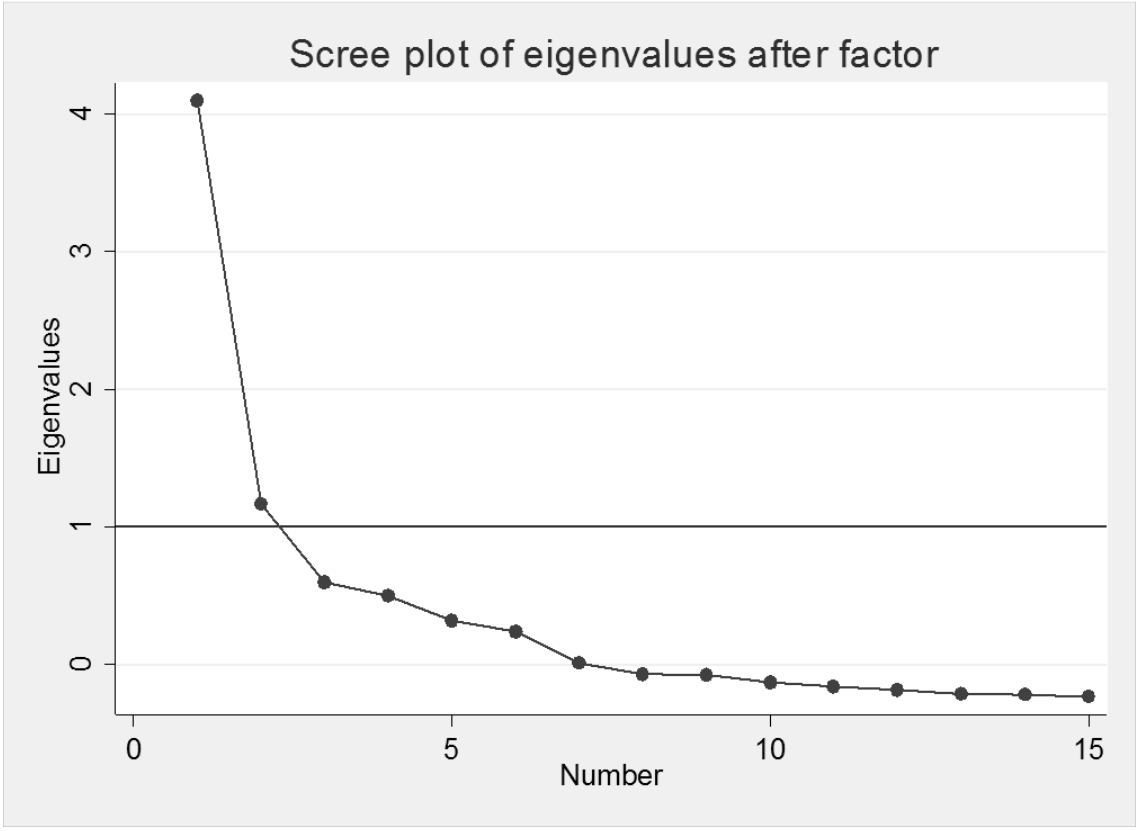

Figure 10. Scree plot for eigenvalues after initial factor analysis of 15 component JDS indices.

Based on the results of the initial factor analysis, I re-ran the analysis retaining only two factors and subjected the results to varimax rotation to simplify the loading patterns. The

resulting factor loadings, uniqueness values, and Cronbach's alpha for each factor are displayed in Table 28 with the loadings for each factor shaded for clarity. The relatively high uniqueness values for several of the variables suggests that they should, potentially, be dropped from the factor on which they load, as a fairly small amount of their variance is explained by the factors as a whole. However, the alpha for both sets of variables is quite high and dropping any of the variables with high uniqueness would actually decrease the alpha. As there is also no theoretical justification for dropping any of these variables, I decided to retain them and used the Stata (StataCorp, 2013) `predict` command to create factor scores for both factors.

Table 28

Factor Loadings for Two Factor Solution After Varimax Rotation

Variable	Factor1 α = 0.81	Factor2 α = 0.74	Uniqueness
JDS1_4	0.5864	0.2097	0.6121
JDS2_1	0.5818	0.1196	0.6472
JDS2_5	-0.5947	-0.0856	0.6390
JDS1_3	0.1382	0.6536	0.5537
JDS2_11	0.0600	0.6474	0.5773
JDS2_3	0.0076	-0.5805	0.6629
JDS1_5	0.6611	0.1357	0.5445
JDS2_8	0.5076	0.0160	0.7421
JDS2_14	-0.5830	-0.0874	0.6525
JDS1_2	0.2966	0.5172	0.6445
JDS2_13	0.3478	0.5036	0.6254
JDS2_9	-0.4258	-0.3275	0.7114
JDS1_7	0.5010	0.3732	0.6097
JDS2_4	0.4123	0.3448	0.7111
JDS2_12	-0.3417	-0.2910	0.7986

Relative to the index item loadings specified by the JDS (Hackman & Oldham, 1976, 1980) originally, Factor 1 and Factor 2 can be described, respectively, as consisting of certain job characteristic dimension index items, as shown in Table 29. Note that the characteristics corresponding to Factor 1 appear to reflect the findings of Fried and Ferris that "skill variety,

task significance, and job autonomy might be part of one dimension because of high possible cross-factor loadings among items of these dimensions" (1987, p. 300)

Table 29

Job Characteristics Corresponding to Each Factor of the Two Factor Solution

	Skill Variety	Task Identity	Task Significance	Autonomy	Feedback
Factor 1	All 3 Items		All 3 Items	1 Item	All 3 Items
Factor 2		All 3 Items		2 Items	

To aid in interpreting the meaning of the two factors, I have listed the key phrases from each item (Hackman & Oldham, 1980, pp. 278-281) loading on the respective factors in Tables 30 and 31. Note that since there is some overlap between the two factors relative to Autonomy, I have listed that job characteristic first for ease of comparison.

Table 30

Key Index Item Phrases for Factor 1

JCM job characteristic	Key phrase from associated index items
Autonomy	"…use my personal initiative or judgment."
Skill Variety	"…do many different things." "…use a number of complex or high-level skills." "…simple and repetitive."[a]
Task Significance	"…significantly affect the lives or well-being of other people." "…a lot of other people can be affected." "…not very significant or important."[a]
Feedback	"…doing the job itself provide you with information about your work performance." "…many chances for me to figure out how well I am doing." "…very few clues about whether or not I am performing well."[a]

Note. Item text excerpted from the Job Diagnostic Survey (JDS) instrument in *Work Redesign* (pp. 278-281) by J.R. Hackman and G.R. Oldham, 1980, Reading, MA: Addison-Wesley. Copyright 1980 by Addison-Wesley. JDS used with permission of the author.

[a]Reverse coded.

Table 31

Key Index Item Phrases for Factor 2

JCM job characteristic	Key phrase from associated index items
Autonomy	"…decide on your own how to go about doing the work."
	"…independence and freedom in how I do the work."
Task Identity	"…is the job a complete piece of work that has an obvious beginning and end."
	"…the chance to completely finish the pieces of work I begin."
	"…do not have the chance to do an entire piece of work from beginning to end."[a]

Note. Item text excerpted from the Job Diagnostic Survey (JDS) instrument in *Work Redesign* (pp. 278-281) by J.R. Hackman and G.R. Oldham, 1980, Reading, MA: Addison-Wesley. Copyright 1980 by Addison-Wesley. JDS used with permission of the author.
[a]Reverse coded.

It seems clear that Factor 1 represents work that is complex (skill variety) and important (task significance), that provides direct confirmation as to how well it was done (feedback), and requires both initiative and judgment (autonomy). As for the feedback element, it is important to note that the JCM originally differentiated between two forms of feedback "feedback from the job itself" and "feedback from agents" (Hackman & Oldham, 1980, p. 304). The feedback assessed by the three survey items that map to Factor 1 purportedly represent the feedback from the job, suggesting that the feedback is an inherent characteristic of the work. Factor 2 appears to represent work that is entirely the responsibility of the worker from beginning to end, rather just a smaller part of a larger process (task identity), and for which the worker determines the processes and procedures (autonomy). There appears to be a clear difference between the autonomy item that loads on Factor 1, which emphasizes a more general right to use one's own "initiative or judgment", and the two items that load on Factor 2, which focus more specifically on how the job is done.

Given the preceding analysis, and considering that the JCM originally described skill variety and task significance (along with task identity) as contributing to a sense of

"meaningfulness", I decided to name Factor 1 *Meaningful Engagement*, and renamed the variable containing the predicted factor scores for Factor 1 as *MeaningEngage*. Jobs that are high in this factor are challenging, due to their complexity, important, require initiative and judgment, and directly communicate success to the worker, which would all suggest a high level of engagement as well as a sense that what the worker is doing is important to others.

Factor 2 clearly encompasses the properties of the task identity dimension, in that three of the survey items loading on this factor refer, in various ways, to the wholeness of the task, as opposed to doing one part of a larger process. As already discussed, the survey items associated with autonomy that load on Factor 2 seem to focus on freedom to choose the methods used to perform the task. Given these characteristics, identifying Factor 2 as *Job Control* seems to be a defensible and logical decision and I renamed the variable containing the predicted factor scores for Factor 2 as *JobControl*.

As a five-factor solution is not valid for this study's sample, neither the original calculation of the Motivating Potential Score (MPS), nor any alternative calculation, can be said to be appropriate for this analysis. Because of that, I examined the *MeaningEngage* and *JobControl* factor score variables independently for any potential relationship to the study's dependent variable.

Growth Need Strength (*GrowthNeedStrength*)

The Job Characteristics Model, as originally specified, identifies the employees' growth need strength (*GrowthNeedStrength*) as a key moderating variable between the core job dimensions, critical psychological states, and positive personal and work outcomes (Hackman & Oldham, 1980). This variable is defined as a measure of "the strength of the respondent's desire to obtain 'growth' satisfactions from his or her work" (Hackman & Oldham, 1975, pp. 162-163).

While the Motivating Potential Score (MPS) is being replaced by the two factors *MeaningEngage* and *JobControl* in this analysis, the model will analyze possible interaction effects between *GrowthNeedStrength* and these factors, following a recommendation in Evans' and Ondrack's research (1991) that interactions between growth need strength and MPS should be explored.

The Growth Needs Strength index was calculated according to the directions for scoring the JDS. Six items from Section 6 were used, each of which was a Likert scale item ranging from 4 to 10. After subtracting 3 from each item, the six scores are averaged and the result stored in the interval variable *GrowthNeedStrength*. The alpha for the six items was 0.91 for this sample. The descriptive statistics for this variable are shown in Table 32 and the distribution diagnostic graphs are shown in Figure 11.

Table 32

Descriptive Statistics for Variable GrowthNeedStrength

Variable	Mean	Std. Dev.	Min	Max
GrowthNeedStrength	6.196634	.9358888	1	7
Number of obs= 1307				

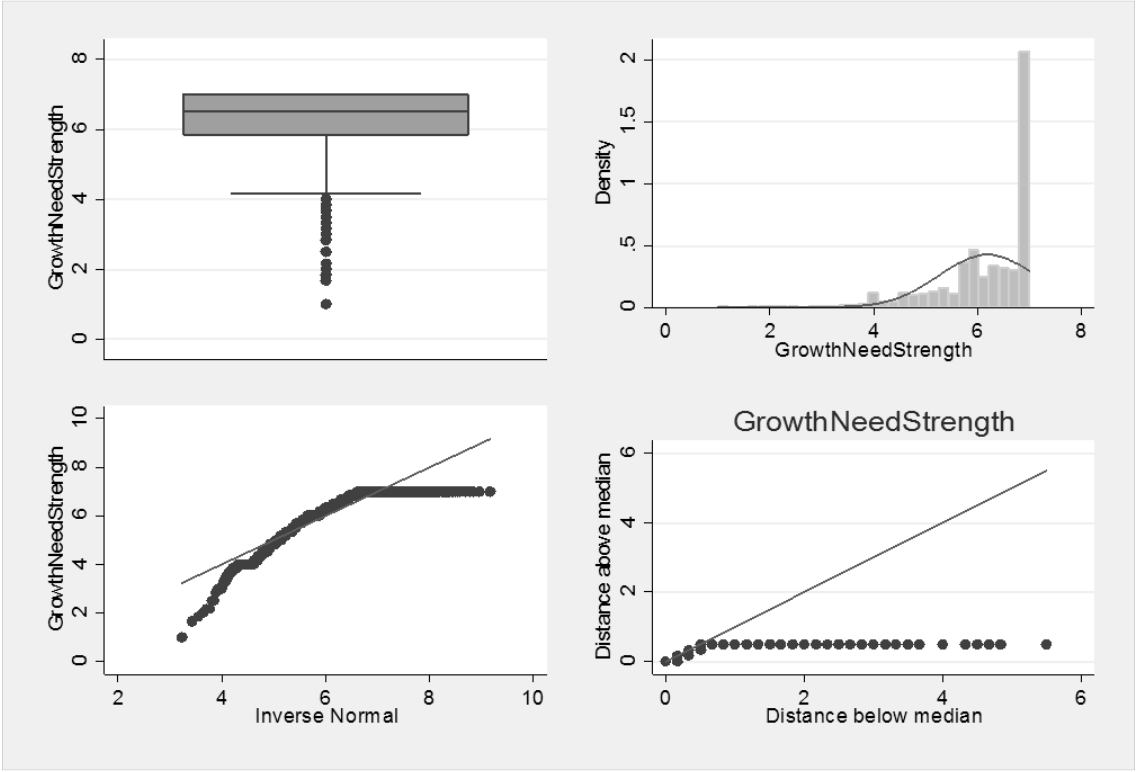

Figure 11. Distribution diagnostics for *GrowthNeedStrength.*

While the distribution of the *GrowthNeedStrength* variable is clearly non-normal I decided to leave it un-transformed as I could identify no satisfactory power transformation.

Dependent Variable: Intended Retirement Timing (*RetTime*)

As noted in Chapter 2, the vast majority of retirement studies tend to treat the expected age of retirement as a continuous variable. One advantage of such approach is access to linear regression models during analysis. However, Ekerdt (2010) noted that "age of transition variables are not truly continuous owing to the pension, tax, and administrative implications of retirement at one age versus another" (p. 72). Because of this, I decided to operationalize intended retirement timing as an ordinal variable (*RetTime*) for the purposes of this study.

As shown in Table 33, respondents were asked to respond to the prompt "I expect to retire at:" and were able to choose from four possible age ranges, the third of which corresponds to normal retirement age (Social Security Administration, 2006), as defined by the Social

Security Administration, for all persons born in 1943 or later. Responses were stored in the ordinal variable, *RetTime*. This is the sole dependent variable for this study. It should be noted that there is one respondent, born in 1932, for whom the normal retirement age (65) would actually correspond to category 2, Age 62 to 65. This should not be problematic in terms of hypothesis testing, as their response to the prompt still makes sense in terms of whether it is before or after normal retirement age.

Table 33

Summary of Variable RetTime

Intended retirement timing for respondent	Freq.	%
Age 61 or earlier	294	22.49
Age 62 to 65	462	35.35
Age 66 to 67	255	19.51
Age 68 or older	296	22.65
Total	1,307	100.00

Interactions

In addition to the variables described to this point, I also analyzed several two- and three-way interactions as part of this study. Each interaction and the theoretical basis for its inclusion in the model is described in the subsections that follow.

GrowthNeedStrength, *MeaningEngage*, and *JobControl*

As noted previously, while the MPS score was replaced by the two factors *MeaningEngage* and JobControl in this analysis, the model analyzed possible interaction effects between GNS and these factors, following a recommended in Evans' and Ondrack's research (1991) that interactions between GNS and MPS should be explored. I examined both the three-way interaction between *GrowthNeedStrength, MeaningEngage,* and *JobControl* and the two way interactions between *GrowthNeedStrength* and *MeaningEnage* and *JobControl*, as described in the model specification section of this chapter.

Female* and *AgeBEO2013

The literature on the work experiences and retirement decisions of men and women as they age suggests that several significant gender differences exist (Dahl et al., 2003; Herzog, House, & Morgan, 1991; Honig, 1996; Szinovacz et al., 2001; Talaga & Beehr, 1995; Windmeijer, 1995). In light of that, I included an interaction term between *Female* and *AgeBEO2013* in the model to check for any possible effect. The results are discussed in the model specification section of this chapter.

DCRetPlan*, *AgeBEO2013*, and *YrsinPos

The nature of the various retirement plans' rules for when a beneficiary can collect full benefits makes it difficult to assess that information for any given respondent. The calculations used by the plan administrators to determine the age of eligibility take into consideration the age of the beneficiary and the number of years for which they have earned credit for their service. While *YrsinPos*, which represents the respondent's tenure in their current position, is not a perfect proxy for years of eligible service, it likely correlates fairly closely for the sample as a whole. By examining the interaction between the type of retirement plan, the age of the respondent, and the number of years in the current position, I hope to have at least approximated the effect on intended retirement timing due to the respondent's proximity to the point in time at which they can receive full benefits. The results of the analysis of this interaction, too, are described in the model specification section.

As noted by Mitchell (2012), it is necessary to include all lower order two-way interactions when including three-way interactions in a model. While there's no good theoretical basis for expecting interactions between *DCRetPlan* and *AgeBEO2013* or *DCRetPlan* and *YrsinPos*, it is logical to include an interaction between *AgeBEO2013* and *YrsinPos*, as it seems

likely that there is a difference in the perceptions of retirement timing between an employee with ten years on the job at the age of 60 compared to one with ten years on the job at the age of 30. The same likely holds true for a 40-year old with 20 years on the job versus a 40-year old with only one year. The results of that two-way interaction are presented in the model specification section.

Variable Summary

A complete listing of the variables that were considered for inclusion in the ordinal regression model is available in Table 34. A correlation table for the variables, including both correlation score and *p* scores, is displayed in Table 35. It suggests that there is no statistically significant correlation between *LocationNUM*, *DependCat*, *CollJobCat*, or *GrowthNeedStrength* and the dependent variable *RetTime.* Each of those variables was included in the initial model in spite of these findings either to ensure control for possible differences (*LocationNum*) or because some category comparisons were actually significant (*CollJobCat*). Those decisions are discussed in detail in the model development section of this chapter.

Table 34

Variables Considered for Inclusion in the Ordinal Regression Model

	Variable name	Type	Notes
Independent variables	LocationNUM	Categorical	Control variable
	SpouseRetCat	Categorical	Covariate
	AgeBEO2013	Interval	Covariate
	Female	Dichotomous	Covariate
	NotWhite	Dichotomous	Covariate
	DependCat	Ordinal	Covariate
	YrsinPos	Interval	Covariate
	CollJobCat	Categorical	Control variable
	DCRetPlan	Dichotomous	Control variable
	HealthInsurance	Ordinal	Control variable
	RetAdjustIndex	Interval	Control variable
	FinHealthIndex	Interval	Control variable
	PhysHealthIndex	Interval	Control variable
	MeaningEngage	Interval	Variable of interest
	JobControl	Interval	Variable of interest
	GrowthNeedStrength	Interval	Moderating variable
Dependent variable	RetTime	Ordinal	

Table 35

Correlation Table for All Variables With Correlation Coefficient and P Scores

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1)	RetTime	1.00									
(2)	LocationNUM	-0.01	1.00								
		(0.69)									
(3)	SpouseRetCat	0.30	-0.00	1.00							
		(0.00)	(1.00)								
(4)	AgeBEO2013	0.17	-0.03	0.10	1.00						
		(0.00)	(0.32)	(0.00)							
(5)	Female	-0.14	0.00	0.02	-0.05	1.00					
		(0.00)	(0.89)	(0.50)	(0.08)						
(6)	NotWhite	0.11	-0.04	0.07	-0.02	-0.00	1.00				
		(0.00)	(0.11)	(0.02)	(0.45)	(0.90)					
(7)	DependCat	0.03	-0.03	-0.16	-0.21	-0.10	0.06	1.00			
		(0.34)	(0.36)	(0.00)	(0.00)	(0.00)	(0.02)				
(8)	YrsinPos	-0.14	-0.05	0.00	0.48	-0.03	-0.08	-0.11	1.00		
		(0.00)	(0.05)	(0.94)	(0.00)	(0.24)	(0.01)	(0.00)			
(9)	CollJobCat	-0.03	0.02	0.01	-0.04	0.14	-0.02	-0.02	0.07	1.00	
		(0.25)	(0.55)	(0.81)	(0.18)	(0.00)	(0.42)	(0.57)	(0.01)		
(10)	DCRetPlan	0.20	-0.02	0.05	0.06	-0.08	0.02	-0.02	0.02	-0.16	1.00
		(0.00)	(0.43)	(0.08)	(0.03)	(0.00)	(0.48)	(0.51)	(0.49)	(0.00)	
(11)	HealthInsurance	-0.28	-0.01	-0.14	0.11	-0.01	-0.03	-0.04	0.25	-0.06	0.01
		(0.00)	(0.60)	(0.00)	(0.00)	(0.73)	(0.35)	(0.19)	(0.00)	(0.05)	(0.69)
(12)	RetAdjustIndex	-0.29	0.02	-0.10	-0.01	0.10	-0.00	0.03	0.03	0.02	-0.02
		(0.00)	(0.44)	(0.00)	(0.69)	(0.00)	(0.96)	(0.32)	(0.22)	(0.50)	(0.56)
(13)	FinHealthIndex	-0.19	0.01	-0.12	0.12	-0.07	-0.09	-0.09	0.19	-0.16	0.01
		(0.00)	(0.81)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.68)
(14)	PhysHealthIndex	-0.00	0.02	-0.03	-0.02	0.08	-0.08	0.04	0.04	-0.08	0.03
		(0.88)	(0.59)	(0.21)	(0.51)	(0.00)	(0.00)	(0.12)	(0.14)	(0.01)	(0.24)
(15)	MeaningEngage	0.09	-0.02	-0.01	0.13	-0.04	0.01	-0.02	0.07	-0.29	0.12
		(0.00)	(0.44)	(0.85)	(0.00)	(0.16)	(0.80)	(0.37)	(0.01)	(0.00)	(0.00)
(16)	JobControl	0.08	-0.01	0.01	0.09	-0.03	0.05	0.03	0.09	-0.05	0.09
		(0.00)	(0.64)	(0.84)	(0.00)	(0.31)	(0.06)	(0.35)	(0.00)	(0.10)	(0.00)
(17)	GrowthNeedStrength	0.07	-0.03	-0.02	0.02	0.15	-0.00	-0.03	-0.03	-0.09	0.05
		(0.01)	(0.21)	(0.48)	(0.47)	(0.00)	(0.98)	(0.27)	(0.30)	(0.00)	(0.05)

		(11)	(12)	(13)	(14)	(15)	(16)	(17)
(11)	HealthInsurance	1.00						
(12)	RetAdjustIndex	0.18	1.00					
		(0.00)						
(13)	FinHealthIndex	0.42	0.22	1.00				
		(0.00)	(0.00)					
(14)	PhysHealthIndex	0.18	0.12	0.25	1.00			
		(0.00)	(0.00)	(0.00)				
(15)	MeaningEngage	0.09	0.04	0.15	0.12	1.00		
		(0.00)	(0.11)	(0.00)	(0.00)			
(16)	JobControl	0.11	0.05	0.16	0.22	0.14	1.00	
		(0.00)	(0.09)	(0.00)	(0.00)	(0.00)		
(17)	GrowthNeedStrength	0.01	0.06	0.05	0.13	0.24	0.17	1.00
		(0.70)	(0.03)	(0.07)	(0.00)	(0.00)	(0.00)	

Model Specification

Initial Model

I began my regression analysis by running an ordinal logistic regression in Stata® (StataCorp, 2013), regressing all independent variables listed in Table 34 on the dependent variable, *RetTime*. The results of that model, shown in Table 36 suggested that several independent variables had a non-significant influence on intended retirement timing for this sample. These variables included *LocationNUM*, with the exception of one location (Mansfield), *Female*, *DependCat*, *PhysHealthIndex*, *MeaningEngage*, *JobControl*, and *GrowthNeedStrength*. I used Stata's `contrasts` command to evaluate the joint effect (Mitchell, 2012) of the collective categories of the two categorical variables, *LocationNUM* and *DependCat*. This command tests the "overall equality of the means for a subset of groups" (2012, p. 178), thus establishing whether or not the comparisons between the groups of a given categorical variable are actually significant. The joint effect for both *LocationNUM* and *DependCat* was not significant, suggesting that both variables could be dropped from the final model. However, as it seems likely that there may be differences between the locations that are not captured by the data collected for this sample, I decided to leave *LocationNUM* in the model to control for those possible differences. I decided to drop *DependCat*, *PhysHealthIndex*, and *GrowthNeedStrength* from the final model. In the case of *DependCat*, I had no strong theoretical evidence that the current number of dependents might influence retirement timing, though I included it as a control variable to check for that relationship. For *PhysHealthIndex,* while physical health as one nears retirement age may have a significant impact on the retirement decision, it seems likely that it has much less of an impact for those for whom the decision is still far off. Given that, and the inherent difficulty in predicting one's future health, it made sense to drop that variable as well.

For *GrowthNeedStrength* (GNS), there is some evidence that it frequently fails to exhibit the a priori moderating effect on motivating potential proposed in the original Job Characteristics Model. While the JCM (Hackman & Oldham, 1976) proposes that GNS will moderate the relationship between the core job dimensions and the personal and work outcomes, several studies (Graen, Scandura, & Graen, 1986) have noted that support for that aspect of the JCM is inconclusive. Graen et. al conclude that cross-sectional studies, such as this one, are particularly ill-suited to reliably detect a relationship between GNS and job characteristics because they cannot capture the "temporal sequence of first stimulus and then reaction" (1986, p. 485) implicit in job characteristic, and other, motivational theories. Given those findings, and the fact that the five factor solution for job characteristics proposed by Hackman and Oldham (Hackman & Oldham, 1976, 1980) did not appear valid for this study's sample, it was not surprising to find that *GrowthNeedStrength* did not have a significant impact on intended retirement timing as either a main effect or as part of an interaction with *MeaningEngage* or *JobControl*. Additionally, the issue may be the dependent variable used in this study. It is possible that GNS does play a moderating role relative to the personal and work outcomes specified by the JCM, but this study examined an outcome, intended retirement timing, not included in the original JCM. Based on that reasoning, I dropped both the *GrowthNeedStrength* variable and the interactions that involved that variable. As *MeaningEngage* and *JobControl* are the independent variables of interest for this study, I decided to leave them in the final model for further evaluation. As the interaction of *Female* with *AgeBEO2013* appears to be significant, I retained the variable *Female*, although its main effects appear not to be significant.

Table 36

Ordinal Regression for Variables Predicting Probability of Intended Retirement Timing. Initial Model

Joint effects for categorical variables with three or more levels						
Variable		df	chi2	p>chi2		
LocationNUM		13	12.40	0.495		
SpouseRetCat***		5	181.49	0.000		
DependCat		2	4.71	0.095		
CollJobCat***		3	17.84	0.001		
HealthInsurance***		4	43.32	0.000		
Other variables and interaction terms						
Variable	Odds ratio	SE	z	p	95%	CI
Age by end 2013	1.057***	0.014	4.038	0.000	1.029	1.086
Female	2.426	1.488	1.445	0.149	0.729	8.071
Not White	1.557*	0.339	2.032	0.042	1.016	2.386
Years current pos.	0.677***	0.033	-7.972	0.000	0.616	0.746
DC Ret. Plan	7.080**	4.646	2.983	0.003	1.956	25.623
Expected adjust. to ret.	0.563***	0.045	-7.139	0.000	0.481	0.659
Expected fin. health in ret.	0.864*	0.065	-1.961	0.050	0.746	1.000
Expected phys. health in ret.	1.101	0.095	1.108	0.268	0.929	1.305
MeaningEngage	1.276	0.583	0.534	0.593	0.521	3.125
JobControl	1.033	0.455	0.074	0.941	0.436	2.451
MeaningEngage # JobControl	0.732	0.368	-0.619	0.536	0.273	1.963
GrowthNeedStrength	1.080	0.078	1.061	0.289	0.937	1.244
MeaningEngage # GrowthNeedStrength	0.994	0.072	-0.079	0.937	0.862	1.146
JobControl # GrowthNeedStrength	1.013	0.071	0.180	0.857	0.883	1.161
MeaningEngage # JobControl # GrowthNeedStrength	1.064	0.085	0.781	0.435	0.910	1.244
Age by end 2013 # Years current pos.	1.006***	0.001	6.581	0.000	1.004	1.007
DC Ret. Plan # Age by end 2013	0.969*	0.014	-2.179	0.029	0.942	0.997
Female # Age by end 2013	0.970**	0.011	-2.593	0.010	0.948	0.993
DC Ret. Plan # Age by end 2013 # Years current pos.	1.001*	0.000	2.355	0.019	1.000	1.001
cut1	-1.302	0.994			-3.250	0.646
cut2	1.123	0.994			-0.826	3.071
cut3	2.515	0.997			0.561	4.469
Number of obs	1201					
LR chi2	736.87					
Prob > chi2	0.0000					
Pseudo R2	0.2267					

Note. Significance levels indicated by * p<0.05, ** p<0.01, *** p<0.001. CI=confidence interval for odds ratios.

Final Model

I ran an ordinal regression with the simplified model, restricting the sample to that of the full model, as dropping *DependCat* otherwise reintroduced cases with missing values for that variable (n = 13). I performed a likelihood ratio (LR) test (Long & Freese, 2006) to evaluate whether the simpler model without the variables *DependCat*, *PhysHealthIndex*, and *GrowthNeedStrength* was significantly different from the full model. The result of the test (likelihood chi^2 = 10.16, degrees of freedom = 8, and p = 0.2539) indicated that the simpler model was not statistically different from the full model that included the dropped variables. Running the simplified model, including the 13 additional cases due to dropping *DependCat*, indicated that *NotWhite* had dropped out of significance at the 95% confidence level (z = 1.78, p = 0.076). As discussed previously, this variable was already identified as being problematic due to small n issues for three of the four dependent variable (*RetTime*) categories, and several empty cells when combined with other covariants. As a result, I also dropped *NotWhite* and re-ran the regression. An LR test of the final model versus the model that included *NotWhite*, restricting the final model to the same sample as dropping *NotWhite* introduced cases with missing values for that variable (n = 41), indicated that the final model without *NotWhite* was not statistically different from the model that included that variable. The final model is shown in Table 37.

Table 37

Ordinal Regression for Variables Predicting Probability of Intended Retirement Timing. Final Model

Joint effects for categorical variables with three or more levels						
Variable		df.	chi2	p>chi2		
LocationNUM		13	16.00	0.249		
SpouseRetCat***		5	199.87	0.000		
CollJobCat***		3	21.62	0.000		
HealthInsurance***		4	39.14	0.000		
Other variables and interaction terms						
Variable	Odds ratio.	SE.	z	p	95%	CI
Age by end 2013	1.056***	0.014	4.077	0.000	1.029	1.084
Female	2.272	1.361	1.370	0.171	0.702	7.352
Years current pos.	0.687***	0.032	-8.057	0.000	0.627	0.752
DC Ret. Plan	7.352**	4.727	3.103	0.002	2.085	25.924
Expected adjust. to ret.	0.574***	0.045	-7.093	0.000	0.492	0.669
Expected fin. health in ret.	0.842*	0.060	-2.408	0.016	0.732	0.969
MeaningEngage	1.248**	0.088	3.157	0.002	1.088	1.433
JobControl	1.192**	0.080	2.610	0.009	1.045	1.361
Age by end 2013 # Years current pos.	1.005***	0.001	6.531	0.000	1.004	1.007
DC Ret. Plan # Age by end 2013	0.967*	0.014	-2.384	0.017	0.941	0.994
Female # Age by end 2013	0.971*	0.011	-2.526	0.012	0.950	0.994
DC Ret. Plan # Age by end 2013 # Years current pos.	1.001**	0.000	2.685	0.007	1.000	1.001
cut1	-2.350	0.826			-3.968	-0.731
cut2	0.068	0.823			-1.545	1.681
cut3	1.464	0.824			-0.152	3.079
Number of obs	1246					
LR chi2	761.13					
Prob > chi2	0.0000					
Pseudo R2	0.2256					

Note. Significance levels indicated by * p<0.05, ** p<0.01, *** p<0.001. CI=confidence interval for odds ratios.

Initial Interpretation

The odds ratios reported in the final model in Table 37 suggest that the hypotheses tested by this study may be supported. In simplified terms, a significant odds ratio greater than one indicates an increase in the odds of intending to retire at a point that is later than the earliest category, which is age 61 or earlier. An odds ratio greater than one could also be interpreted to

mean that the odds of retiring at the latest age range, after age 68, are greater than the odds of retiring at any earlier age. A significant odds ratio less than one indicates a decrease in the odds of intending to retire at any later point in time compared to the earliest range or, conversely, that the odds of retiring at the latest point are less than the odds of retiring at any earlier age. The odds ratio for *MeaningEngage*, at 1.248 ($SE = 0.088$, $z = 3.157$, $p = 0.002$), and the odds ratio for *JobControl,* at 1.192 ($SE = 0.08$, $z = 2.61$, $p = 0.009$) suggest that both job characteristic factors have a positive relationship with the intent to retire at later points in time. Before formally testing the proposed hypotheses and interpreting the model further, I first tested the model to ensure that it met the assumptions of ordinal logistic regression. I then tested for multicollinearity, possible model misspecification, evaluated the fit of the model, and performed outlier analysis. I also explored whether possible problems with the model required the use of robust errors.

Model Criticism

Proportional Odds Assumption

Ordinal logistic regression is subject to the proportional odds (or parallel regression) assumption, which holds that the relationship between groups of an ordinal outcome variable are the same, regardless of which groups are being compared (UCLA Statistical Consulting Group, 2014). Using the *RetTime* dependent variable from this study as an example, if the odds of intending to retire before age 62 are twice as great as the odds of intending to retire at any of the later ages, then the odds of intending to retire between age 62 and 65 is also twice as great as the odds of intending to retire at any of the ages older than that. In other words, the odds between any given comparison between levels are proportional to all the other possible comparisons. As noted by Long and Freese (2006), it is not uncommon for this assumption to be violated and, when it is, the ordinal logistic model may not be the appropriate statistical model to use for that

data. I used two tests recommended by Long and Freese to check whether the assumption holds for this study. As neither test supports the use of factor variables or interaction terms, for the purposes of these tests I treated the factor variables as if they were continuous variables and created new variables that were equivalent to the interactions formed in the model through the use of the # operator. In order to test the model as a whole, Long and Freese recommend the use of the user-written Stata command `omodel` (Wolfe & Gould, 1998), which performs a likelihood ratio test of whether the assumption of proportional odds has been violated. The tests results (LR chi2 = 38.02, df = 32, p = 0.2140) suggest that we fail to reject the null hypothesis that the odds are proportional. In order to test individual model variables, Long and Freese (2006) recommend the user-written `brant` command, which performs a test designed by Brant (1990) to test the proportional odds assumption for each variable in the model. I used the `brant` command to test the variables in the model. The results are in Table 38. According to the results, the only problematic variable is *HealthInsurance* (chi2 = 6.01, df = 2, p = 0.050), but the model as a whole does not appear to violate the assumption (chi2 = 37.4, df = 32, p = 0.235). The issue with *HealthInsurance* could be due to the necessity of treating an ordinal variable as continuous in order to run the test. Given that both tests suggest a failure to reject the null hypothesis that the odds are proportional for the model as a whole and that all interaction terms and variables, with the exception of *HealthInsurance*, do not appear to violate the assumption, I decided to continue the analysis using ordinal logistic regression.

Table 38

Brant Test of Parallel Regression Assumption

Variable	chi2	p>chi2	df
All	37.40	0.235	32
LocationNUM	0.71	0.295	2
SpouseRetCat	2.44	0.295	2
AgeBEO2013	1.38	0.502	2
Female	0.61	0.736	2
YrsinPos	1.79	0.408	2
CollJobCat	1.12	0.571	2
DCRetPlan	3.02	0.221	2
HealthInsurence	6.01	0.050	2
RetAdjustIndex	1.16	0.561	2
FinHealthIndex	2.11	0.348	2
MeaningEngage	4.22	0.121	2
JobControl	4.75	0.093	2
AxY	1.51	0.471	2
DCxA	2.24	0.326	2
FxA	0.45	0.798	2
DCxAxY	2.29	0.318	2

Note: The model interactions are represented by the following variables
AxY represents the interaction AgeBEO2013#YrsinPos
DCxA represents the interaction DCRetPlan#AgeBEO2013
FxA represents the interaction Female#AgeBEO2013
DCxAxY represents the interaction DCRetPlan#AgeBEO2013#YrsinPos.

Test for Multicollinearity

In order to check for multicollinearity in the model, I ran it as if it was an ordinary least squares regression model(Hamilton, 1992), with the factor variables treated as continuous and with individual variables representing the interaction terms in the model. In this way the procedure was similar to that used to run the `omodel` and `brant` commands. After running the model in this fashion, I assessed the variance inflation factor (VIF) for each variable, which provides a measure of multicollinearity by assessing the extent to which any one variable impacts the variance of the model as a whole. As shown in Table 39, the VIF for the four interaction terms (AxY, DCxA, FxA, and DCxAxY) and the variables involved in interactions (YrsinPos, DCRetPlan, Female, and AgeBEO2013) are a good bit higher than one, which would normally suggest the presence of multicollinearity in the model. Generally, multicollinearity

causes an increase in the standard errors of the collinear variables, which impacts the ability to accurately assess their respective coefficients (Hamilton, 1992). A common technique to address this problem is to center the variables involved, typically through a transformation that subtracts the variable's mean from its original values (Afshartous & Preston, 2011). However, Afshartous and Preston note that the addition of interaction terms to a model does not actually introduce multicollinearity and apparent changes to coefficients and standard errors reflects a changed parameterization of the involved variables from those present in a model without the interaction terms. Moreover, they explain that the apparent multicollinearity that results from the inclusion of interaction terms does not actually reduce the statistical power of the model and that the estimates are the same whether drawn from the original model or one in which a centering transformation has been employed. Considering their perspectives on the issue, and given that the analysis in this study is focused on the predicted probabilities derived from the model, rather than interpreting the individual variable coefficients or odds ratios, I determined that the apparent multicollinearity was not an issue and chose not to employ the centering transformation.

Table 39

Variance Inflation Factor Test of Multicollinearity

Variable	VIF	1/VIF
AxY	54.22	0.018444
YrsinPos	46.73	0.021399
DCxA	43.54	0.022966
DCRetPlan	31.86	0.031387
FxA	27.86	0.035896
Female	26.88	0.037201
AgeBEO2013	5.81	0.172059
DCxAxY	4.81	0.207945
FinHealthIndex	1.34	0.747206
HealthInsurance	1.29	0.773448
CollJobCat	1.17	0.855837
MeaningEngage	1.14	0.873975
RetAdjustIndex	1.10	0.907332
SpouseRetCat	1.07	0.934001
JobControl	1.06	0.943031
LocationNUM	1.01	0.994221
Mean VIF	15.68	

Test for Model Specification

I tested the final model for misspecification with the `linktest` command, which regresses both the predicted values of the model (_hat) and a squared term of those values (_hatsq) on the dependent variable (Chen, Ender, Mitchell M., & Wells, 2014). The theory behind this test is that the predicted values will be significant and the squared term will not be significant if the model is properly specified, suggesting that there aren't any missing variables. If the squared term is significant, it is typically an indication that the model is missing one or more independent variables. The `linktest` suggested the final model was properly specified (_hat: p = 0.000 _hatsq: p = 0.113).

Model Fit

To evaluate the fit of the model, I ran the user-written command `fitstat` (Long & Freese, 2006), which provides several measures of model fit. The results for the command are in Table 40. McFadden's R^2 is the value reported as Pseudo R^2 in the Stata ologit regression output shown in Table 37. As the name suggests, Pseudo R^2 should not be considered to be equivalent to the R^2 reported for a linear regression. J.S. Long and Freese (2006) cite two studies (Hagle & Mitchell, 1992; Windmeijer, 1995) that suggest that the McKelvey & Zavoina's R^2, which is 0.506 for this model, is, for ordinal models, the likely near equivalent of the R^2 measure of explained variance for linear models. Long and Freese explain that this measure "most closely approximates the R^2 obtained by fitting the linear regression model on the underlying latent variable" (2006, p. 196). Thus it appears the final model explains approximately half of the variance in the dependent variable.

Table 40

Measures of Fit for ologit of RetTime

Log-Likelihood Intercept Only:	-1687.158	Log-Likelihood Full Model:	-1306.594
D(1206):	2613.189	LR(37):	761.128
		Prob > LR:	0.000
McFadden's R2:	0.226	McFadden's Adj R2:	0.202
ML (Cox-Snell) R2:	0.457	Cragg-Uhler(Nagelkerke) R2:	0.490
McKelvey & Zavoina's R2:	0.506		
Variance of y*:	6.654	Variance of error:	3.290
Count R2:	0.527	Adj Count R2:	0.260
AIC:	2.161	AIC*n:	2693.189
BIC:	-5982.810	BIC':	-497.403
BIC used by Stata:	2898.297	AIC used by Stata:	2693.189

Outlier Analysis

Following a method recommended by Hosmer and Lemeshow (2000), as described by Long and Freese (2006), I began the outlier analysis by first generating "J-1 cumulative probabilities" (2006, p. 200) for my dependent variable, *RetTime*. Thus, I generated *RetTimelt2* for all observations where *RetTime* was less than 2. I also created *RetTimelt3* and *RetTimelt4* in the same manner. I then ran a logit regression on each of the three new binary outcomes, predicted the residuals for each, and created the two-way scatterplots shown in Figure 12.

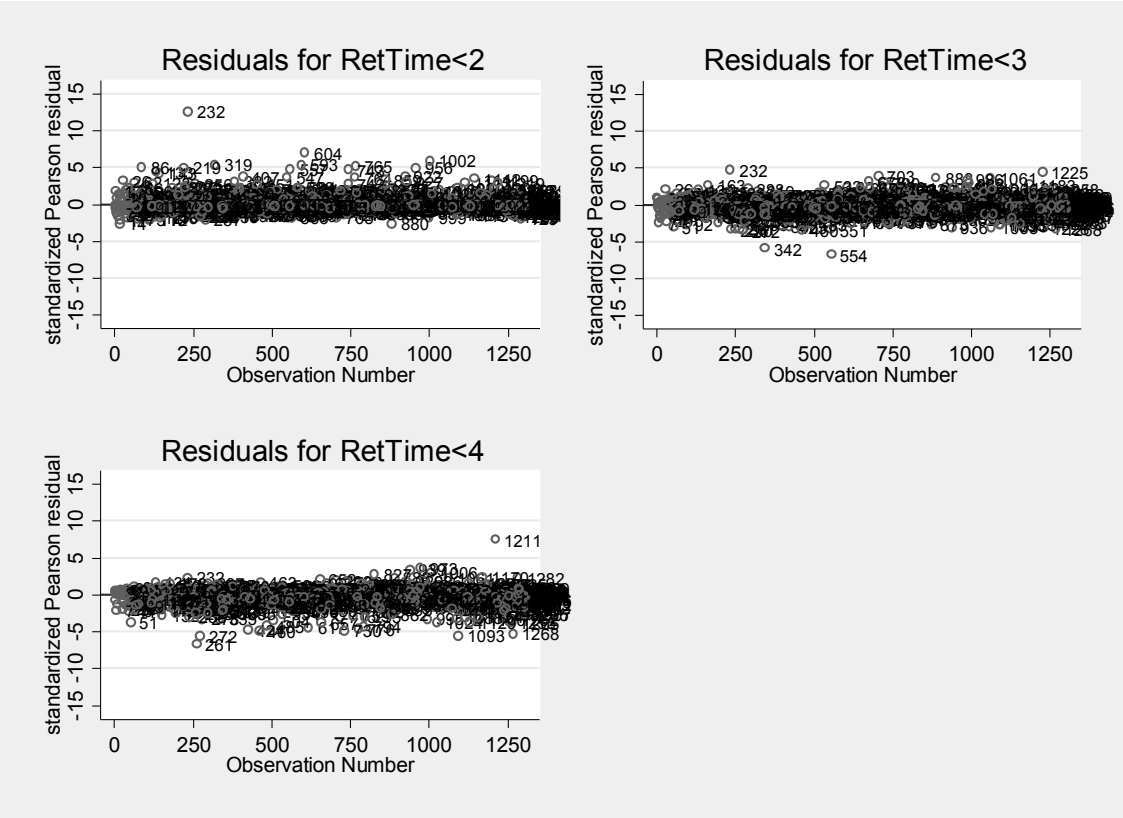

Figure 12. Residual scatterplots for *RetTimelt2*, *RetTimelt3*, and *RetTimelt4*.

As the plots demonstrate, only cases 232, 554, and 1211 appear to have the potential for exerting leverage. To check their influence, I re-ran the regression without those cases. The Pseudo R2 with the cases was .2256, while without them it increased to .2319, a change of only .0063. Additionally, an examination of the three cases provided no theoretical basis for dropping them from the sample, as they did not appear unusual in any one or combination of variables. As a result, I left the outliers in the sample.

Robust Error Analysis

As there is some indication that the model may violate the parallel regression assumption, I next ran the model with the robust errors option. This option uses what are called sandwich standard errors (Long & Freese, 2006) to attempt to correct for possible incorrect model specification, which would include violations of the parallel regression assumption. By

substituting these more "robust" errors, the reported standard errors of the misspecified model should, ideally, be more accurate.

The results of the regression both with normal standard errors and with robust standard errors (displaying only the standard errors for each) are located in Appendix C. The differences in the standard errors resulting from the use of sandwich estimators were all minimal. This would seem to indicate that any model misspecification is quite minor, as was suggested when I ran the `brant` test (Brant, 1990), which tested each variable in the model for potential violation of the parallel regression assumption. As a result, I continued working with the normal standard errors ologit model.

Hypothesis Testing

As noted previously, the original hypotheses for this study were as follows:

H1: A change in the level of (positive) job characteristic factors identified from the JDS will correlate with a change in the probability of intending to retire *earlier* than the normal retirement age range, as defined by the Social Security Administration (2006) as ages 66 to 67.

H2: A change in the level of (positive) job characteristic factors identified from the JDS will correlate with a change in the probability of intending to retire *later* than the normal retirement age range, as defined by the Social Security Administration (2006) as ages 66 to 67.

As the factor analysis of the JDS identified a two-factor solution for this sample, the original hypotheses needed to be expanded to address the factors, *MeaningEngage* and *JobControl* separately. I continued to use the direction-neutral form for each hypothesis as I employed the more conservative two-tailed test in my analysis. Thus, the final hypotheses to be tested are as follows:

H1a: A change in the level of the job's meaningful engagement (the *MeaningEngage* factor) will correlate with a change in the probability of intending to retire *earlier* than normal retirement age, as defined by the Social Security Administration.

H1b: A change in the level of control over one's work (the *JobControl* factor) will correlate with a change in the probability of intending to retire *earlier* than normal retirement age, as defined by the Social Security Administration.

H2a: A change in the level of the *MeaningEnage* factor will correlate with a change in the probability of intending to retire *later* than normal retirement age, as defined by the Social Security Administration.

H2b: A change in the level of the *JobControl* factor will correlate with a change in the probability of intending to retire *later* than normal retirement age, as defined by the Social Security Administration.

The odds ratios for the *MeaningEngage* and *JobControl* job characteristics factors are shown in Table 41. As the table indicates, both factors are significant at the 99% confidence level and the odds ratio for each is greater than one. In terms of the odds ratio, with every one unit increase in the *MeaningEngage* factor score, the odds of intending to retire at the latest point, age 68 or older, versus all of the earlier points, are 1.248 time greater, or approximately 25% higher, all other things being equal. For a one unit increase in the *JobControl* factor score, the odds of intending to retire at the latest point are 1.192 greater, or approximately 19% higher, again, with all other things being equal. These findings support both hypothesis H2a and H2b. The parallel regression, or proportional odds assumption (Long & Freese, 2006) means that the odds also make sense if we start at the earliest point and compare it to all the later points. In other words, we can also say that, for a 1 unit change in *MeaningEngage*, the odds of intending

to retire at age 61 or earlier, are 1.248 times, or approximately 25% less than the odds of intending to retire at any of the later points, all other things being equal. For *JobControl*, a one unit increase corresponds with odds of intending to retire at age 61 or earlier that are 1.192 times, or approximately 19% less than the odds of intending to retire at any of the later points. Thus, hypotheses H1a and H2b are supported by the data. However, the evidence is far more convincing looking at some actual probabilities, both numerically and graphically.

Table 41

Odds Ratios for Job Characteristic Factors MeaningEngage and JobControl

Factor	Odds ratio	z	P>|z|
MeaningEngage	1.248**	2.954	0.003
JobControl	1.192**	2.573	0.010

Note. **p<0.01.

I used the `margins` command to calculate the change in probabilities for each outcome of the dependent variable, *RetTime*, as the two respective job characteristics variables changed. Table 42 shows the change in probabilities for each intended retirement age range as *MeaningEngage* ranges from its minimum value to its maximum while all other variables are dealt with by calculating their average marginal effects (Williams, 2012). When margins are calculated using the default average marginal effects option, the predicted probabilities are calculated for each observation, using the set values for specified variables, which was the two respective job characteristic factors in this case, and the actual values observed for all other variables. The calculated probabilities for each case, using the set and actual values, are then averaged to calculate the average marginal effects. Table 43 shows the change in probabilities for each intended retirement age range as *JobControl* ranges from its minimum value to its maximum while all other variables are dealt with by calculating their average marginal effects. In both cases, the probability of intending to retire at age 61 or earlier decreases by a large

amount as the factors move from their minimum to their maximum values. The probabilities of intending to retire between age 62 and 65 decrease slightly, the probabilities of intending to retire between age 66 and 67 increase slightly, and the probabilities of intending to retire after age 68 increase greatly. Generally the same data is presented graphically in Figure 13, for *MeaningEngage*, and Figure 14 for *JobControl*. However, for those graphs the factors are allowed to move from their min to their max in steps of 0.05, which reveals the slight curves in their relationship to the RetTime outcome probabilities. These results, again, support hypotheses H1a, H1b, H2a, and H2b.

Table 42

Predicted Margins for RetTime at Minimum and Maximum Values of MeaningEngage

	MeaningEngage	
RetTime	Min (-4.745811)	Max (1.842576)
Age 61 or earlier	37.14%	17.65%
Between Age 62 and 65	36.65%	34.79%
Between Age 66 and 67	13.93%	20.53%
After Age 68	12.27%	27.03%

Table 43

Predicted Margins for RetTime at Minimum and Maximum Values of JobControl

	JobControl	
RetTime	Min (-4.177369)	Max (1.620653)
Age 61 or earlier	32.35%	19.05%
Between Age 62 and 65	37.22%	35.30%
Between Age 66 and 67	15.58%	20.10%
After Age 68	14.85%	25.55%

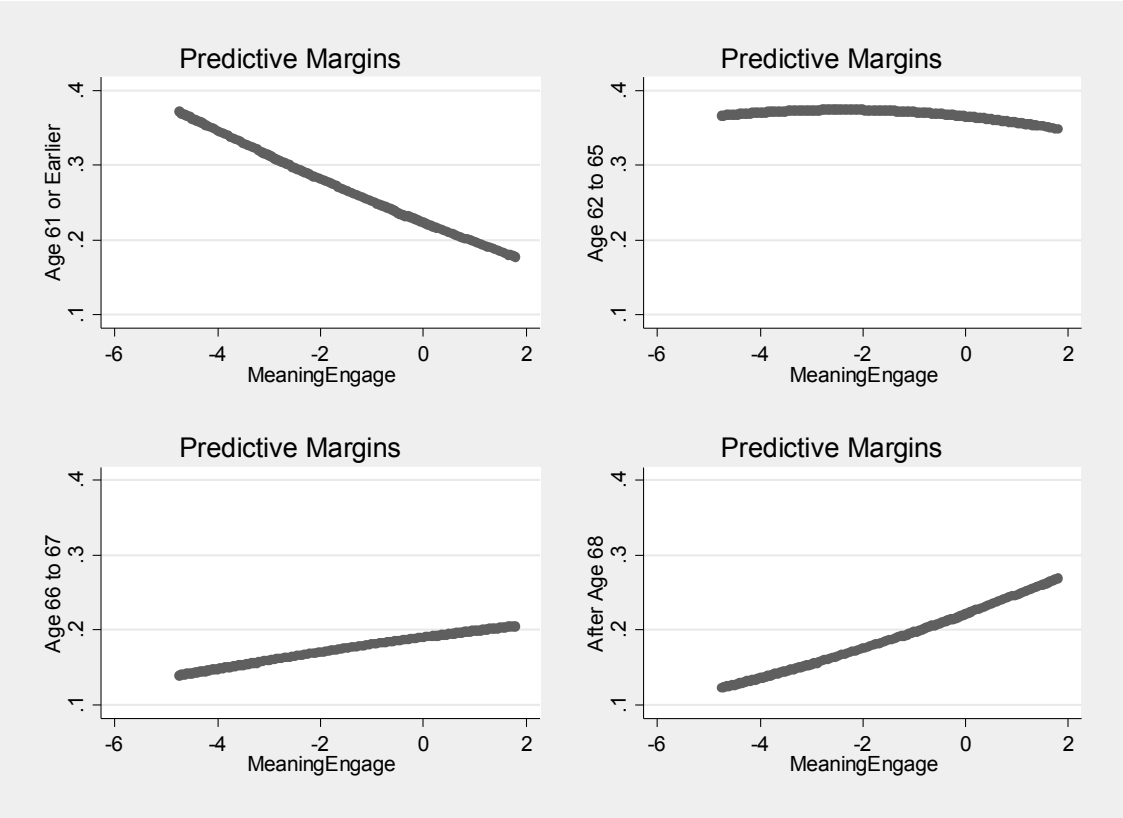

Figure 13. Predicted margins for *RetTime* outcomes over range of values for *MeaningEngage.*

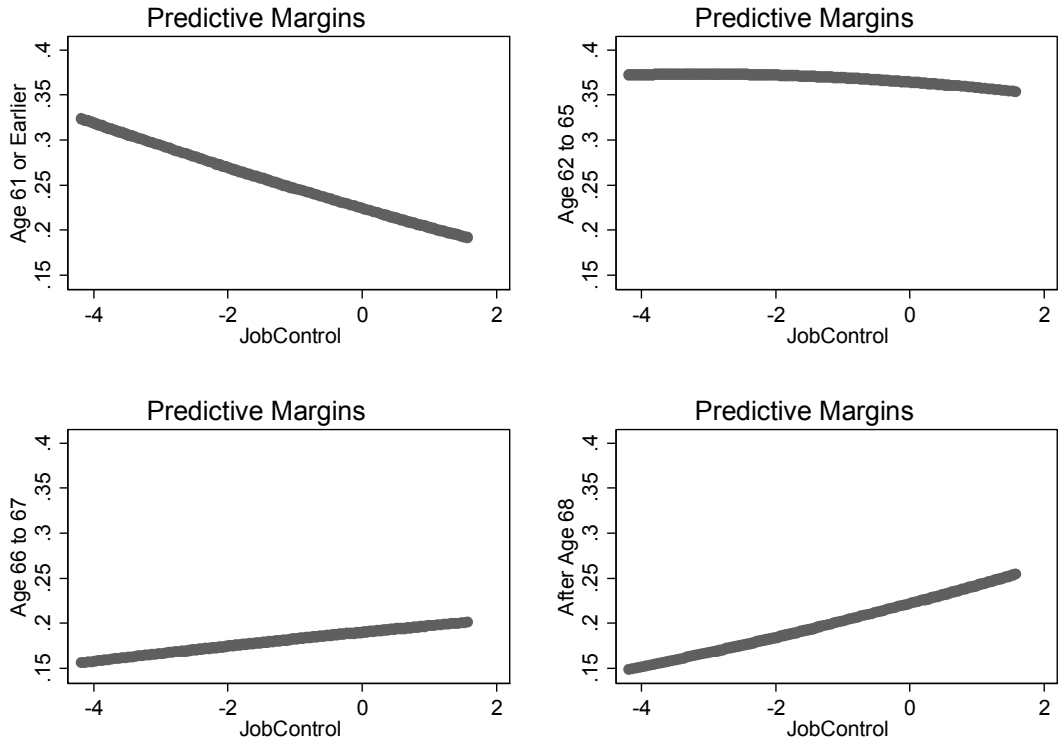

Figure 14. Predicted margins for *RetTime* outcomes over range of values for *JobControl.*

Exploratory Analysis of Combined Effects

With such a complex model, looking at the impact of only a single variable at a time, with all others either held constant or calculated at their average marginal effect , revealed only a small part of the complete picture. I next analyzed the combined influence of the two respective job characteristics factors, (*MeanEngage* and *JobControl*) relative to the groups for each of the respective significant categorical variables in the model (*SpouseRetCat*, *CollJobCat*, and *HealthInsurance*).

Before analyzing the influence of the respective categorical variables and the two job characteristic factors, I first tested to verify that each categorical variable's influence as a whole was significant and whether the differences between the categories of each respective variable were also significant. To do this I utilized the `contrast` command (Mitchell, 2012). The results

of the `contrast` command indicated each of the three variables had a significant overall effect on *RetTime* ($p = 0.001$ or less). I then did pairwise comparisons of the categories for each respective variable to check whether the differences were statistically significant. A comprehensive list of all category comparisons for each of the three variables is available in Appendix C. In the discussion that follows I noted whether certain apparent differences between categories illustrated in the graphs were shown to be statistically significant by the contrast analysis.

Figure 15 displays the combined influence across the range of the job characteristic *MeaningEngage* of *SpouseRetCat* on the dependent variable *RetTime*. Table 44 displays the predicted probabilities of each outcome of *RetTime* for each of the *SpouseRetCat* categories under the influence of *SpouseRetCat* alone with all other variables calculated at their average marginal effects as well as at the minimum and maximum levels of *MeaningEngage*. The probabilities labeled as "*SpouseRetCat* Alone" are nearly identical to those with *MeaningEngage* held at its mean. As the "*SpouseRetCat* Alone" margins essentially represent *MeaningEngage* at its mean, the results suggest that the probabilities of intending to retire at age 61 or earlier increase as *MeaningEngage* drops below its mean and decrease as it rises above its mean. The probabilities of intending to retire after age 68 decrease as *MeaningEngage* drops below its mean and increase as it rises above it. These relationships hold even for the categories "Single" and "NA but married." Note that the probability of intending to retire at age 68 or older is much higher (64.1%) when the spouse's intended time of retirement is 68 or older at the maximum levels of *MeaningEngage*. The apparent large gap for this outcome in Figure 15 between the line for spouse's intended retirement at age 68 or older and the lines for the other categories is statistically significant for all pairwise comparisons. The apparent gap between the line for

spouse's intended retirement at age 68 or older and the lines for the other categories for the second outcome, which is age 62 to 65, is also statistically significant. In general, while they do so to different degrees, each of the categories of *SpouseRetCat* react to increases in the job characteristic *MeaningEngage* as hypothesized for the first (age 61 or earlier) and last (after age 68) outcomes of *RetTime*. As *MeaningEngage* increases the probability of intending to retire at age 61 or earlier decreases across all *SpouseRetCat* categories while the probability of intending to retire after age 68 increases across all *SpouseRetCat* categories.

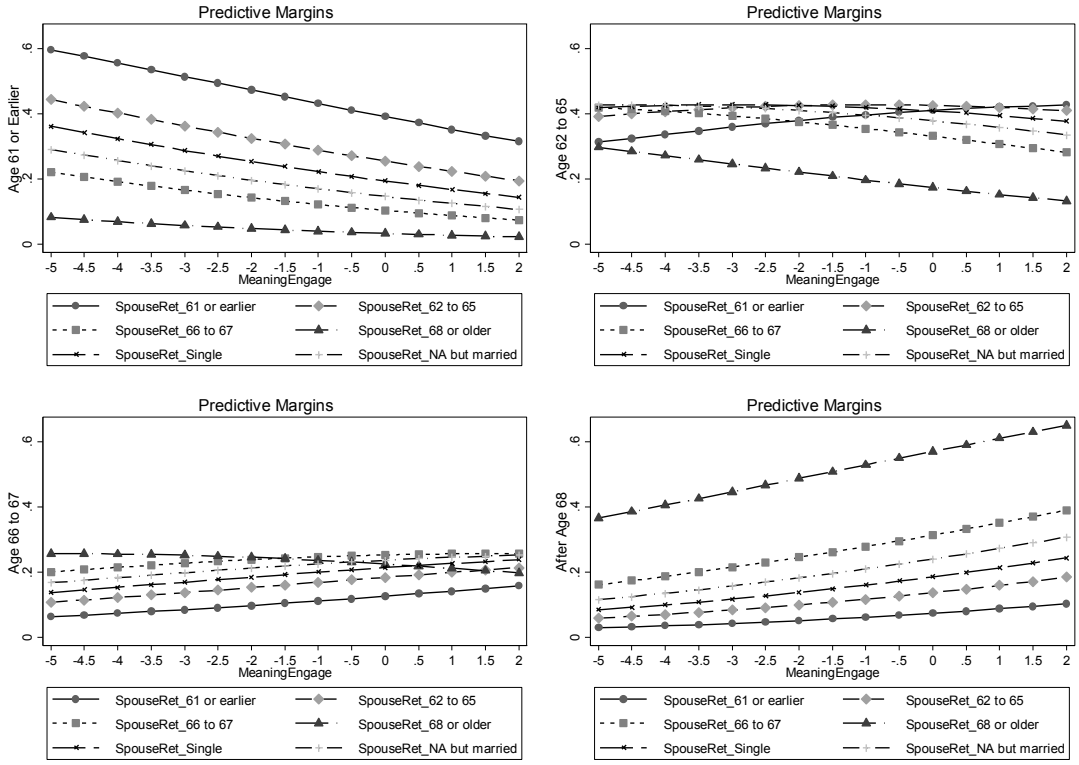

Figure 15. Influence of *MeaningEngage* on *RetTime* by *SpouseRetCat.*

Table 44

Predicted Margins for RetTime at SpouseRetCat Alone and at Minimum and Maximum Values of MeaningEngage

Outcome 1 *RetTime* = Age 61 or earlier				Outcome 2 *RetTime* = Age 62 to 65			
	Probability @ *SpouseRetCat*	Probability @ *MeaningEngage*			Probability @ *SpouseRetCat*	Probability @ *MeaningEngage*	
SpouseRetCat	Alone	Min	Max	*SpouseRetCat*	Alone	Min	Max
Age 61 or earlier	39.1%	58.4%	32.1%	Age 61 or earlier	40.9%	32.0%	42.5%
Age 62 to 65	25.5%	43.0%	20.0%	Age 62 to 65	42.3%	39.6%	41.1%
Age 66 to 67	10.5%	21.1%	7.6%	Age 66 to 67	33.0%	41.5%	28.6%
Age 68 or older	3.3%	7.7%	2.3%	Age 68 or older	17.4%	28.9%	13.6%
Single	19.4%	34.9%	14.8%	Single	40.6%	42.0%	38.0%
NA but married	14.7%	28.0%	11.0%	NA but married	37.6%	42.7%	34.0%

Outcome 3 *RetTime* = Age 66 to 67				Outcome 4 *RetTime* = Age 68 or older			
	Probability @ *SpouseRetCat*	Probability @ *MeaningEngage*			Probability @ *SpouseRetCat*	Probability @ *MeaningEngage*	
SpouseRetCat	Alone	Min	Max	*SpouseRetCat*	Alone	Min	Max
Age 61 or earlier	12.6%	6.6%	15.4%	Age 61 or earlier	7.4%	3.1%	10.0%
Age 62 to 65	18.4%	11.2%	21.0%	Age 62 to 65	13.7%	6.2%	17.9%
Age 66 to 67	25.2%	20.5%	25.6%	Age 66 to 67	31.4%	16.9%	38.2%
Age 68 or older	22.4%	25.6%	20.0%	Age 68 or older	56.9%	37.7%	64.1%
Single	21.3%	14.2%	23.5%	Single	18.6%	8.8%	23.7%
NA but married	23.6%	17.2%	25.1%	NA but married	24.1%	12.1%	30.0%

Figure 16 displays the combined influence across the range of the job characteristic *JobControl* of *SpouseRetCat* on the dependent variable *RetTime*. Table 45 displays the predicted probabilities of each outcome of *RetTime* for each of the *SpouseRetCat* categories under the influence of *SpouseRetCat* alone with all other variables calculated at their average marginal effects as well as at the minimum and maximum levels of *JobControl*. The results are comparable to those for the *MeaningEngage* job characteristic, also suggesting that the probability of intending to retire at age 61 or earlier trends lower for all *SpouseRetCat* categories

as the level of the *JobControl* job characteristic factor increases and that the probability of intending to retire after age 68 trends higher for all *SpouseRetCat* categories as the level of the *JobControl* job characteristic factor increase. As was the case for the *MeaningEngage* job characteristic, the probability of intending to retire at age 68 or older for is much higher (62.1%) when the spouse's intended time of retirement is also age 68 or older at the maximum levels of *JobControl*. The apparent large gap for this outcome in Figure 16 between the line for spouse's intended retirement at age 68 or older and the lines for the other categories is statistically significant for all pairwise comparisons ($p < .001$). The apparent gap between the line for spouse's intended retirement at age 68 or older and the lines for the other categories for the second outcome, which is age 62 to 65, is also statistically significant ($p < .001$). As suggested by the findings for the job characteristic factor *MeaningEngage*, each of the categories of *SpouseRetCat* react to increases in the job characteristic *JobControl* as hypothesized for the first (age 61 or earlier) and last (after age 68) outcomes of *RetTime*. As *JobControl* increases the probability of intending to retire at age 61 or earlier decreases across all *SpouseRetCat* categories while the probability of intending to retire after age 68 increases across all *SpouseRetCat* categories.

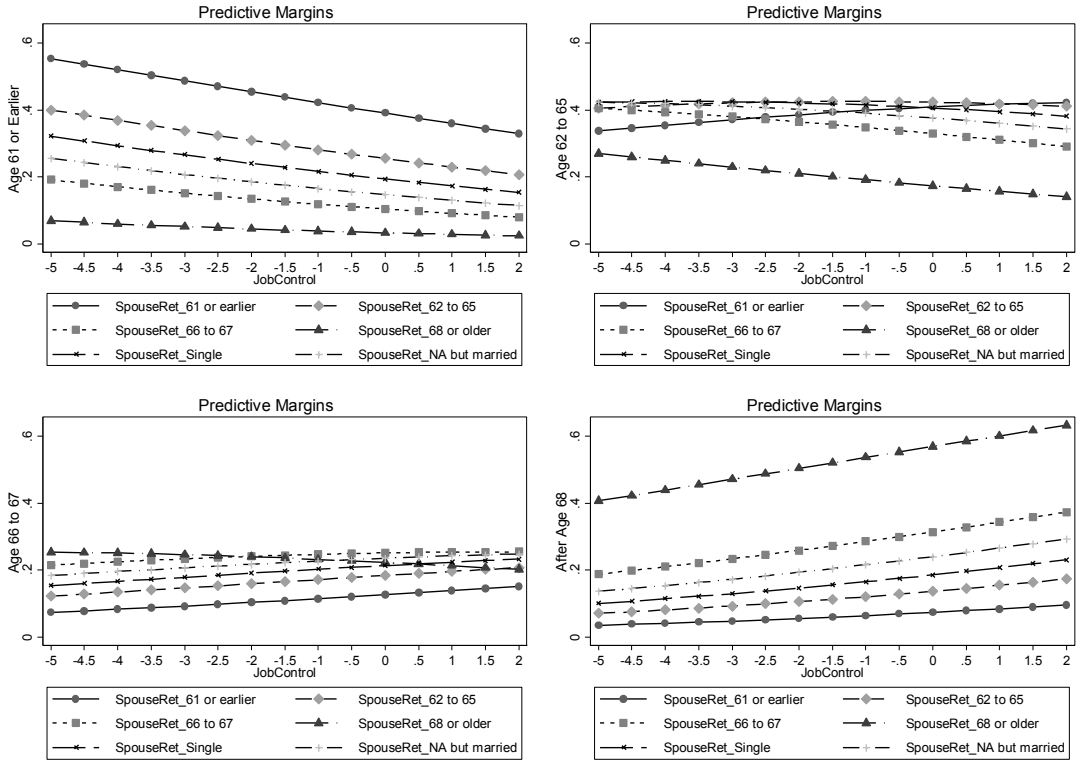

Figure 16. Influence of *JobControl* on *RetTime* by *SpouseRetCat.*

Table 45

Predicted Margins for RetTime at SpouseRetCat Alone and at Minimum and Maximum Values of JobControl

Outcome 1 *RetTime* = Age 61 or earlier				Outcome 2 *RetTime* = Age 62 to 65			
	Probability @ *SpouseRetCat*	Probability @ *JobControl*			Probability @ *SpouseRetCat*	Probability @ *JobControl*	
SpouseRetCat	Alone	Min	Max	*SpouseRetCat*	Alone	Min	Max
Age 61 or earlier	39.1%	52.7%	34.2%	Age 61 or earlier	40.9%	35.2%	42.1%
Age 62 to 65	25.5%	37.5%	21.6%	Age 62 to 65	42.3%	41.3%	41.5%
Age 66 to 67	10.5%	17.5%	8.4%	Age 66 to 67	33.0%	39.6%	29.9%
Age 68 or older	3.3%	6.2%	2.6%	Age 68 or older	17.4%	25.4%	14.7%
Single	19.4%	29.9%	16.1%	Single	40.6%	42.5%	38.7%
NA but married	14.7%	23.6%	12.1%	NA but married	37.6%	42.0%	35.0%

Outcome 3 *RetTime* = Age 66 to 67				Outcome 4 *RetTime* = Age 68 or older			
	Probability @ *SpouseRetCat*	Probabilities @ *JobControl*			Probability @ *SpouseRetCat*	Probability @ *JobControl*	
SpouseRetCat	Alone	Min	Max	*SpouseRetCat*	Alone	Min	Max
Age 61 or earlier	12.6%	8.1%	14.6%	Age 61 or earlier	7.4%	4.0%	9.2%
Age 62 to 65	18.4%	13.2%	20.3%	Age 62 to 65	13.7%	7.9%	16.6%
Age 66 to 67	25.2%	22.3%	25.5%	Age 66 to 67	31.4%	20.6%	36.2%
Age 68 or older	22.4%	25.2%	20.7%	Age 68 or older	56.9%	43.3%	62.1%
Single	21.3%	16.4%	23.0%	Single	18.6%	11.2%	22.2%
NA but married	23.6%	19.3%	24.7%	NA but married	24.1%	15.0%	28.2%

Figure 17 displays the combined influence across the range of the job characteristic *MeaningEngage* of *CollJobCat* on the dependent variable *RetTime*. The corresponding margins are given in Table 46, including those for *CollJobCat* "alone", which indicates that all other variables, including *MeaningEngage*, were handled using the average marginal effects method. As was the case for *SpouseRetCat,* each of the categories of *CollJobCat* react to increases in the job characteristic *MeaningEngage* as hypothesized for the first (age 61 or earlier) and last (after age 68) outcomes of *RetTime*. As *MeaningEngage* increases from its minimum, the probability of intending to retire at age 61 or earlier decreases across all *CollJobCat* categories while the

probability of intending to retire after age 68 increases across all *CollJobCat* categories. Unlike *SpouseRetCat*, the probability of intending to retire at the third *RetTime* outcome, age 66 to 67, also increases, albeit slightly, as *MeaningEngage* increases. Across all four outcomes the differences between the Executives and Management category and the Professionals category were significant ($p <= 0.001$). There were no significant differences between the other categories of *CollJobCat*.

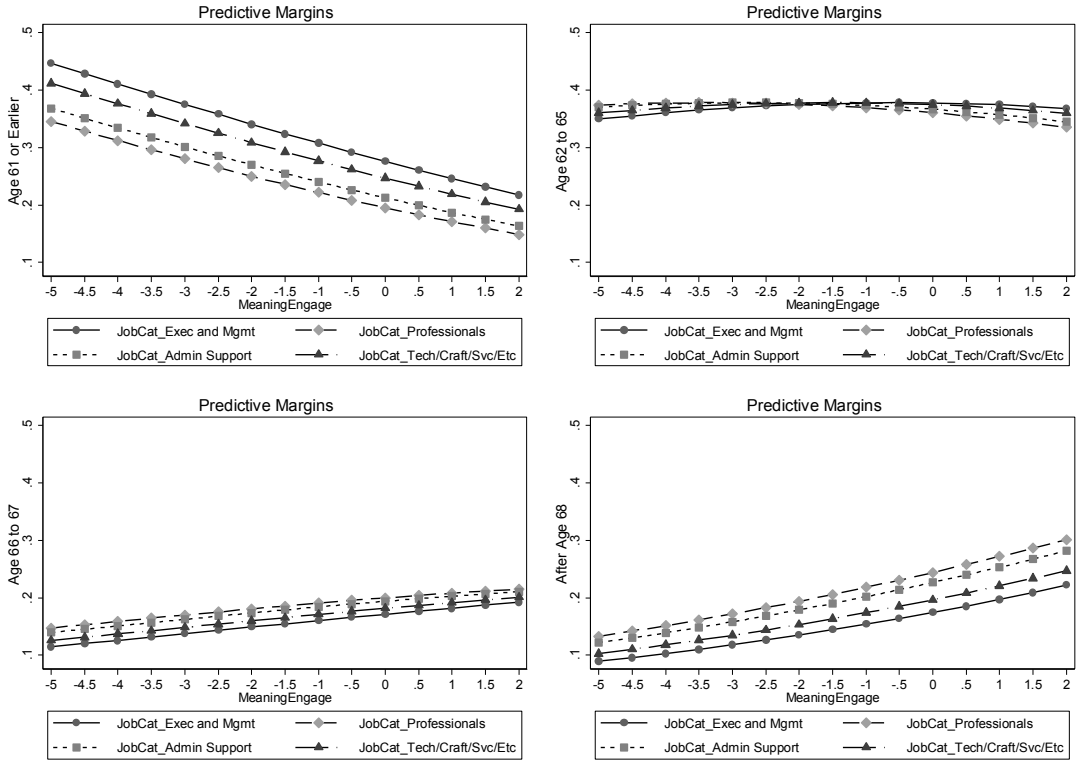

Figure 17. Influence of *MeaningEngage* on *RetTime* by *CollJobCat.*

Table 46

Predicted Margins for RetTime at CollJobCat Alone and at Minimum and Maximum Values of MeaningEngage

Outcome 1 *RetTime* = Age 61 or earlier				Outcome 2 *RetTime* = Age 62 to 65			
	Probability @ *CollJobCat*	Probability @ *MeaningEngage*			Probability @ *CollJobCat*	Probability @ *MeaningEngage*	
CollJobCat	Alone	Min	Max	*CollJobCat*	Alone	Min	Max
Exec and Mgmt	27.7%	43.6%	22.3%	Exec and Mgmt	37.6%	35.3%	37.6%
Professionals	19.6%	33.5%	15.3%	Professionals	35.9%	37.5%	37.4%
Admin Support	21.4%	35.8%	16.8%	Admin Support	36.5%	37.2%	37.7%
Tech/Craft/Srvc	24.8%	40.1%	19.8%	Tech/Craft/Srvc	37.3%	36.3%	37.8%

Outcome 3 *RetTime* = Age 66 to 67				Outcome 4 *RetTime* = Age 68 or older			
	Probability @ *CollJobCat*	Probability @ *MeaningEngage*			Probability @ *CollJobCat*	Probability @ *MeaningEngage*	
CollJobCat	Alone	Min	Max	*CollJobCat*	Alone	Min	Max
Exec and Mgmt	17.1%	11.8%	19.0%	Exec and Mgmt	17.6%	9.3%	21.7%
Professionals	20.0%	15.1%	21.3%	Professionals	24.5%	13.8%	29.5%
Admin Support	19.4%	13.3%	20.9%	Admin Support	22.7%	12.7%	27.6%
Tech/Craft/Srvc	18.2%	12.9%	19.9%	Tech/Craft/Srvc	19.7%	10.7%	24.2%

Figure 18 displays the combined influence across the range of the job characteristic *JobControl* of *CollJobCat* on the dependent variable *RetTime*. The corresponding margins are given in Table 47. While the specific predicted margins vary, the relationships between *CollJobCat* and *RetTime* as the job characteristic factor *JobControl* varies were similar to those observed for the job characteristic factor *MeaningEngage.* As *JobControl* increases the predicted margins decrease for the first *RetTime* outcome (age 61 or earlier) while the predicted margins increase for the third and fourth *RetTime* outcomes (age 66 to 67 and age 68 or later).

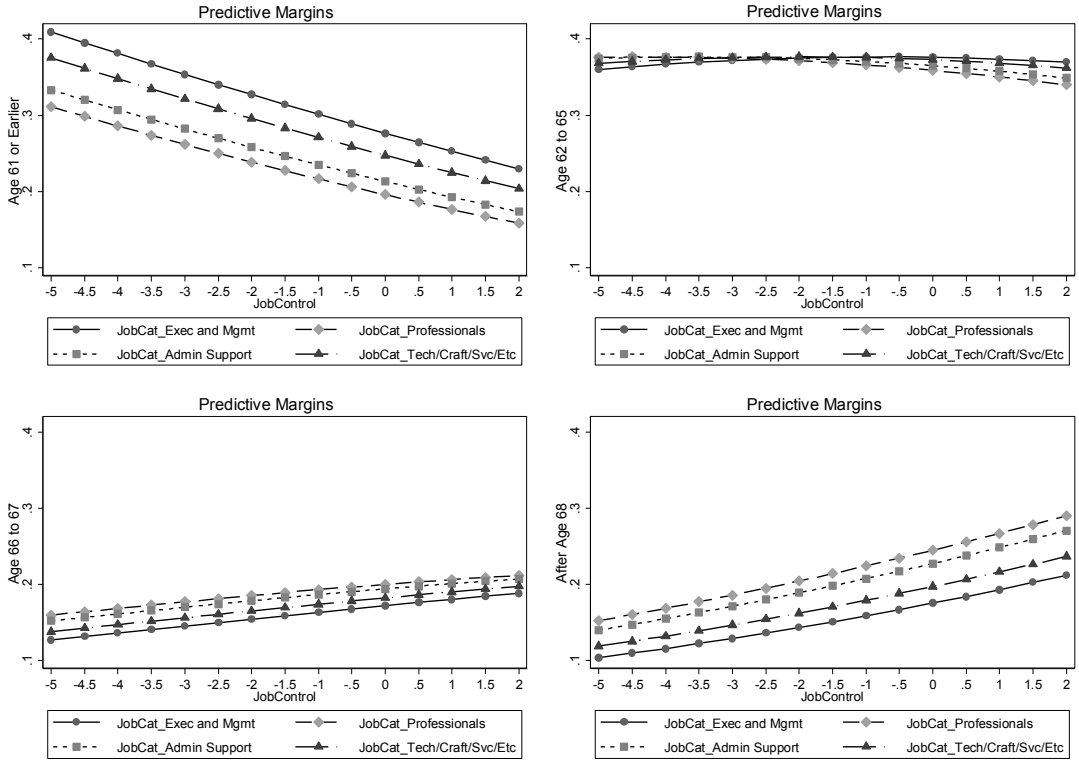

Figure 18. Influence of *JobControl* on *RetTime* by *CollJobCat.*

Table 47

Predicted Margins for RetTime at CollJobCat Alone and at Minimum and Maximum Values of JobControl

Outcome 1 *RetTime* = Age 61 or earlier				Outcome 2 *RetTime* = Age 62 to 65			
	Probability @ *CollJobCat*	Probability @ *JobControl*			Probability @ *CollJobCat*	Probability @ *JobControl*	
CollJobCat	Alone	Min	Max	*CollJobCat*	Alone	Min	Max
Exec and Mgmt	27.7%	38.7%	23.9%	Exec and Mgmt	37.6%	36.6%	37.2%
Professionals	19.6%	29.1%	16.6%	Professionals	35.9%	37.7%	34.4%
Admin Support	21.4%	31.2%	18.1%	Admin Support	36.5%	37.6%	35.3%
Tech/Craft/Srvc	24.8%	35.3%	21.2%	Tech/Craft/Srvc	37.3%	37.2%	36.5%

Outcome 3 *RetTime* = Age 66 to 67				Outcome 4 *RetTime* = Age 68 or older			
	Probability @ *CollJobCat*	Probability @ *JobControl*			Probability @ *CollJobCat*	Probability @ *JobControl*	
CollJobCat	Alone	Min	Max	*CollJobCat*	Alone	Min	Max
Exec and Mgmt	17.1%	13.4%	18.5%	Exec and Mgmt	17.6%	11.3%	20.4%
Professionals	20.0%	16.7%	21.0%	Professionals	24.5%	16.5%	28.1%
Admin Support	19.4%	15.9%	20.5%	Admin Support	22.7%	15.2%	26.1%
Tech/Craft/Srvc	18.2%	14.5%	19.5%	Tech/Craft/Srvc	19.7%	12.9%	22.8%

Figure 19 displays the combined influence across the range of the job characteristic *MeaningEngage* of *HealthInsurance* on the dependent variable *RetTime*. The corresponding margins are given in Table 48. *HealthInsurance* is an ordinal variable that captures the respondents' level of expectation that they will be covered by medical insurance if they retire before they are eligible for Medicare. The trends reflect those discussed in relation to the categorical variables *SpouseRetCat* and *CollJobCat*. Each of the categories of *HealthInsurance* react to increases in the job characteristic *MeaningEngage* as hypothesized for the first (age 61 or earlier) and last (after age 68) outcomes of *RetTime*. As *MeaningEngage* increases the probability of intending to retire at age 61 or earlier decreases across all *HealthInsurance* categories while the probability of intending to retire after age 68 increases across all

HealthInsurance categories. Unlike *SpouseRetCat*, but similarly to *CollJobCat* the probability of intending to retire at the third *RetTime* outcome, age 66 to 67, also increases, albeit slightly, as *MeaningEngage* increases. There also appears to be a more pronounced decrease in the probability of intending to retire at age 62 to 65 (the second *RetTime* outcome) at high levels of *MeaningEngage*, across the *HealthInsurance* categories, yet little to no change at the lowest levels. Across all outcomes of *RetTime*, the respective contrasts between *HealtInsurance* category 4 (likely) and 5 (extremely likely) and category 2 (unlikely) are significant ($p = 0.05$ or less). Categories 4 and 5 are also statistically different ($p = 0.005$ or less) with respect to category 1 (extremely unlikely) for all *RetTime* outcomes except the second (age 62 to 65).

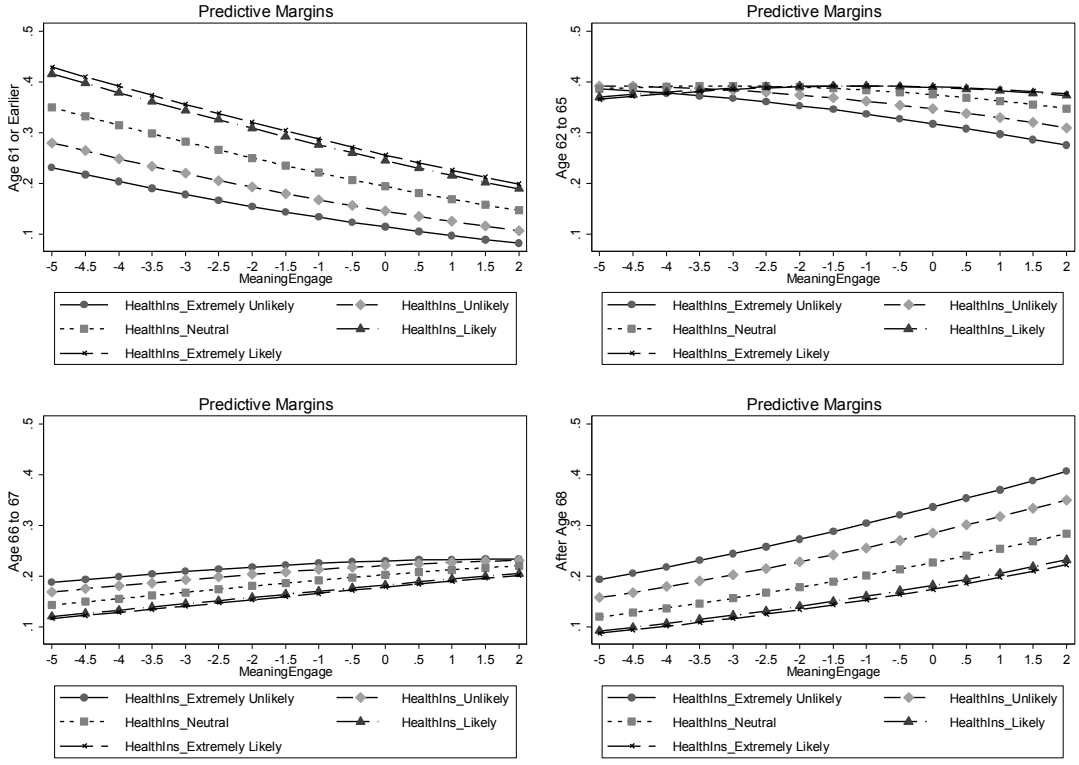

Figure 19. Influence of *MeaningEngage* on *RetTime* by *HealthInsurance.*

Table 48

Predicted Margins for RetTime at HealthInsur. Alone and at Minimum and Maximum Values of MeaningEngage

Outcome 1 *RetTime* = Age 61 or earlier				Outcome 2 *RetTime* = Age 62 to 65			
	Probability @ *HealthInsur.*	Probability @ *MeaningEngage*			Probability @ *HealthInsur.*	Probability @ *MeaningEngage*	
HealthInsur.	Alone	Min	Max	*HealthInsur.*	Alone	Min	Max
Ext. Unlikely	11.6%	22.3%	8.6%	Ext. Unlikely	31.8%	38.5%	28.1%
Unlikely	14.7%	27.1%	11.1%	Unlikely	34.6%	39.2%	31.4%
Neutral	19.6%	33.9%	15.1%	Neutral	37.4%	38.9%	35.1%
Likely	24.6%	40.5%	19.5%	Likely	38.8%	37.4%	37.5%
Ext. Likely	25.7%	41.8%	20.4%	Ext. Likely	38.9%	37.0%	37.9%

Outcome 3 *RetTime* = Age 66 to 67				Outcome 4 *RetTime* = Age 68 or older			
	Probability @ *HealthInsur.*	Probability @ *MeaningEngage*			Probability @ *HealthInsur.*	Probability @ *MeaningEngage*	
HealthInsur.	Alone	Min	Max	*HealthInsur.*	Alone	Min	Max
Ext. Unlikely	22.9%	19.2%	23.4%	Ext. Unlikely	33.8%	20.0%	40.0%
Unlikely	22.0%	17.3%	23.1%	Unlikely	28.7%	16.4%	34.4%
Neutral	20.2%	14.7%	22.0%	Neutral	22.8%	12.5%	27.8%
Likely	18.2%	12.5%	20.3%	Likely	18.4%	9.7%	22.7%
Ext. Likely	17.8%	12.1%	19.9%	Ext. Likely	17.6%	9.2%	21.7%

Figure 20 displays the combined influence across the range of the job characteristic *JobControl* of *HealthInsurance* on the dependent variable *RetTime*. The corresponding margins are given in Table 49. While the predicted margins vary a bit, the relationship patterns are essentially the same as those observed between *HealthInsurance* and *RetTime* as the job characteristic *MeaningEngage* changed value.

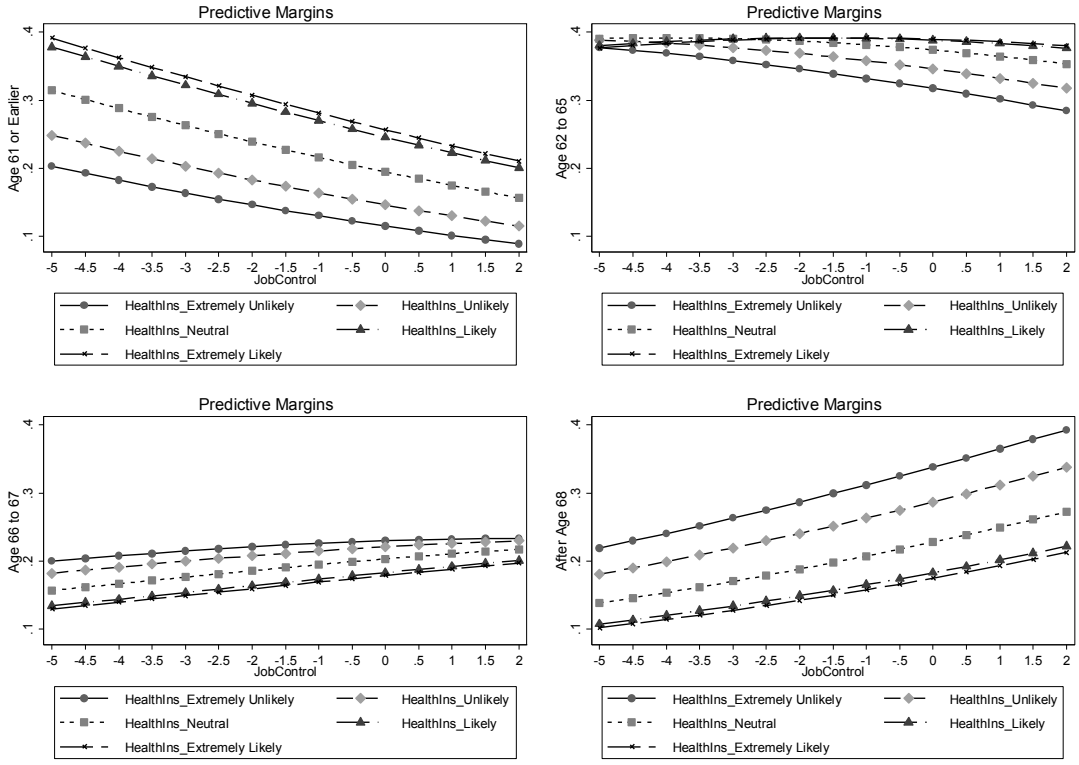

Figure 20. Influence of *JobControl* on *RetTime* by *HealthInsurance.*

Table 49

Predicted Margins for RetTime at HealthInsur. Alone and at Minimum and Maximum Values of JobControl

Outcome 1 *RetTime* = Age 61 or earlier				Outcome 2 *RetTime* = Age 62 to 65			
	Probability @ *HealthInsur.*	Probability @ *JobControl*			Probability @ *HealthInsur.*	Probability @ *JobControl*	
HealthInsur.	Alone	Min	Max	*HealthInsur.*	Alone	Min	Max
Ext. Unlikely	11.6%	18.7%	9.4%	Ext. Unlikely	31.8%	37.0%	29.1%
Unlikely	14.7%	23.0%	12.1%	Unlikely	34.6%	38.5%	32.3%
Neutral	19.6%	29.3%	16.4%	Neutral	37.4%	39.1%	35.8%
Likely	24.6%	35.5%	20.9%	Likely	38.8%	38.5%	37.9%
Ext. Likely	25.7%	36.8%	21.9%	Ext. Likely	38.9%	38.2%	38.2%

Outcome 3 *RetTime* = Age 66 to 67				Outcome 4 *RetTime* = Age 68 or older			
	Probability @ *HealthInsur.*	Probability @ *JobControl*			Probability @ *HealthInsur.*	Probability @ *JobControl*	
HealthInsur.	Alone	Min	Max	*HealthInsur.*	Alone	Min	Max
Ext. Unlikely	22.9%	20.6%	23.3%	Ext. Unlikely	33.8%	23.6%	38.2%
Unlikely	22.0%	19.0%	22.8%	Unlikely	28.7%	19.6%	32.7%
Neutral	20.2%	16.5%	21.5%	Neutral	22.8%	15.1%	26.3%
Likely	18.2%	14.2%	19.8%	Likely	18.4%	11.8%	21.4%
Ext. Likely	17.8%	13.8%	19.4%	Ext. Likely	17.6%	11.2%	20.5%

Exploratory Analysis of Interaction Terms

As described previously in this chapter, I added an interaction term between *Female* and *AgeBEO2013* (age of the respondent by the end of 2013) so as to include in the model the differential experience of aging in the workforce for women and men. I also added a three-way interaction between *DCRetPlan*, *AgeBEO2013*, and *YrsinPos* to capture the influence of the complex formulas used to determine eligibility to receive full retirement benefits under the defined benefit plans available to the study population. These plans combine the number of credited years of work with the employees' age in several different ways, which prevented me from identifying and controlling directly for the age at which full benefits were available for any

given respondent. The three-way interaction was intended to serve as a reasonable proxy for that information.

Interaction of *Female* and *AgeBEO2013*

While the main effects for *Female* were not significant ($p = 0.171$), the interaction between *Female* and *AgeBEO2013* was ($p = 0.012$). I plotted the predicted margins for the four *RetTime* outcomes relative to the influence of *AgeBEO2013* for male and female at the minimum, median, and maximum values of *MeaningEngage* in Figure 21. In a similar way, I plotted the interaction at the minimum, median, and maximum values of *JobControl* in Figure 22. In both cases I chose the median, rather than the mean, value of the job characteristics variables due to the negative skew present in the distribution of both factors. Additionally, by using the median one can interpret the line on the graph as being the point at which half of the sample is above and half is below that level of the job characteristic in question. For both job characteristic factors, the plots are remarkably similar, differing only slightly in a shifting of the curves along the *y*-axis. In both cases, the probability of intending to retire at age 61 or earlier decreases as age increases, although the probability is generally higher for women regardless of age and the probability is generally higher at the minimum level of the job characteristic factors, *MeaningEngage* and *JobControl*, regardless of age and gender. The probability of intending to retire at age 62 to 65 is much higher for women than it is for men regardless of age. It increases more rapidly than it does for men as age increases until it peaks around age 60, at which point the lines for median and max values for the two job characteristics indicate a decrease in probability while the line for the minimum values suggests a slight increase in probability for *MeaningEngage* and a decreases for *JobControl*. The probability of intending to retire at age 66 to 67 increases very gradually and by an overall small amount as age increases for men, with

little to no difference between the three levels of the job characteristics factors. For women, the probability of intending to retire at age 66 to 67 increases rapidly with age, although the probability is generally less, regardless of age, at minimum values of the job characteristics factors. This may be a reflection of the dramatically higher probabilities of women intending to retire at the earlier age groups, meaning that age 66 to 67 may actually represent "late" retirement for many women. As seen to this point, lower levels of the job characteristic factors are generally associated with lower probabilities of intending to retire at the latest range, and that range may be closer to age 66 to 67 than it is to after age 68 for many women. For both men and women the probability of intending to retire after age 68 increases steadily as age increases, although the increase is slightly more gradual for women. This holds true under the influence of both *MeaningEngage* and *JobControl*. For both job characteristics and both genders, the probabilities of intending to retire after age 68 are generally lower regardless of age at the minimum values of the job characteristics factors.

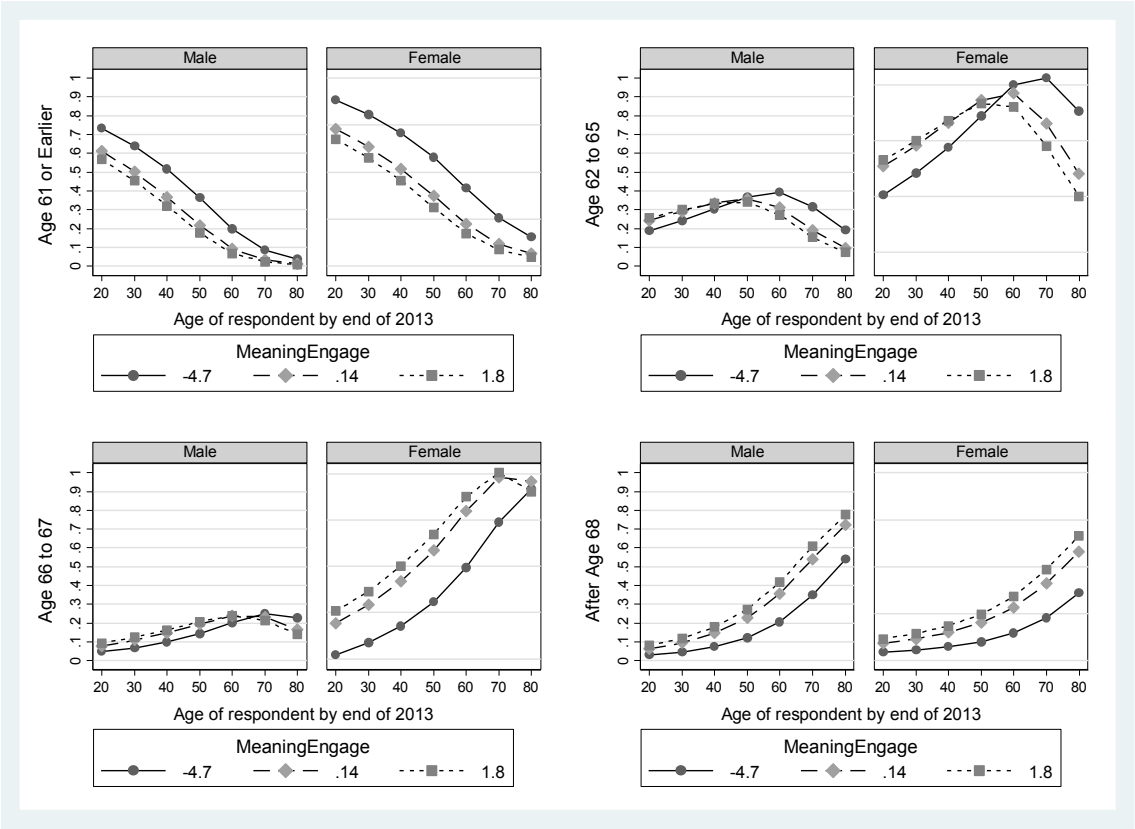

Figure 21. Influence of the interaction of *Female* and *AgeBEO2013* at min, median, and max values of *MeaningEngage* on *RetTime.*

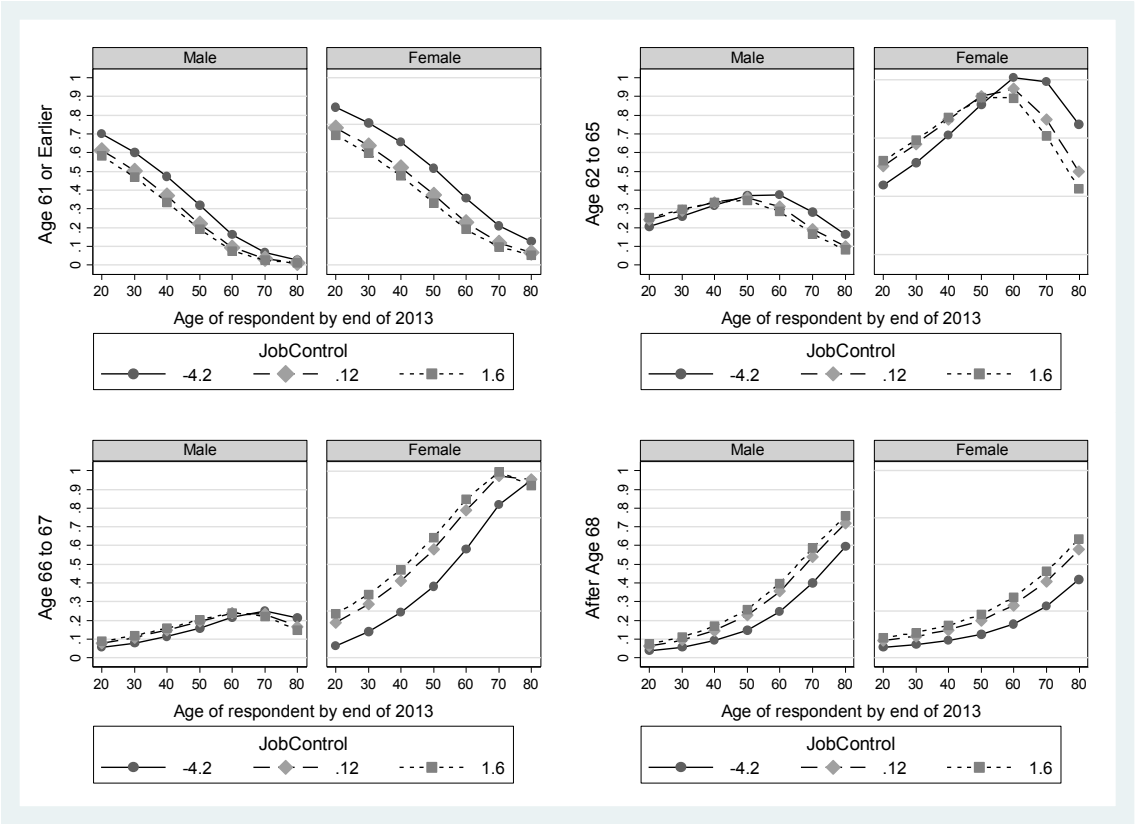

Figure 22. Influence of the interaction of *Female* and *AgeBEO2013* at min, median, and max values of *JobControl* on *RetTime.*

Interaction of *DCRetPlan*, *AgeBEO2013*, and *YrsinPos*

In order to analyze the influence of the three-way interaction, I predicted margins across a range of ages for both the defined benefit and defined contribution retirement plans for the minimum, median, and maximum values of the two job characteristics factors, *MeaningEngage* and *JobControl*, at four representative values for the number of years in the current position: 1, 10, 20, and 30. I then graphed those margins for each of the four outcome categories of the dependent variable *RetTime*.

In the following figures, I inserted a vertical reference line in the graphs for *YrsinPos* = 10, *YrsinPos* = 20, and *YrsinPos* = 30 at positions on the *x*-axis (30, 40, and 50 years, respectively) that approximated the earliest age at which an employee would be likely to have

achieved that length of tenure. Thus, when viewing the graphs, keep in mind that plot points to the left of those vertical reference lines represent unrealistic values for the interaction (e.g., an employee who is 20 years old but has worked for 20 years). Also keep in mind that only a small number of cases (n = 15) are older than 69, which suggests that the 95% confidence intervals for data points from 70 and on are likely to be extremely broad, thus minimizing the validity of what those points appear to indicate.

Figures 23 through 30, in pairs, illustrate the effect of the three-way interaction, using the four representative values for *YrsinPos* with three plot lines representing the minimum, median, and maximum values of *MeaningEngage* and *JobControl*. Figures 23 and 24 cover the first *RetTime* outcome (age 61 or earlier) for the two respective job characteristic factors, Figures 25 and 26 cover the second (between age 62 and 65), Figures 27 and 28 cover the third (between age 66 and 67), and Figures 29 and 30 cover the fourth (after age 68). The effects of the two job characteristics factors are nearly identical relative to the three-way interaction and, in both cases, there are only small differences between the plot lines for the minimum, median, and maximum values, which suggests that the variance in the predicted margins due to either job characteristic is very small relative to the influence of the three-way interaction. As a result, I decided to focus primarily on the relationship between the three-way interaction and the predicted margins for the four *RetTime* outcomes, with only occasional references to the respective influence of the three levels of *MeaningEngage* and *JobControl*.

Figures 23 and 24 illustrate the three-way interaction for the first *RetTime* outcome, which is the intent to retire before the age of 61 for the two job characteristic factors. The four component graphs in each figure represent the four representative values for *YrsinPos*: 1, 10, 20, and 30 years. The figures suggest that the probability of intending to retire at this point decreases

with age at an increasingly rapid rate as the number of years in the position increase. Note that, in both figures, the plot lines for the lowest levels of the respective job characteristic variables, *MeaningEngage* and *JobControl* indicate generally higher probabilities of intending to retire at this point regardless of age or years in position. At all four representative values of years in position, the probability of intending to retire at age 61 or earlier is generally higher for defined benefit plans than it is for defined contribution plans. This difference appears to increase with both age and years in position.

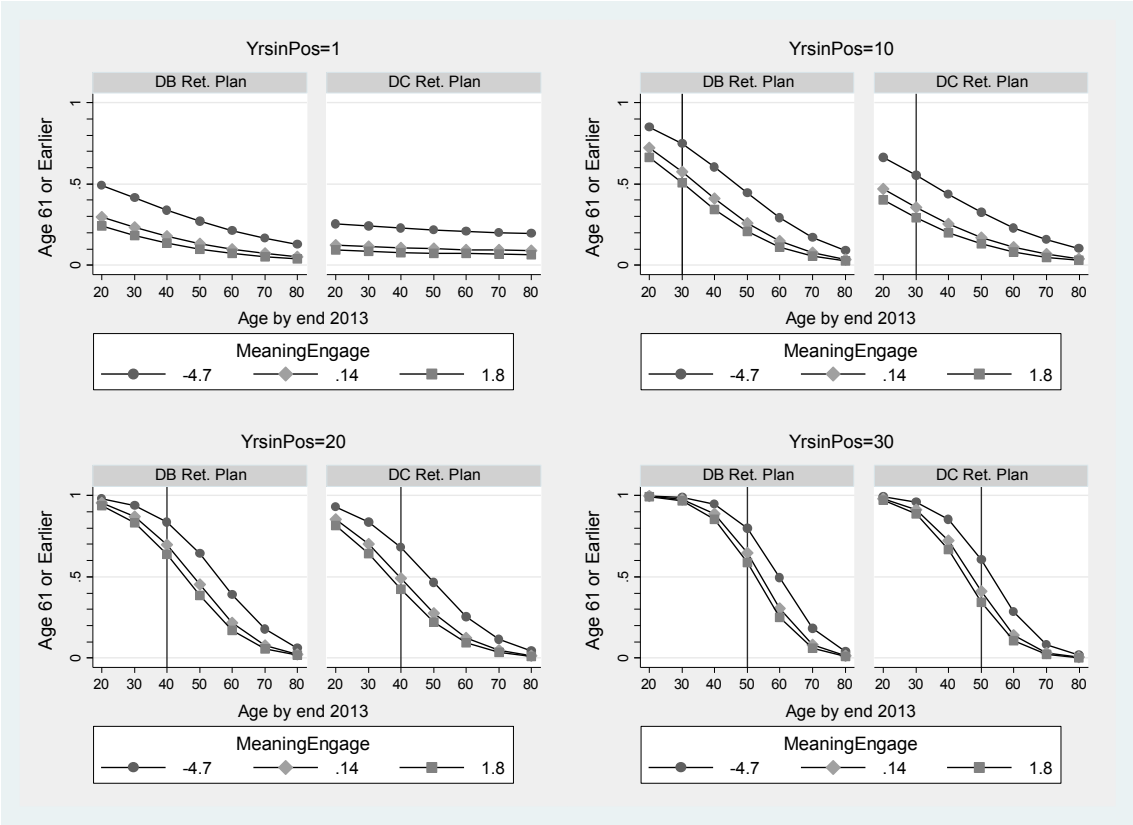

Figure 23. Influence of the interaction of *DCRetPlan, AgeBEO2013,* and *YrsinPos* at representative values of *YrsinPos* and min, median, and max values of *MeaningEngage* for predicted probabilities of *RetTime* outcome 1; age 61 or earlier.

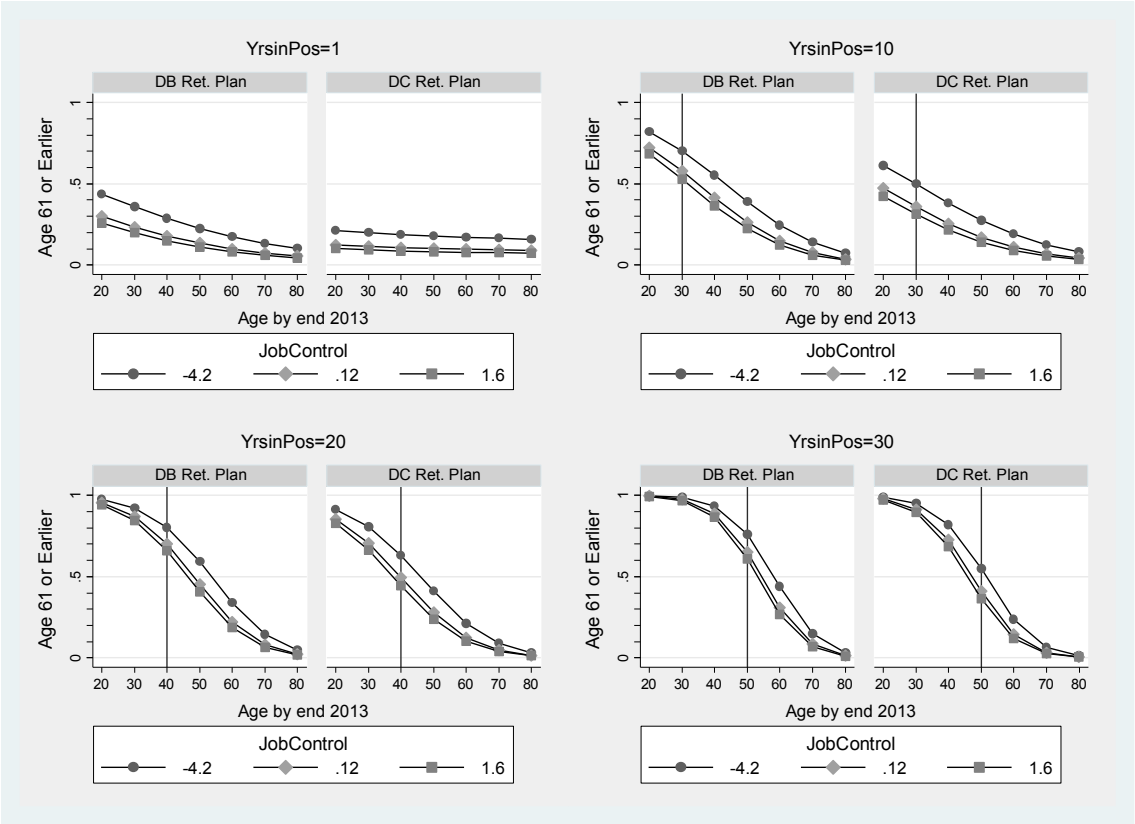

Figure 24. Influence of the interaction of *DCRetPlan, AgeBEO2013,* and *YrsinPos* at representative values of *YrsinPos* and min, median, and max values of *JobControl* for predicted probabilities of *RetTime* outcome 1; age 61 or earlier.

Figures 25 and 26 illustrate the three-way interaction for the second *RetTime* outcome, which is the intent to retire between age 62 and 65, at the four representative values for *YrsinPos* for the two job characteristic factors. The figures suggests that the probability of intending to retire at this point decreases gradually for those with only one year on the job. For the other three values of *YrsinPos*, the probability of retiring at this point increases slightly or remains relatively stable until approximately age 50 to 60, at which point the probabilities begin to decrease at a moderate pace. At all four representative values of years in position, the probability of intending to retire between age 62 and 65 is roughly similar for both types of retirement plans, although probabilities for those with defined benefit plans appear to be a bit lower. This suggests that the

type of plan has a relatively small influence on the predicted probabilities for this *RetTime* outcome.

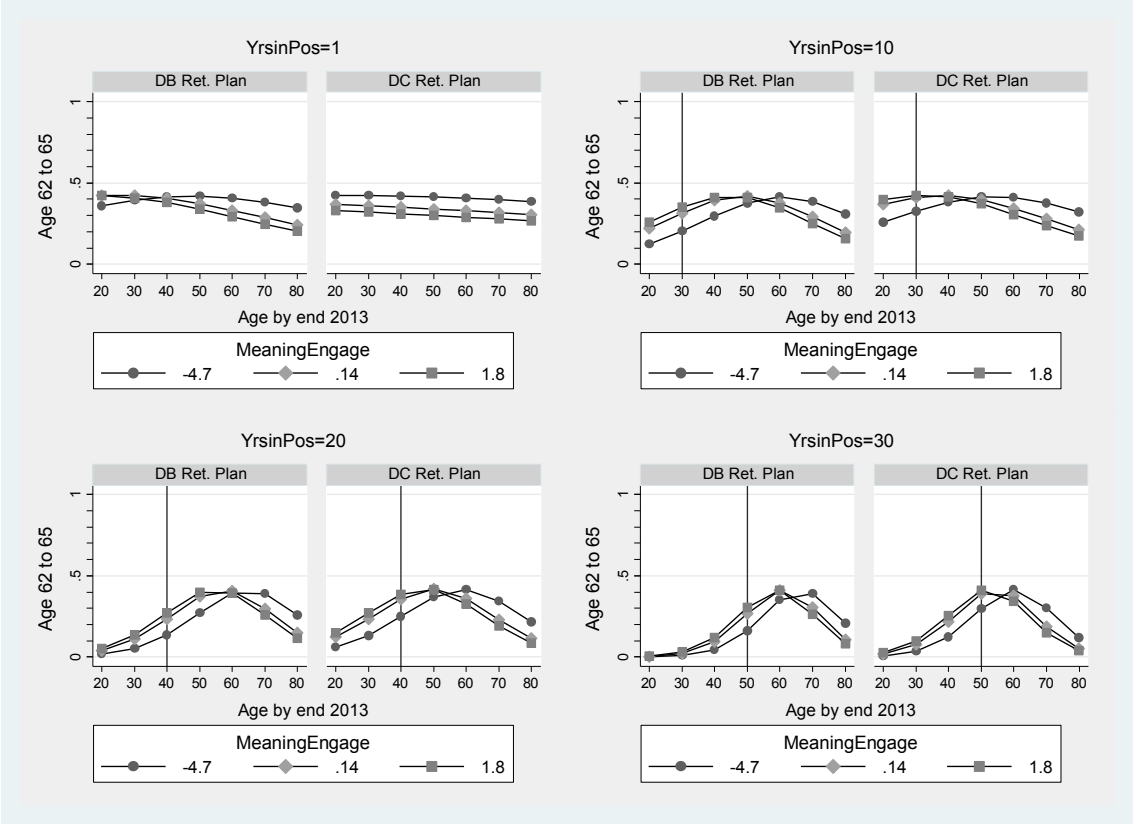

Figure 25. Influence of the interaction of *DCRetPlan, AgeBEO2013,* and *YrsinPos* at representative values of *YrsinPos* and min, median, and max values of *MeaningEngage* for predicted probabilities of *RetTime* outcome 2; between age 62 and 65.

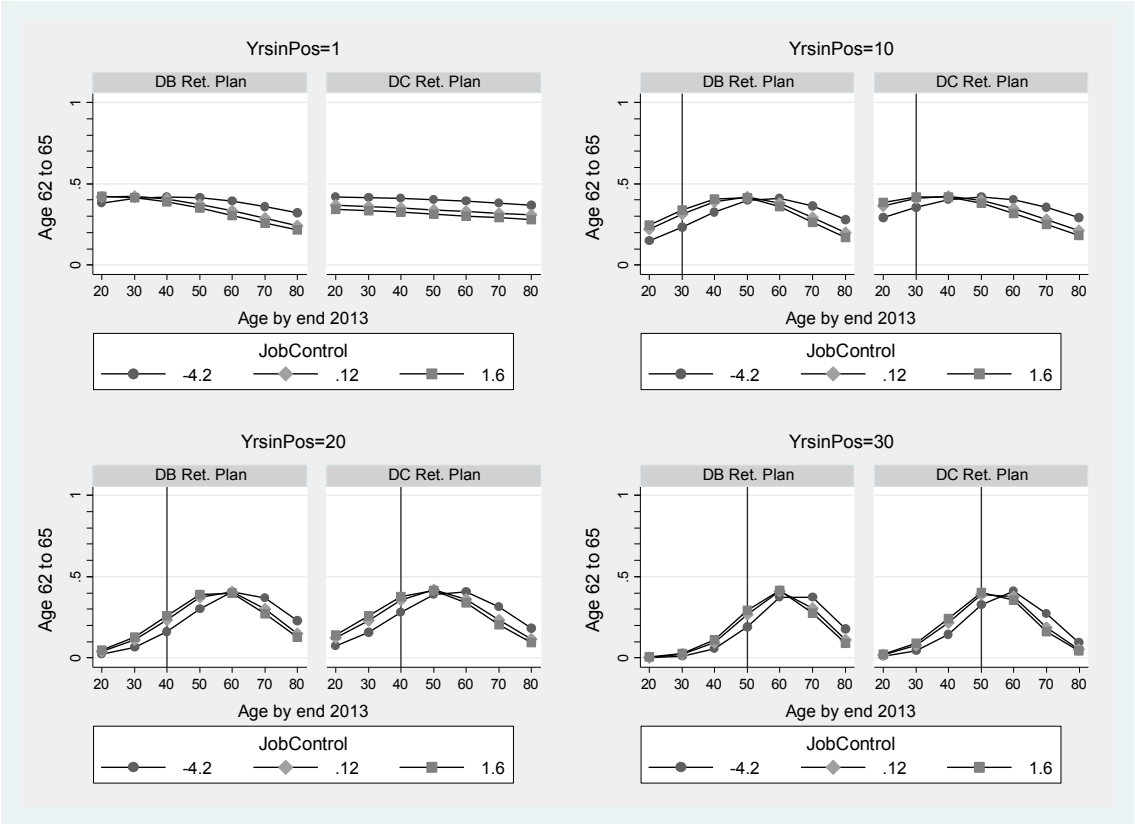

Figure 26. Influence of the interaction of *DCRetPlan, AgeBEO2013,* and *YrsinPos* at representative values of *YrsinPos* and min, median, and max values of *JobControl* for predicted probabilities of *RetTime* outcome 2; between age 62 and 65.

Figures 27 and 28 illustrate the three-way interaction for the third *RetTime* outcome, which is the intent to retire between age 66 and 67, at the four representative values for *YrsinPos* for the two job characteristic factors. The figures suggests that the probability of intending to retire at this point remains fairly stable at 1 year on the job and increases gradually at an almost identical rate at 10, 20, and 30 years on the job. As was the case for the second outcome of *RetTime* (age 62 to 65), the probability of intending to retire between age 66 and 67 is only slightly lower for those with defined benefit plans.

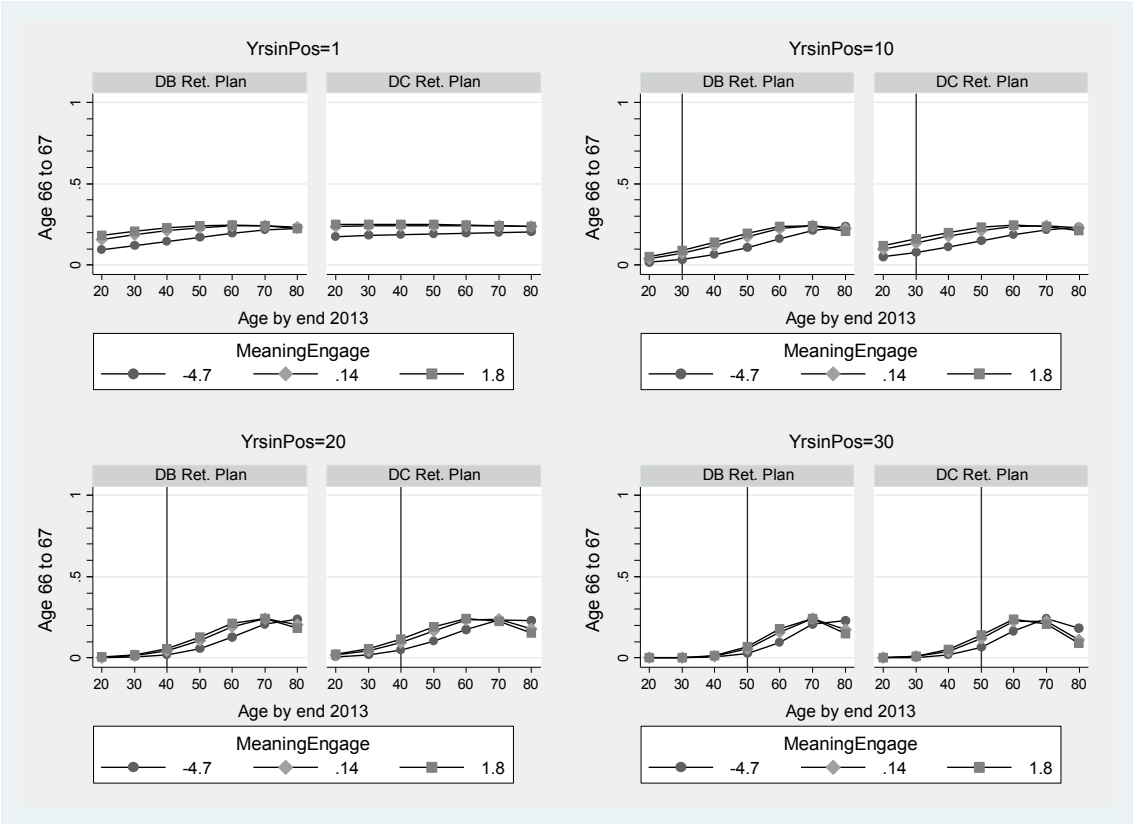

Figure 27. Influence of the interaction of *DCRetPlan, AgeBEO2013,* and *YrsinPos* at representative values of *YrsinPos* and min, median, and max values of *MeaningEngage* for predicted probabilities of *RetTime* outcome 3; between age 66 and 67.

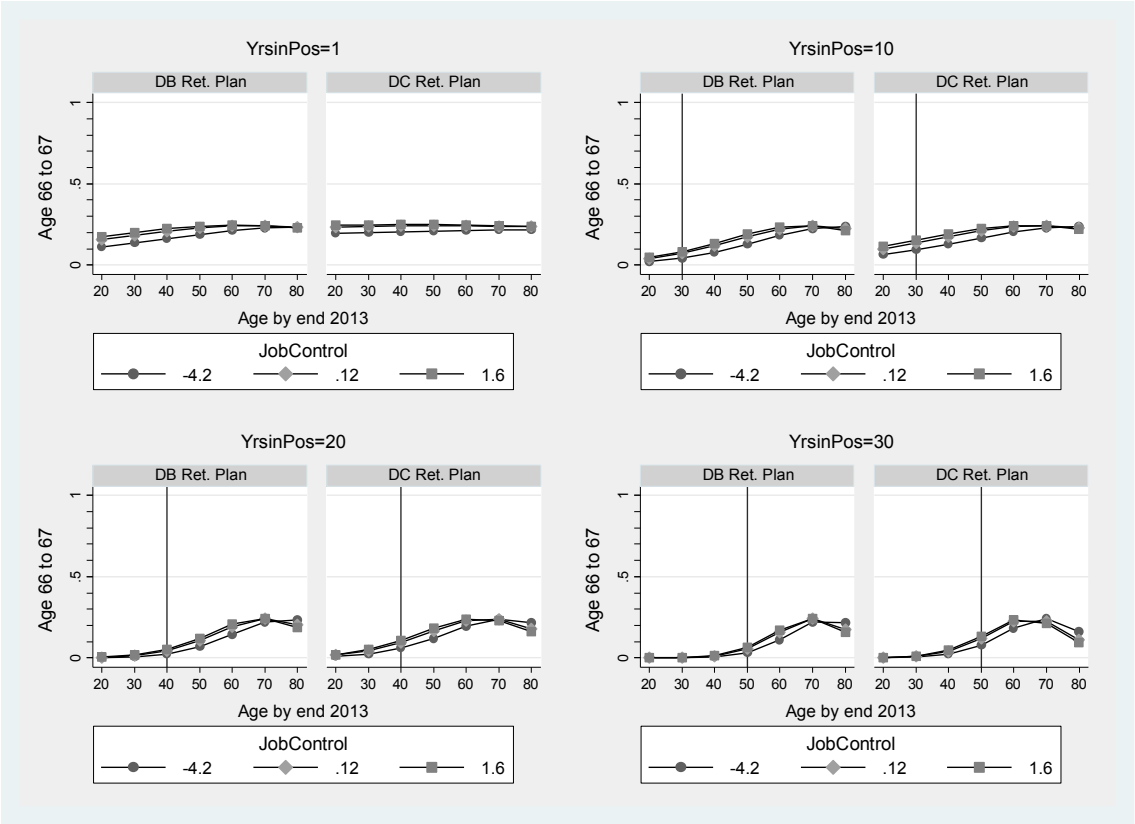

Figure 28. Influence of the interaction of *DCRetPlan, AgeBEO2013,* and *YrsinPos* at representative values of *YrsinPos* and min, median, and max values of *JobControl* for predicted probabilities of *RetTime* outcome 3; between age 66 and 67.

Figures 29 and 30 illustrate the three-way interaction for the fourth *RetTime* outcome, which is the intent to retire after age 68, at the four representative values for *YrsinPos* for the two job characteristic factors. The figures suggests that the probability of intending to retire at this point increases at a moderate pace at 1 year on the job after which the pace becomes much more rapid with each successive level of years on the job. At one year on the job, the probability of intending to retire between age 66 and 67 is generally slightly higher for those with defined benefit plans irrespective of age. At the other three representative values of *YrsinPos*, the probabilities for those with defined benefit plans appear to be slightly lower than what was predicted for those with defined contribution plans. For this outcome of *RetTime*, there appears to be scant difference between the predicted probabilities at the median and maximum levels of

MeaningEngage and *JobControl*. However, the plot line for the minimum levels for both factors appears associated with reduced probabilities of intending to retire at this point as age increases across all four values for *YrsinPos*.

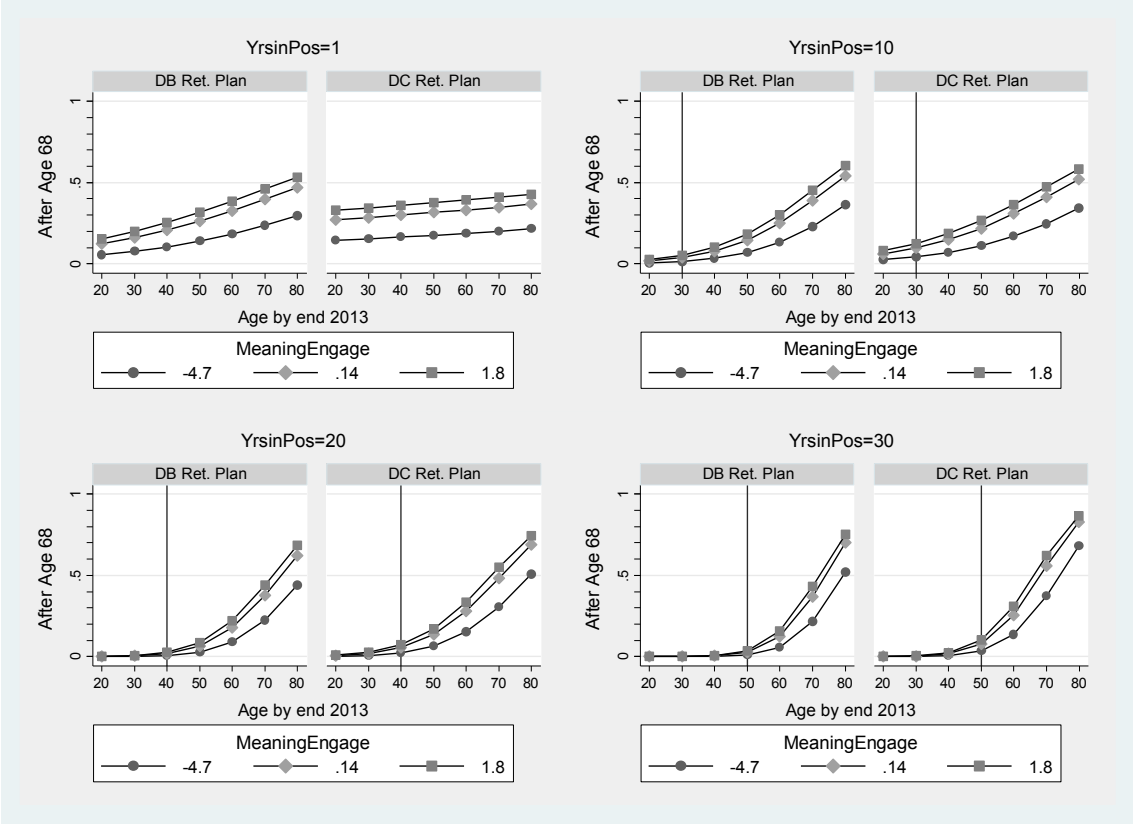

Figure 29. Influence of the interaction of *DCRetPlan, AgeBEO2013,* and *YrsinPos* at representative values of *YrsinPos* and min, median, and max values of *MeaningEngage* for predicted probabilities of *RetTime* outcome 4; after age 68.

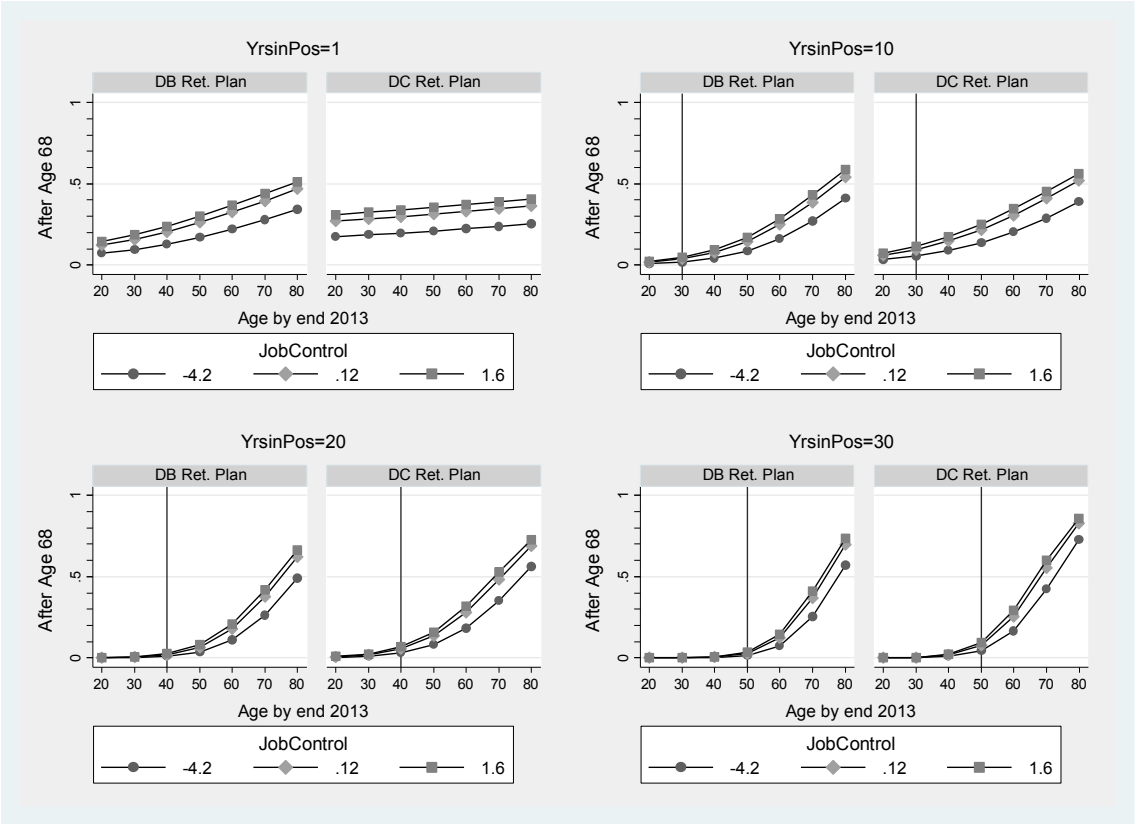

Figure 30. Influence of the interaction of *DCRetPlan, AgeBEO2013,* and *YrsinPos* at representative values of *YrsinPos* and min, median, and max values of *JobControl* for predicted probabilities of *RetTime* outcome 4; after age 68.

The preceding graphs appear to suggest that the level of influence of the *MeaningEngage* and *JobControl* job characteristics is fairly weak relative to the influence of the three-way interaction between *DCRetPlan*, *AgeBEO2013*, and *YrsinPos*, with the largest differences between minimum and maximum levels of the job characteristics noticeable for the first (age 61 or earlier) and fourth (after age 68) *RetTime* outcomes. Interestingly, even in those situations, the apparent difference between the plot lines for the median and maximum values of the job characteristics are minimal.

Chapter Summary

The research question for this study was: to what extent do the core job dimension variables of the JCM (Hackman & Oldham, 1976, 1980) explain variance in employees'

intended retirement timing relative to the normal retirement age (Social Security Administration, 2006) as defined by the Social Security Administration? In pursuit of that question, I collected data, via an electronic survey, from the study population and subjected the data to statistical analysis.

During univariate analysis, I discovered, through factor analysis of the Job Diagnostic Survey data, that the five-factor model proposed by the Job Characteristics Model (Hackman & Oldham, 1976, 1980) did not appear to be valid for this sample. As a result, I abandoned the plan to analyze the impact of job characteristics on retirement time by using a Motivating Potential Score (MPS) and carried out the remainder of the analysis on the two identified factors: meaningful engagement and job control.

The final ordinal logistic regression model suggests that increases in both identified job characteristic factors tend to decrease the probability of retiring before the normal retirement age and increase the probability of retiring after the normal age of retirement, thus supporting the hypotheses derived from the research question, as modified by the results of the factor analysis of the JDS. The model further suggests that this relationship holds over several categorical variables that identify the intended timing of spousal retirement, the respondents' job category, and the likelihood of access to health insurance if retirement occurs before the age of eligibility for Medicare is reached. The model also suggests that the influence of the identified job characteristics persists relative to the two-way interaction of gender and age and the three-way interaction of retirement plan type, age, and years in position, although it appears to be much weaker in the latter case.

CHAPTER FIVE

DISCUSSION

Introduction

In this chapter I briefly review the study's purpose and methodology and then discuss the major findings. I also discuss the study limitations, some possible directions for future research, and my recommendations for policy and practice.

Summary of the Study and Methodology

This study set out to examine the possible relationships between factors that are modifiable by organizations and the expected timing of employees' retirement decision. Using a cross-sectional survey research design, data from 13 of the 14 campuses and the Office of the Chancellor of the Pennsylvania State System of Higher Education were collected and analyzed with the objective of identifying the possible influence of job characteristics on the intended retirement timing reported by employees. The study identified two independent variables of interest: meaningful engagement and job control. Ordinal logistic regression was employed to model the data and interpret the findings.

Discussion of Findings

The research question for this study was: to what extent do the core job dimension variables of the JCM (Hackman & Oldham, 1976, 1980) explain variance in employees' intended retirement timing relative to the normal retirement age (Social Security Administration, 2006) as defined by the Social Security Administration? The impetus for examining this question arises from the projection of a large increase in the number of retirement age and older workers in the U.S. labor force by 2016 (U.S. Bureau of Labor Statistics, 2008), due to the fact that the leading edge of the 78 million (Schaeffer, as cited in Smola & Sutton, 2002) Baby Boomers have

reached the age at which they are eligible for retirement with full Social Security benefits (Ekerdt, 2010). As the Baby Boomers retire, the likelihood is that the result will be a net and significant reduction in the size of the overall workforce as Generation X, typically defined as those born between 1960 and 1980 (Zemke et al., 1999), currently represents the majority of the workforce that is not part of the Baby Boomer cohort (Gursoy et al., 2008; Smola & Sutton, 2002), and the estimated size of that cohort is only 69.7 million (as of 2013) based on my calculations using the most current data (U.S. Census Bureau, 2014). While the next younger cohort, the Millennials, may rival or even surpass the Baby Boomers in terms of numbers (Bracy, Bevill, & Roach, 2010), the oldest members have only recently entered the workforce. As a result, many organizations may lose large percentages of their workers, potentially representing those with the most accumulated experience and skill, and be left with an insufficiently smaller pool of workers with comparable experience with which to replace them, at least until the labor pool is "refreshed" with the entry of larger numbers of the Millenials.

I chose to focus on the job design/job enrichment variables proposed by the Job Characteristics Model (Hackman & Oldham, 1976, 1980) as possible factors that are modifiable by an organization that might influence intended retirement timing, with the objective of identifying potential ways in which employers might be able to encourage employees to extend their careers by postponing their exit from the workforce.

I modified this study's original design due to a finding that arose from the univariate analysis stage. Many studies have employed the Job Characteristics Model's (Hackman & Oldham, 1976, 1980) five-factor structure and have, thus, operationalized the level of job enrichment by combining the scores for task variety, task identity, task significance, autonomy, and feedback into a single Motivating Potential Score (MPS), using either the multiplicative

formula originally proposed or a simplified additive formula. However, the existence of a body of work (Fried & Ferris, 1986, 1987) that calls the five-factor solution into question, led me to conduct a factor analysis of the Job Diagnostic Survey (Hackman & Oldham, 1976, 1980) items purported to make up the five characteristics indices. The factor analysis suggested a two-factor solution, which I subsequently identified as consisting of the level of meaningful engagement present in the job (the *MeaningfulEngage* factor), and the level of direct control over the methodology of a whole piece of work put into the hands of the worker (the *JobControl* factor). While it may be possible to combine these two factors into an overall motivating potential score similar to the MPS, the research necessary to develop that score was beyond the scope of this study. As a result, I evaluated the two job characteristics factors as individual independent variables of interest within the ordinal regression model. This led me to modify and split the two hypotheses originally proposed into the following final hypotheses, which are expressed in the direction-neutral form in light of my use of the more conservative two-tailed test in my analysis:

H1a: A change in the level of the job's meaningful engagement (the *MeaningEngage* factor) will correlate with a change in the probability of intending to retire *earlier* than normal retirement age, as defined by the Social Security Administration.

H1b: A change in the level of control over one's work (the *JobControl* factor) will correlate with a change in the probability of intending to retire *earlier* than normal retirement age, as defined by the Social Security Administration.

H2a: A change in the level of the *MeaningEnage* factor will correlate with a change in the probability of intending to retire *later* than normal retirement age, as defined by the Social Security Administration.

H2b: A change in the level of the *JobControl* factor will correlate with a change in the probability of intending to retire *later* than normal retirement age, as defined by the Social Security Administration.

The ordinal regression model offers strong support for all four hypotheses. Hypotheses H1a and H2a are supported by the finding that *MeaningEngage* has an odds ratio of 1.248 at the 99% confidence level. As the level of the *MeaningEngage* job characteristic factor increases by one unit, all other things being equal, the odds of *RetTime* being after age 68, which is the highest category, are 1.248 times, or approximately 25%, greater than the odds of being at any of the lower categories. This supports hypothesis H1a. The odds ratio can also be interpreted to mean that the odds of *RetTime* being age 61 or earlier, which is the lowest category, are 1.248, or 25%, less than the odds of being at any of the higher categories. This supports hypothesis H2a.

The odds ratio for *JobControl* is 1.192 at the 99% confidence level, which indicates that as the level of the *JobControl* factor increases by one unit, all other things being equal, the odds of *RetTime* being after age 68 are 1.192, or approximately 19% greater than the odds of being at any of the lower categories, which supports hypothesis H1b. This also means that a one unit increase in *JobControl*, all other things being equal, is associated with the odds of intending to retire at age 61 or earlier being 1.192, or approximately 19%, less than the odds of intending to retire at any of the higher categories supports hypothesis H2b.

In this study, the levels of the *MeaningEngage* factor ranged from a minimum value of approximately -4.7 to a maximum value of approximately 1.8. The range between the minimum and maximum values is approximately 6.5 units. To calculate the total possible increase in the odds ratio, I raise the odds ratio for a one unit change by the total possible number of units (Long & Freese, 2006). Thus, $1.248^{6.5}$ equals approximately 4.22. Subtract 1, as we are interested in the

overall increase in the odds ratio, and we find that raising the level of meaningful engagement from its minimum to its maximum level increases the odds of retiring after age 68 by a factor of 3.22, or 322% greater than the odds of retiring at any earlier range. The range of values for *JobControl* is approximately 5.8 units, with a minimum of approximately -4.18 and a maximum of 1.62. Thus, $1.192^{5.8} - 1$ equals approximately 1.77, which suggests that moving from minimum to maximum levels of one's control over their job gives odds of intending to retire after age 68 that are approximately 1.77 times, or 177%, greater than the odds of intending to retire at any earlier point.

These relatively high strength of influence associated with these two job characteristic factors suggests that job enrichment efforts aimed at increasing the levels of meaningful engagement and job control may offer an effective approach toward influencing employees' retirement timing decisions in such a way that they may plan to retire at a point in time later than they would if their jobs were not so enriched. The size of the sample and its close parity with the population from which the sample was drawn suggest that these results should be generalizable to that larger population, the Pennsylvania State System of Higher Education. While this cross-sectional study cannot establish causality for this relationship, there is no apparent mechanism that would suggest a reverse causal relationship, where intended retirement timing influenced the levels of the job characteristics. It is, of course, possible that both the job characteristics factors and intended retirement timing are being influenced by some other variable or variables, and that may be fertile ground for future studies. However, there is some evidence in the literature for a relationship between job characteristics that are similar to meaningful engagement and job control, as conceptualized here, and retirement timing.

De Vos and Segers (2013) explored whether employee engagement mediated the relationship between career self-directedness and intended retirement timing. The study conceptualizes engagement according to the definition offered by Pitt-Catsouphes and Matz-Costa (2008), which described it as "a state where employees find meaning in their work and devote discretionary effort and time to work (De Vos & Segers, 2013, p. 159; Pitt-Catsouphes & Matz-Costa, 2008, p. 216). Based on that definition, it is reasonable to conclude that the meaningful engagement job characteristic derived, in the current study, from the factor analysis of the Job Diagnostic Survey (Hackman & Oldham, 1976, 1980), is closely related to the employee engagement construct. De Vos and Segers (2013) found that the relationship between self-directedness and intended retirement timing was fully mediated by engagement and career self-management behaviors. While the current study did not explore a possible mediating role for meaningful engagement, De Vos and Segers' findings appear to support my finding that an increase in meaningful engagement is related to an increased probability of intending to retire at a later point in time.

Elovainio et al. (2005) looked at possible correlations between Karasek's (1979) demand-control model constructs of job control and job demands and anticipated early retirement. Their definition of job control suggests that it is similar to the job control job characteristic factor identified in the current study. According to their definition, job control "involves the organization of work in terms of workers' authority to make decisions concerning their own activities and skill usage (decision authority or job decision latitude)" (Elovainio et al., 2005, p. 85). Their findings suggested that high levels of job control had a negative relationship to anticipated early retirement and, through an exploration of the interaction effects with job demands, that "low job control was more strongly associated with positive early retirement

thoughts among those having high job demands compared with those with low demands" (2005, p. 88). While the current study did not examine job demands, and assessed job control differently, the relationships between the two job control constructs and intended or anticipated retirement timing appear to be in agreement.

This study's finding that increased levels of meaningful engagement and job control are related to an increased probability of intending to retire later also appear to be congruent with the findings of some of the existing research discussed in Chapter 2. Kilty and Behling (1985) found evidence that early retirement was related to a lack of job control, along with a lack of interest in their work. Their research also demonstrated a negative relationship between the presence of autonomy and meaningfulness in a job and the intent to retire early. Brougham and Walsh (2009) found that employees who intended to retire early reported lower levels of autonomy, as well as lower levels of experienced meaningfulness, while Schmitt and McCune (1981), who employed a modified form of the Motivating Potential Score (Hackman & Oldham, 1976, 1980), found evidence that those who retire early tend to perceive their jobs to be less involving and challenging.

In examining the influence of the identified job characteristic factors combined with the final model's significant categorical variables, I found that under the respective influence of both *MeaningEngage* and *JobControl*, the probability of intending to retire at age 61 or earlier decreases for all categories of *SpouseRetCat* as the levels of the job characteristic factors increase. Conversely, as the levels of the job characteristic factors increase, the probability of intending to retire at age 68 or older increase for all categories of *SpouseRetCat*. In fact, the highest predicted probability for any *RetTime* category is 64.1% for intent to retire at age 68 or older when *SpouseRetCat* is also age 68 or older and *MeaningEngage* is at its maximum. In the

case of the influence of *JobControl*, the probability of intending to retire at age 68 or older is 62.1%, again when *SpouseRetCat* is also age 68 or older. This is the second highest predicted probability for any *RetTime* category. It seems clear that *SpouseRetCat* has a strong positive relationship with *RetTime*, at least for those categories where the respondent is married and expressed an intended retirement time for their spouse. It also seems clear that increased levels of either job characteristic factor exerts additional influence on the *RetTime* outcome probabilities, even for those categories of *SpouseRetTime* that represent unmarried individuals or individuals who are married but for whom no intended spouse retirement time was reported. Given this evidence, there is additional support for considering job enrichment modifications that serve to increase both meaningful engagement and job control as potential approaches for influencing employees' intention to retire at later points in time. More so, the particularly strong predicted probabilities of intending to retire at age 68 or older, at high levels of both characteristics when the spouse's intended retirement time is also age 68 or older, suggest that such initiatives may exhibit a "spillover" effect to other organizations that have not taken such action. As an employee at an organization employing such interventions shifts their intended retirement time to a later age under the influence of the increased levels of the positive job characteristics, they may end up exerting influence on their spouses at other organizations, even in the absence of those interventions. As Ekerdt (2010) noted, "retirement is perennially becoming something else" (p. 69) and it is entirely possible that retirement, rather than being an employee's response to an actual felt need, may, instead, be "a response to a cultural suggestion" (p. 69). This "spillover" effect may provide a mechanism through which the pressure on employees associated with the cultural norm of retirement is eventually lessened, allowing the retirement construct to transform in ways that might encourage continued labor force participation well after normal retirement

age is reached. This may have a significant positive impact on society as a whole, given Shultz and Henkens' (2010) claim that "extending people's working life is generally seen as a key element in dampening or curtailing the rising costs associated with an ageing population" (2010, p. 265).

The findings for employee job categories, represented by the variable *CollJobCat*, suggest that the only significant differences between groups are between Executives and Management versus Professionals. The influence of the meaningful engagement and job control job characteristics relative to those two groups suggests some interesting interpretations. The lowest levels of both job characteristics are associated with a higher probability of intending to retire at the earliest range, before age 61, for the Executives and Management category as compared to the Professionals category. As levels increase, the differences between the probabilities of intending to retire at that point decrease somewhat. At the highest levels of the job characteristics, the probability of intending to retire at the latest range, after age 68, is higher for the Professionals category versus the Executives and Management category. As levels decrease, the differences between the probabilities of intending to retire at that point decrease somewhat. This suggests that employees in the Executives and Management category may be slightly more sensitive to low levels of job enrichment and slightly less sensitive to high levels of the same. It seems probable that this finding reflects the likely reality that such positions are normally associated with higher levels of complexity and autonomy, and thus higher levels of meaningful engagement and job control. Thus, a reduction in those factors is associated with an increased desire to retire early, as the job lacks elements that the people occupying them may expect. For professionals, these findings suggest that they may not have as high an expectation of meaningful engagement and job control. Thus, they do not react quite as strongly to lower levels

of meaningful engagement and control over their work, but react more strongly to increases in these job characteristics. For industries facing an impending shortage of professionals, these findings may be particularly relevant to any efforts directed at retaining their existing labor force in order to ameliorate the effects of a declining supply of qualified candidates.

The relationship between expected access to health insurance and intended retirement timing, relative to the two job characteristic factors reflects what common sense would suggest is expected. Those who have a low expectation of access to health insurance if they retire before becoming eligible for Medicare coverage are less likely to retire early and more likely to retire late than those employees who have a high expectation of having post-retirement but pre-Medicare health insurance across all levels of both job characteristics. The extremes of the spectra for both characteristics seem to act to increase the spread of these differences, thus a high level of enrichment appears to have a greater impact on the intention to retire late for those for whom health insurance coverage is unlikely and a low level has a greater impact on the intention to retire early for those for whom coverage is likely. What bears watching, however, is the potential impact on these observed relationships of the increased access to health care associated with the Affordable Care Act (ACA) and the expansions of the Medicare program. If these modifications to the U.S. healthcare insurance system are successful in increasing access to affordable healthcare, there may be far fewer respondents who would indicate that their future access to healthcare was extremely unlikely or unlikely, and far more who would indicate that their future access was likely or extremely likely. This would potentially minimize or eliminate the statistically significant differences between the extremes of the spectrum. As the ACA essentially mandates that individuals must have health insurance coverage, anticipated access to coverage may no longer play a significant role in predicting intended retirement timing. In fact,

if the ACA is able to deliver on the promise of increased access to health insurance at affordable rates, regardless of employment status, it could actually serve to encourage employees to more willingly consider retiring before the normal retirement age. Certainly the impact of the ACA on retirement behavior deserves further investigation in the coming years.

As for the two-way and three-way interactions included in the model, the most significant finding was that the job characteristics were a generally weak influence on intended retirement timing, regardless of their level, relative to the fairly strong influence of the interaction of gender and age and the interaction of retirement plan type, age, and the employees' years in their current position. In most cases the differences between the minimum, median, and maximum levels of the job characteristic factors exhibited minimal differences. The one interesting exception was for the probability for women's intent to retire at age 66 to 67, which seemed markedly lower for the lowest levels of the job characteristics factors. In all other areas of the analysis, lower levels of enriching characteristics were associated with higher probabilities of retiring at earlier ranges and lower probabilities of retiring at later ranges. The finding that women exhibit a markedly lower probability to retire at the normal retirement age range, coupled with a much higher probability of retiring at age 62 to 65, regardless of job characteristics levels, may suggest that the range of age 66 to 67 actually represents a late retirement for many women. This conjecture would appear to be supported by the studies discussed in Chapter 2 that found that husbands are more likely than wives to work full time after age 62 and after age 65 (Pienta & Hayward, 2002) and that "husbands seem to postpone their retirement until their wives reach Social Security or pension eligibility, whereas wives' retirement is more subject to the couple's overall economic situation" (Szinovacz & DeViney, 2000, p. 489).

The findings that meaningful engagement and job control appear to have a strong influence over intended retirement timing do not, by themselves, explain the potential mechanism behind that relationship. In an effort to make sense of those findings, it may be useful to consider some of the factors that underlie individuals' preferences for either continuing to work past retirement age or exiting the workforce through retirement.

Barnes-Farrell (2003) explains that there are several studies grounded in life span theory that suggest "individuals will prefer the role (work or retirement) that allows them to maintain a sense of personal control over their lives" (p. 161). Work, then, will seem preferable if it "is seen as a domain in which the worker has considerable control over both process and outcomes" (2003, p. 161). Described in that way, there appears to be a strong linkage to the characteristic of job control, which this study identified as one factor that exhibited a negative relationship with the probability of retiring early and a positive relationship with retiring late. Other studies, discussed in Chapter 2, found that delayed retirement was positively related to the complexity of the work (Hayward, Friedman, and Chen, as cited in Szinovacz, 2003) and whether or not the job was perceived as "interesting" (Parkinson, as cited in Smyer & Pitt-Catsouphes, 2007), while early retirement was predicted in part by the perception by employees that their job lacked challenge or didn't provide much involvement (1981). Additionally, Beehr (1986) characterized aspects of work that were negative as exerting a "push" toward retirement and aspects of retirement that were perceived as positives as exerting a "pull" toward retirement. Collectively, these findings, and others discussed previously, suggest that the relationship between meaningful engagement and job control and retirement timing identified in this study may be understood by drawing upon the precepts of social exchange theory (Homans, 2007).

Nye (as cited in Robbins, McDonell, Strom-Gottfried, Burton, & Yaffe Kjosness, 2006) summarized the essential elements of social exchange theory by distilling the perspective of the theory's many contributors into a listing of 12 propositions, several of which serve to shed some light on the likely mechanism that explains the relationship between meaningful engagement and job control and intended retirement timing identified in this study. First, the proposition that "individuals choose those alternatives from which they expect the most profit" (2006, p. 366) suggests that high levels of meaningful engagement and job control may be perceived as being more valuable than the "return" employees might associate with entering retirement. This may be, in part, because employees perceive fairly significant switching costs in transitioning to retirement, which is in keeping with the proposition that "rewards being equal, they choose alternatives from which they anticipate the fewest costs" (2006, p. 366). The costs, in this case, may include the loss of well-established work-based social networks, the potential need to be more vigilant in managing one's income once it becomes "fixed", or even the anticipated difficulty in adjusting to retirement (Taylor & Shore, 1995). The contrasts between the unknowns of retired life versus the familiarity with working life appear to be reflected in two of Nye's (as cited in Robbins et al., 2006) social exchange theory propositions. When the costs and benefits of two alternatives are perceived as being similar, individuals "choose alternatives characterized by the least ambiguity in terms of expected future events and outcomes" (2006, p. 366) and "choose alternatives that offer the most security for them" (2006, p. 366). Thus, if employees perceive meaningful engagement and job control to be of value, believe transitioning to retirement will "cost" more than maintaining their current working state, and are interested in seeking security and avoiding ambiguity, social exchange theory would appear to offer an

explanation for why increased levels of positive job characteristics are negatively related to the probability of retiring early and positively related with the probability of retiring late.

Retirement, from thinking about it, to intending to do it, to actually leaving the workforce (completely or partially), is influenced by numerous personal factors and environmental forces, as described by Beehr's (1986) model of retirement. Of all of the factors and forces identified by Beehr, the only elements immediately accessible to organizations for manipulation are job characteristics. However, job characteristics is a broad term, potentially encompassing a great many factors, some of which may be identified and discussed across a variety of job types and others of which may apply to only narrow categories of jobs. In order to explore the influence of job characteristics on retirement timing in a way that offers maximum generalizability to the widest range of organizations and job types, it would seem, first, to be necessary to identify a job characteristics framework that is, itself, widely generalizable.

I chose to operationalize job characteristics through the lens of the Job Characteristics Model (Hackman & Oldham, 1976, 1980) in an attempt to base this study of the influence of job characteristics, or core job dimensions as they are referred to in the Job Characteristics Model (JCM), on a generalizable job characteristics framework. Although the a priori five factor solution specified by the JCM did not prove to be valid for the study's sample, the identified factors of meaningful engagement and job control do appear to be at least similar to job characteristics that influence retirement timing identified in several other studies across a variety of organizations and job types.

While a critical evaluation of the JCM (Hackman & Oldham, 1976, 1980) was not the intent of this study, the results appear to support the findings of existing research (Dunham, 1976; Fried & Ferris, 1986, 1987) that suggest the model may suffer from some misspecification

that leads to inconsistent results when applied in different settings. Apart from continued investigations into the potential influence of job characteristics on intended retirement timing, a re-examination of the JCM, and the Job Diagnostic Survey (Hackman & Oldham, 1975, 1980) used to collect and analyze JCM-related data, seems well warranted.

Even if the five-factor solution suggested by the JCM (Hackman & Oldham, 1976, 1980) proved valid and generalizable, it is still likely that the model does not exhaustively capture all job characteristics that may be related to retirement timing, whether generalizable across a wide range of jobs or not, including several for which evidence of a relationship already exists. As an example, the JCM does not address goal compatibility (Brougham & Walsh, 2005, 2007), which Beehr (Beehr, 1986) includes in his retirement model as an environmental factor. A more thorough investigation of the relationship between job characteristics and retirement timing may require a broader set of assessments, rather than relying on a single instrument through which to evaluate the level of job characteristics perceived to be present in a given job.

Regardless of the nature of future investigations, the current study does add to the literature that suggests certain job characteristics may be positively related to employees' decisions to delay retirement. As noted in Chapter 2, most studies of job characteristics and the retirement decision appear to look at various factors according to Beehr's "push/pull" conceptualization (1986), which characterized the environmental non-job factors as "pulling" employees away from continued employment and the environmental job factors as "pushing" employees towards retirement. This study adds support to the proposition that positive job characteristics can act to "pull" employees away from retirement and "push" them towards continued employment. This suggests that it may be necessary to expand Beehr's retirement model to include "push" and "pull" forces toward retirement and "push" and "pull" forces away

from retirement. A more comprehensive model that encompasses the dynamics of these potentially counteracting and reinforcing factors and forces may enhance our ability to assess the probabilities of employees' intentions to retire early, on time, or late, relative to the normal retirement age ranges defined by the Social Security Administration (Social Security Administration, 2006).

Limitations of the Study

As this study employed a cross-sectional design, it is not possible to make causal inferences from the data collected and analyzed as any apparent relationships are based on observations taken at a single point in time (Babbie, 2008). Thus, as Babbie, citing Bian, suggests, any attempt to establish causality would require additional future investigations.

The study population from which the sample was drawn also introduces several limitations to this study. The PASSHE employee base is over 85% white (Pennsylvania State System of Higher Education, 2011) and the sample was almost 88% white. As such it was impossible to analyze the possible influence of race and ethnicity on intended retirement timing in the final model, which greatly reduces the generalizability of the results to more diverse populations. Furthermore, over 78% of the sample was made up of the job categories Executives and Management (26.17%) and Professionals (52.33%), both of which consist of individuals who are generally highly educated. While these percentages may somewhat reflect the makeup of other institutions of higher education, they almost certainly are not in line with other types of organizations, which, again, reduces generalizability. However, as noted previously, the large sample size and the similarity between the composition of the sample and the composition of the overall PASSHE population does suggest that the findings of this study may be generalized to that population with a reasonable degree of confidence.

Finally, the decision to operationalize job characteristics through the lens of the Job Characteristics Model (Hackman & Oldham, 1976, 1980) using the Job Diagnostics Survey instrument was intended to enhance the potential for comparing the findings to other studies that use a similar approach. However, validity issues with the five-factor job characteristics structure specified by the JCM led me to abandon the use of the five-factor solution and the Motivating Potential Score derived from those factors. While the factor analysis of the JDS clearly indicated that this decision was appropriate, it did serve to greatly reduce the comparability of this study with many others that were able to incorporate the JCM as originally specified.

Directions for Future Research

Future research in this area would certainly benefit from longitudinal studies, especially as the retirement decision-making process is one that occurs over an extended period of time with the potential to be influenced by various events during the employees' work life. Additionally, a longitudinal design would allow analysis of how the levels of various job characteristics change over times, at least as they are perceived by the employee. Coupled with data about employees' progression through various positions within an organization over time, it may be possible to identify whether employees appear to seek elevated levels of positive job characteristics, especially as they age.

This results of this study also suggest that experimental designs that include manipulation of the identified job characteristic factors may help substantiate the apparent relationships observed. It seems likely that natural experiments may also be an option, assuming one can identify an organization about to engage in a program of job enrichment and collect data before and after the implementation of those initiatives. It might be possible in such designs to compare the changes in intended retirement timing between jobs that are enriched versus those that are

not, assuming that the enrichment initiatives are implemented in a targeted fashion at certain job classifications or divisions, as opposed to an across-the-board approach.

This study also suggests research pathways that are not directly concerned with intended retirement timing. The validity issues with the Job Diagnostic Survey (Hackman & Oldham, 1976, 1980), and the associated implications for the validity of the Job Characteristics Model identified by existing research (Fried & Ferris, 1986, 1987) and evident with this study's sample suggest that further testing of the JCM and JDS, especially with samples drawn from different populations, may enhance the utility of those otherwise well-established theoretical frameworks.

Finally, the results of this study illuminate the need to continue to explore other potential predictors of intended retirement timing, including, but not limited to, other job characteristics drawn from other theoretical foundations. Additionally, it may be informative to assess whether employees' anticipated job characteristics, such as the potential for future promotions, improved compensation, or other expected job-related changes are related to their intended retirement timing.

Recommendations for Policy and Practice

In spite of its limitations, this study suggests that organizations may be able to exert some influence on their employees' intended timing of retirement by employing job enrichment techniques. Redesigning jobs to increase the variety of the required skills, building feedback into the work processes, and effectively communicating the significance of the work being done to the worker while increasing their autonomy should serve to increase the perceived levels of meaningful engagement, which this study suggests may increase the probability that an employee will intend to retire at a later point in time. Redesigning jobs around whole and

complete tasks with increased autonomy should increase the sense of job control, which may have the same effect, although to a slightly lesser extent, based on the findings of this study.

The concern over the implications for organizations of an aging workforce is global in nature (Kulik, Ryan, Harper, & George, 2014). Without any doubt, many of the initiatives to address the concerns over labor shortages and the increasing burden on the support systems for older individuals will be national or multi-national in scale. However, research regarding the impact of job design-based solutions, including job enrichment, offer the potential for organizations to exert some direct agency on the issues that most immediately impact their operations and opportunities for success. As many job enrichment techniques can be effected rapidly at relatively minimal cost, studies like this one have the potential to offer organizations avenues of action that they can explore even as they wait for larger social changes to go through the planning and implementation stages.

As noted in Chapter 2, Shultz and Henkens (2010) proposed that employers play an important role in both enabling retirement and continued employment for older workers. They concluded that any attempts to modify retirement behavior through policy changes is likely to be largely dependent on the "actions and attitudes" (2010, p. 266) of organizations. They also suggest that "extending people's working life is generally seen as a key element in dampening or curtailing the rising costs associated with an ageing population" (2010, p. 265). It would seem that the findings of this study suggest relatively easy to implement job modifications that might influence employees to delay retirement, thus extending their working life. Given Schultz and Henkens' (2010) assertion that the success of changes in social policy regarding retirement may be dependent on the ability of employers to enable both retirement and continued work for older employees, this study's results may allow organizations to act in ways that support the policy

changes that may be on the horizon. In doing so, they may be able to address any labor force issues they face as a result of the ongoing demographic changes while also helping address the real costs associated with those changes and act as a driving force in the shifting social norms regarding retirement.

Conclusions

Given the results of this study, there appears to be much that organizations might do to retain retirement eligible employees. Figure 31 represents my proposed model of the variables that influence intended retirement timing. As indicated in the figure, McKelvey & Zavoina's R^2 fit measure suggests that this model may explain just over half of the variance in the probabilities for the outcome of the dependent variable, intended retirement timing. Given the inherent complexity of the retirement process, this level of explained variance is notable. My model categorizes the variables influencing the outcome as current job factors, current personal factors, and anticipated personal factors. The model does not attempt to extend Beehr's (1986) "push/pull" characterization of the various influences on retirement timing given the complexity of the relationships demonstrated in this study. Nor does this model attempt to provide an exhaustive and definitive list of all possible influential variables and the direction of their relationship to retirement timing. Rather, this model is meant to serve as a framework for future research that may further inform our understanding of this complicated decision-making process. However, the model, and this study's findings, suggest some important considerations for organizations seeking the ability to encourage employees to work past their normal retirement age.

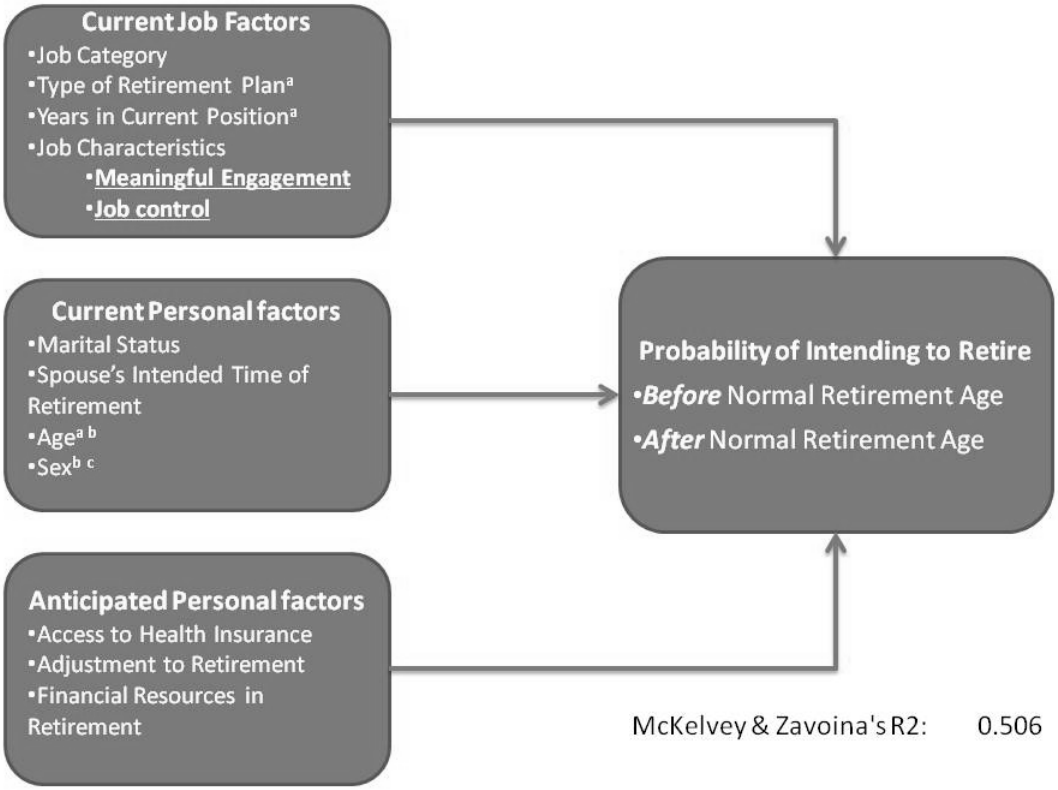

Figure 31. Proposed conceptual model of factors that influence retirement timing. Note: [a]Part of three-way interaction. [b]Part of two-way interaction. [c]Non-significant main effect.

At a fundamental level, this study suggests that organizations *do* have the ability to influence employees' intended retirement timing and that job enrichment techniques may be the mechanism through which that influence can be exerted. While employees ultimately have the agency of choice as to when to retire, if they are not forced to do so due to factors beyond their control, job characteristics appear to influence that choice. Of the factors described in the model depicted in Figure 31, the job characteristics of meaningful engagement and job control represent factors that are largely, if not entirely, under the control of the organization and this study indicates that increases in those two job characteristic factors are significantly associated with a decrease in the probability of retiring before normal retirement age and an increase in the probability of retiring after normal retirement age. As noted in the discussion of findings section,

increasing meaningful engagement from its minimum level to maximum increases the odds of retiring after age 68 by 322% versus any earlier age range, all other things being equal. Increasing job control from its minimum level to maximum increases the odds of retiring after age 68 versus any earlier age by 177%, all other things being equal. As the literature offers a wealth of insight as to how jobs may be enriched, organizations have at their disposal numerous empirically tested approaches for enriching jobs and, thus, powerful tools for decreasing the odds that their employees will choose to retire early and increasing the odds that their employees will extend their working life.

This study also suggests that organizations should be mindful of the influence of spouses' intended retirement timing on the intentions of their employees. Organizations that wish to encourage employees to remain on the job past retirement age must acknowledge that employees with spouses may be heavily influenced by their spouse's retirement plans. While organizations cannot feasibly influence spousal behavior, they may benefit from discussing intended spouse retirement timing with their employees. Such discussions may enable organizations to better predict which employees are most likely to extend their working life and which are most likely to choose to retire early or at the normal retirement age. It seems unlikely that any human resource departments collect data on intended spouse retirement timing. However, given the strong influence this variable has on employees' intended retirement timing, tracking spousal retirement plans may enhance various dimensions of human resource planning, including succession planning.

For many organizations, it seems likely that the retirement of employees whose jobs would fall under the category of "professionals" represents a particularly problematic loss. Professionals typically possess highly specialized knowledge-based skills that are usually honed

and refined over their years of work experience. As a result, the departure of such employees can represent a significant and difficult to replace knowledge loss to the organization. This research suggests that professionals react particularly strongly to increases in meaningful engagement and job control and are less sensitive to lower levels of those two factors, at least in comparison with employees whose jobs fall under the category of "executives and management." Thus efforts directed at increasing the levels of those job characteristics may be particularly efficacious in influencing employees in professional positions to delay retirement. For employees in executive and other managerial positions, this research suggests that they may be slightly more sensitive to lower levels of job enrichment and less sensitive to higher levels, which would suggest that organizations should guard against any perceived decrease in meaningful engagement or job control if they wish to retain those employees longer.

Finally, organizations may want to consider looking at their employees' retirement decision-making process through the lens of social exchange theory (Homans, 2007). If employees who choose to work beyond normal retirement age do so because they perceive the benefits of working outweigh the benefits of entering retirement and the costs of retirement outweigh the costs of continuing to work, it might be informative to try to understand just what costs and benefits employees associate with each option. Honest conversations with employees about the perceived costs and benefits of working and retirement may reveal other avenues through which organizations can influence employee retirement timing and thus improve their ability to retain valuable older workers. The results of such conversations may also inform future investigations of intended retirement timing.

References

Abramovitz, M. (1996). *Regulating the lives of women: Social welfare policy from colonial times to the present* (Rev. ed.). Boston, MA: South End Press.

Adams, G. A. (1999). Career-related variables and planned retirement age: An extension of Beehr's model. *Journal of Vocational Behavior, 55*(2), 221-235.

Adams, G. A., & Beehr, T. A. (1998). Turnover and retirement: A comparison of their similarities and differences. *Personnel Psychology, 51*(3), 643-665.

Adams, G. A., & Beehr, T. A. (2003). *Retirement: Reasons, processes, and results*. New York, NY: Springer.

Afshartous, D., & Preston, R. A. (2011). Key result of interaction models with centering. *Journal of Statistics Education, 19*(3), 1-24.

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes, 50*(2), 179-211.

Aldag, R. J., & Brief, A. P. (1979). Examination of a measure of higher-order need strength. *Human Relations, 32*(8), 705-718.

American Academy of Actuaries. (2012). Means testing for Social Security. *Issue Brief*. Retrieved from http://www.actuary.org/files/Means_Testing_SS_IB.pdf

Atchley, R.C. (1971). Retirement and leisure participation: Continuity or crisis? *The Gerontologist, 11*(1), 13-17.

Atchley, R.C. (1982). Retirement as a social institution. *Annual Review of Sociology, 8*(1), 263-287.

Babbie, E. R. (2008). *The basics of social research* (4th ed.). Belmont, CA: Thomson / Wadsworth.

Barnes-Farrell, J. L. (2003). Beyond health and wealth: Attitudinal and other influences on retirement decision-making. In G. A. Adams & T. A. Beehr (Eds.), *Retirement: Reasons, processes, and results* (pp. 159-187). New York, NY: Springer.

Beehr, T. A. (1986). The process of retirement: A review and recommendations for future investigation. *Personnel Psychology, 39*(1), 31-55.

Beehr, T. A., & Bennett, M. M. (2007). Examining retirement from a multi-level perspective. In K. S. Shultz & G. A. Adams (Eds.), *Aging and work in the 21st century* (pp. 277-302). Mahwah, NJ: Lawrence Erlbaum.

Beehr, T. A., Glazer, S., Nielson, N. L., & Farmer, S. J. (2000). Work and nonwork predictors of employees' retirement ages. *Journal of Vocational Behavior, 57*(2), 206-225.

Blekesaune, M., & Solem, P. E. (2005). Working conditions and early retirement. *Research on Aging, 27*(1), 3-30. doi:10.1177/0164027504271438

Bracy, C., Bevill, S., & Roach, T. D. (2010). *The Millennial generation: Recommendations for overcoming teaching challenges.* Paper presented at the Meeting of the Academy of Educational Leadership, Las Vegas, NV.

Brant, R. (1990). Assessing proportionality in the proportional odds model for ordinal logistic regression. *Biometrics*, 1171-1178.

Broderick, T., & Glazer, B. (1983). Leisure participation and the retirement process. *The American Journal of Occupational Therapy, 37*(1), 15-22.

Brougham, R. R., & Walsh, D. A. (2005). Goal expectations as predictors of retirement intentions. *The International Journal of Aging and Human Development, 61*(2), 141-160.

Brougham, R. R., & Walsh, D. A. (2007). Image theory, goal incompatibility, and retirement intent. *The International Journal of Aging and Human Development, 65*(3), 203-229.

Brougham, R. R., & Walsh, D. A. (2009). Early and late retirement exits. *International Journal of Aging & Human Development, 69*(4), 267-286.

Burkhauser, R. V., & Quinn, J. F. (1997). *Pro-work policy proposals for older Americans in the 21st century*. (Paper 34). Syracuse, NY, Syracuse University Center for Policy Research.

Champoux, J. E. (1980). A three sample test of some extensions to the job characteristics model of work motivation. *Academy of Management Journal, 23*(3), 466-478.

Champoux, J. E. (1991). A multivariate test of the job characteristics theory of work motivation. *Journal of Organizational Behavior, 12*(5), 431-446.

Chen, X., Ender, P. B., Mitchell M., & Wells, C. (2014). *Stata web books regression with Stata* Retrieved from http://www.ats.ucla.edu/stat/stata/webbooks/reg/chapter2/statareg2.htm

Coile, C. C., & Levine, P. B. (2009). The market crash and mass layoffs: How the current economic crisis may affect retirement: National Bureau of Economic Research.

Coile, C. C., & Levine, P. B. (2011). Recessions, retirement, and social security. *The American Economic Review, 101*(3), 23-28.

Costa, D. L. (1998). The evolution of retirement: Summary of a research project. *The American Economic Review, 88*(2), 232-236.

Cowell, E. L., & Kupritz, V. W. (2007). *Human resources and the future of communication in the workplace: A cross-generational perspective*. Paper presented at the College of Communication and Information 29th Annual Research Symposium, University of Tennessee.

Creswell, J. W. (2009). *Research design: Qualitative, quantitative, and mixed methods approaches* (3rd ed.). Thousand Oaks, CA: Sage.

Dahl, S. Å., Nilsen, Ø. A., & Vaage, K. (2003). Gender differences in early retirement behaviour. *European Sociological Review, 19*(2), 179-198.

De Vos, A., & Segers, J. (2013). Self-directed career attitude and retirement intentions. *Career Development International, 18*(2), 155-172.

Dennis, H., & Thomas, K. (2007). Ageism in the workplace. *Generations, 31*(1), 84-89.

Diamond, P. A., & Orszag, P. R. (2005). Saving Social Security. *Journal of Economic Perspectives, 19*(2), 11-32.

Doeringer, P. B., & Terkla, D. G. (1990). Business necessity, bridge jobs, and the nonbureaucratic firm. In P. B. Doeringer (Ed.), *Bridges to retirement: Older workers in a changing labor market* (pp. 146-168). Ithaca, NY: ILR Press.

Dunham, R. B. (1976). The measurement and dimensionality of job characteristics. *Journal of Applied Psychology, 61*(4), 404.

Ekerdt, D. J. (1986). The busy ethic: Moral continuity between work and retirement. *The Gerontologist, 26*(3), 239-244.

Ekerdt, D. J. (2010). Frontiers of research on work and retirement. *Journal of Gerontology: Social Sciences, 65B*(1), 69-80.

Ekerdt, D. J., Bosse, R., & Mogey, J. M. (1980). Concurrent change in planned and preferred age for retirement. *Journal of Gerontology, 35*(2), 232-240. doi:10.1093/geronj/35.2.232

Elovainio, M., Forma, P., Kivimäki, M., Sinervo, T., Sutinen, R., & Laine, M. (2005). Job demands and job control as correlates of early retirement thoughts in Finnish social and health care employees. *Work & Stress, 19*(1), 84-92.

Equal Employment Opportunity Commission. (2006). *EEO-1 instruction booklet*. (O.M.B. Publication No. 3046-0007). Washington, DC: O.M.B Retrieved from http://www.eeoc.gov/employers/eeo1survey/upload/instructions_form.pdf.

Evans, M. G., & Ondrack, D. A. (1991). The motivational potential of jobs: Is a multiplicative model necessary? *Psychological Reports, 69*(2), 659-672.

Flippen, C., & Tienda, M. (2000). Pathways to retirement: Patterns of labor force participation and labor market exit among the pre-retirement population by race, Hispanic origin, and sex. *Journals of Gerontology Series B, 55*(1), 14-27.

Franck, L. (2002). The cost to older workers: How the ADEA has been interpreted to allow employers to fire older employees based on cost concerns. *S. Cal. L. Rev., 76*, 1409.

Fried, Y., & Ferris, G. R. (1986). The dimensionality of job characteristics: Some neglected issues. *Journal of Applied Psychology, 71*(3), 419.

Fried, Y., & Ferris, G. R. (1987). The validity of the Job Characteristics Model: A review and meta analysis. *Personnel Psychology, 40*(2), 287-322.

Garr, E. (2009). Older Americans in the recession: More are staying in the workforce, more are losing their jobs. *Economic Policy Institute Issue Brief,* (251), 6. Retrieved from http://epi.3cdn.net/c8cd1b7008ed2a4fe2_ohm6bnava.pdf

Goda, G. S., Shoven, J. B., & Slavo, S. N. (2011). What explains changes in retirement plans during the great recession? *The American Economic Review, 101*(3), 29-34.

Graen, G. B., Scandura, T. A., & Graen, M. R. (1986). A field experimental test of the moderating effects of growth need strength on productivity. *Journal of Applied Psychology, 71*(3), 484.

Greller, M. M., & Simpson, P. (1999). In search of late career: A review of contemporary social science research applicable to the understanding of late career. *Human Resource Management Review, 9*(3), 309.

Gursoy, D., Maier, T. A., & Chi, C. G. (2008). Generational differences: An examination of work values and generational gaps in the hospitality workforce. *International Journal of Hospitality Management, 27*(3), 448-458.

Guthrie, J. P., & Schwoerer, C. E. (1996). Older dogs and new tricks: Career stage and self-assessed need for training. *Public Personnel Management, 25*, 59-72.

Hackman, J. R., & Oldham, G. R. (1974). The Job Diagnostic Survey: An instrument for the diagnosis of jobs and the evaluation of job redesign projects. New Haven, CT: Yale University.

Hackman, J. R., & Oldham, G. R. (1975). Development of the Job Diagnostic Survey. *Journal of Applied Psychology, 60*(2), 159.

Hackman, J. R., & Oldham, G. R. (1976). Motivation through the design of work: test of a theory. *Organizational behavior and human performance, 16*(2), 250-279.

Hackman, J. R., & Oldham, G. R. (1980). *Work redesign*. Reading, MA: Addison-Wesley.

Hagle, T. M., & Mitchell, G. E. (1992). Goodness-of-fit measures for probit and logit. *American Journal of Political Science*, 762-784.

Hamilton, L. C. (1992). *Regression with graphics: A second course in applied statistics*. Pacific Grove, CA: Brooks/Cole.

Hanisch, K. A., & Hulin, C. L. (1990). Job attitudes and organizational withdrawal: An examination of retirement and other voluntary withdrawal behaviors. *Journal of Vocational Behavior, 37*(1), 60-78.

Hanisch, K. A., & Hulin, C. L. (1991). General attitudes and organizational withdrawal: An evaluation of a causal model. *Journal of Vocational Behavior, 39*(1), 110-128.

Hayward, M. D. (1986). The influence of occupational characteristics on men's early retirement. *Social Forces, 64*(4), 1032-1045.

Herzog, A. R., House, J. S., & Morgan, J. N. (1991). Relation of work and retirement to health and well-being in older age. *Psychology and Aging, 6*(2), 202-211.

Homans, G. C. (2007). Social behavior as exchange. In C. Calhoun, J. Gerteis, J. Moody, S. Pfaff, & I. Virk (Eds.), *Contemporary sociological theory* (2nd ed., pp. 88-98). Malden, MA: Blackwell.

Honig, M. (1996). Retirement expectations: Differences by race, ethnicity, and gender. *The Gerontologist, 36*(3), 373-382. doi:10.1093/geront/36.3.373

Hosmer, D. W., & Lemeshow, S. (2000). *Applied logistic regression* (2nd ed.). New York, NY: Wiley.

Idaszak, J. R., & Drasgow, F. (1987). A revision of the Job Diagnostic Survey: Elimination of a measurement artifact. *Journal of Applied Psychology, 72*(1), 69.

Karasek Jr, R. A. (1979). Job demands, job decision latitude, and mental strain: Implications for job redesign. *Administrative science quarterly*, 285-308.

Kilty, K. M., & Behling, J. H. (1985). Predicting the retirement intentions and attitudes of professional workers. *Journal of Gerontology, 40*(2), 219.

Kohn, M. L., & Schooler, C. (1973). Occupational experience and psychological functioning: An assessment of reciprocal effects. *American Sociological Review*, 97-118.

Kohn, M. L., & Schooler, C. (1982). Job conditions and personality: A longitudinal assessment of their reciprocal effects. *American Journal of Sociology*, 1257-1286.

Kotlikoff, L. J. (1996a). Privatization of Social Security: How it works and why it matters. *Tax Policy and the Economy, 10*, 1-32.

Kotlikoff, L. J. (1996b). Privatizing Social Security at home and abroad. *The American Economic Review, 86*(2), 368-372.

Kubicek, B., Korunka, C., Hoonakker, P., & Raymo, J. M. (2010). Work and family characteristics as predictors of early retirement in married nen and women. *Research on Aging, 32*(4), 467-498. doi:10.1177/0164027510364120

Kulik, C. T., Oldham, G. R., & Langner, P. H. (1988). Measurement of job characteristics: Comparison of the original and the revised Job Diagnostic Survey. *Journal of Applied Psychology, 73*(3), 462.

Kulik, C. T., Ryan, S., Harper, S., & George, G. (2014). Aging populations and management. *Academy of Management Journal, 57*(4), 929-935.

Löckenhoff, C. E., Terracciano, A., & Costa Jr, P. T. (2009). Five-factor model personality traits and the retirement transition: Longitudinal and cross-sectional associations. *Psychology and Aging; Psychology and Aging, 24*(3), 722.

Long, J. S., & Freese, J. (2006). *Regression models for categorical dependent variables using Stata* (2nd ed.). College Station, TX: StataCorp.

Lussier, R. N. (2012). *Management fundamentals: Concepts, applications, skill development* (5th ed.). Mason, OH: South-Western.

Macnicol, J. (2006). *Age discrimination: An historical and contemporary analysis*. Cambridge, United Kingdom: Cambridge University Press.

McFall, B. H. (2011). Crash and wait? The impact of the great recession on the retirement plans of older Americans. *The American Economic Review, 101*(3), 40-44.

McMullin, J. A., & Marshall, V. W. (2001). Ageism, age relations, and garment industry work in Montreal. *Gerontologist, 41*(1), 111-122.

Mitchell, M. N. (2012). *A visual guide to Stata graphics* (3rd ed.). College Station, TX: Stata Press.

Ozawa, M. (2009). Social Security. In J. Midgley & M. Livermore (Eds.), *The handbook of social policy* (2nd ed., pp. 347-366). Thousand Oaks, CA: Sage.

Pang, G., Warshawsky, M., & Weitzer, B. (2010). The retirement decision: Current influences on the timing of retirement among older workers. In M. Micocci, G. Gregoriou, & G. Masala (Eds.), *Pension fund risk management: Financial and actuarial modeling*. Boca Raton, FL: Taylor and Francis.

Pennsylvania Department of Education. (2008). *College and university profiles* [Spreadsheet]. Retrieved from: http://www.portal.state.pa.us/portal/server.pt/community/statistics_detailed_tables/8690

Pennsylvania State System of Higher Education. (2011). Commonwealth of Pennsylvania State System of Higher Education factbook 2010-11 (pp. 82). Harrisburg, PA: PASSHE.

Peracchi, F., & Welch, F. (1994). Trends in labor force transitions of older men and women. *Journal of Labor Economics, 12*(2), 210-242.

Pienta, A. M., & Hayward, M. D. (2002). Who expects to continue working after age 62? The retirement plans of couples. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences, 57*(4), S199-S208.

Pitt-Catsouphes, M., & Matz-Costa, C. (2008). The multi-generational workforce: Workplace flexibility and engagement. *Community, work and Family, 11*(2), 215-229.

Piven, F. F., & Cloward, R. A. (1993). *Regulating the poor: The functions of public welfare* (Updated ed.). New York, NY: Vintage Books.

Quadagno, J. (1984). Welfare capitalism and the Social Security Act of 1935. *American Sociological Review, 49*(5), 632-647.

Quadagno, J. (1996). Social Security and the myth of the entitlement "crisis". *The Gerontologist, 36*(3), 391-399.

Quadagno, J. (2011). *Aging and the life course: An introduction to social gerontology* (5th ed.). Boston, MA: McGraw-Hill.

Quinn, J. F. (1978). Job characteristics and early retirement. *Industrial Relations, 17*(3), 315-323.

Ransom, R. L., & Sutch, R. (1986). The labor of older Americans: Retirement of men on and off the job, 1870-1937. *The Journal of Economic History, 46*(1), 1-30.

Reio Jr, T. G., & Sanders-Reio, J. (1999). Combating workplace ageism. *Adult Learning, 11*(1), 10-13.

Rentsch, J. R., & Steel, R. P. (1998). Testing the durability of job characteristics as predictors of absenteeism over a six-year period. *Personnel Psychology, 51*(1), 165-190.

Robbins, S. P., McDonell, J., Strom-Gottfried, K. J., Burton, D., & Yaffe Kjosness, J. (2006). Behaviorism, social learning, and exchange theory. In S. P. Robbins, P. Chatterjee, & E. R. Canda (Eds.), *Contemporary human behavior theory: A critical perspective for social work* (2nd ed., pp. 349-385). Boston, MA: Pearson, Allyn & Bacon.

Robinson, O. C., Demetre, J. D., & Corney, R. (2010). Personality and retirement: Exploring the links between the Big Five personality traits, reasons for retirement and the experience of being retired. *Personality and Individual Differences, 48*(7), 792-797.

Ruhm, C. J. (1996). Gender differences in employment behavior during late middle age. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences, 51*(1), S11.

Schaubroeck, J., & Williams, S. (1993). Type A behavior pattern and escalating commitment. *Journal of Applied Psychology, 78*(5), 862-867. doi:10.1037/0021-9010.78.5.862

Schirle, T. (2010). Health, pensions, and the retirement decision: Evidence from Canada. *Canadian Journal on Aging/La Revue canadienne du vieillissement, 29*(4), 519-527.

Schmitt, N., & McCune, J. T. (1981). The relationship between job attitudes and the decision to retire. *Academy of Management Journal, 24*, 795-802.

Schooler, C., Mulatu, M. S., & Oates, G. (1999). The continuing effects of substantively complex work on the intellectual functioning of older workers. *Psychology and Aging, 14*(3), 483.

Shultz, K. S., & Henkens, K. (2010). Introduction to the changing nature of retirement: an international perspective. *International Journal of Manpower, 31*(3), 265-270.

Smola, K. W., & Sutton, C. D. (2002). Generational differences: Revisiting generational work values for the new millennium. *Journal of Organizational Behavior, 23*(4), 363-382.

Smyer, M. A., & Pitt-Catsouphes, M. (2007). The meanings of work for older workers. *Generations, 31*(1), 23-30.

Social Security Administration. (2003). *Historical background and development of social security*. Retrieved from http://www.ssa.gov/history/briefhistory3.html.

Social Security Administration. (2006). *Normal retirement age*. Retrieved from http://www.ssa.gov/OACT/ProgData/nra.html.

Social Security Administration. (2009a). *The future of Social Security*. Retrieved from http://www.ssa.gov/pubs/10055.pdf.

Social Security Administration. (2009b). *Social Security handbook*. Retrieved from http://www.ssa.gov/OP_Home/handbook/.

Social Security Administration Office of Retirement and Disability Policy. (2010). *The future financial status of the Social Security program*. (Social Security Bulletin, Vol. 70 No. 3). Retrieved from http://www.ssa.gov/pubs/10055.pdf.

StataCorp. (2013). Stata Statistical Software (Version Release 13). College Station, TX: StataCorp.

Swan, G. E., Dame, A., & Carmelli, D. (1991). Involuntary retirement, Type A behavior, and current functioning in elderly men: 27-year follow-up of the Western Collaborative Group Study. *Psychology and Aging; Psychology and Aging, 6*(3), 384.

Szinovacz, M. E. (2003). Contexts and pathways: Retirement as institution, process, and experience. In G. A. Adams & T. A. Beehr (Eds.), *Retirement: Reasons, processes, and results* (pp. 6-52). New York, NY: Springer.

Szinovacz, M. E. (2006). Families and retirement. In L. O. Stone (Ed.), *New frontiers of research on retirement* (pp. 165-198). Ottawa, Canada: Statistics Canada.

Szinovacz, M. E., & DeViney, S. (2000). Marital characteristics and retirement decisions. *Research on Aging, 22*(5), 470-498.

Szinovacz, M. E., DeViney, S., & Davey, A. (2001). Influences of family obligations and relationships on retirement: Variations by gender, race, and marital status. *J Gerontol B Psychol Sci Soc Sci, 56*(1), S20-27.

Talaga, J. A., & Beehr, T. A. (1995). Are there gender differences in predicting retirement decisions? *Journal of Applied Psychology, 80*(1), 16-28.

Taylor, M. A., & Shore, L. M. (1995). Predictors of planned retirement age: An application of Beehr's model. *Psychology and Aging, 10*(1), 76-83.

Tiegs, R. B., Tetrick, L. E., & Fried, Y. (1992). Growth need strength and context satisfactions as moderators of the relations of the job characteristics model. *Journal of Management, 18*(3), 575.

U.S. Bureau of Labor Statistics. (2008). *Older Workers*. Retrieved from http://www.bls.gov/spotlight/2008/older_workers/pdf/older_workers_bls_spotlight.pdf.

U.S. Bureau of Labor Statistics. (2014). *Labor force statistics from the Current Population Survey*. Retrieved from http://www.bls.gov/cps/demographics.htm.

U.S. Census Bureau. (2012). *Statistical Abstract of the United States*. United States Government Printing Office.

U.S. Census Bureau. (2014). *Current Population Survey (CPS)*. Retrieved from http://www.census.gov/cps/.

UCLA Statistical Consulting Group. (2014). Stata Data Analyis Examples Ordered Logistic Regression. Retrieved from http://www.ats.ucla.edu/stat/stata/dae/ologit.htm

United States Government Accountability Office. (2007). *Retirement decisions: Federal policies offer mixed signals about when to retire*. Retrieved from http://www.gao.gov/new.items/d07753.pdf.

Williams, R. (2012). Using the margins command to estimate and interpret adjusted predictions and marginal effects. *Stata Journal, 12*(2), 308.

Windmeijer, F. A. G. (1995). Goodness-of-fit measures in binary choice models 1. *Econometric Reviews, 14*(1), 101-116.

Wolfe, R., & Gould, W. (1998). An approximate likelihood-ratio test for ordinal response models. *Stata Technical Bulletin, 7*(42).

Xu, J., Kochanek, K. D., Murphy, S. L., & Tejada-Vera, B. (2010). Deaths: Final data for 2007. *Natl Vital Stat Rep, 58*(19), 1-136.

Yeatts, D. E., Folts, W. E., & Knapp, J. (2000). Older workers' adaptation to a changing workplace: Employment issues for the 21st century. *Educational Gerontology, 26*(6), 565-582.

Zemke, R., Raines, C., & Filipczak, B. (1999). *Generations at work: Managing the clash of Veterans, Boomers, Xers, and Nexters in your workplace*. New York, NY: Amacom Books.

Appendix A

Additional Survey Items

The following are additional survey items that were designed to collect data on planned retirement timing and various control and potentially intervening variables. These preceded the remainder of the survey, which consisted of sections one through six of the Job Diagnostics Survey (JDS), which can be found in the book *Work Redesign* (Hackman & Oldham, 1980, pp. 275-287) and was adapted for this study with the permission of the surviving author. I was not granted permission to reproduce the instrument here. The scoring key for the JDS is also available in *Work Redesign* (p. 303-306).

1. Please enter the year you were born using four digits (YYYY): _____
2. Please indicate your sex:
   - ○ Male
   - ○ Female
   - ○ Prefer not to answer
3. Please indicate your current marital status:
   - ○ Married
   - ○ Not married
   - ○ Prefer not to answer
4. Other than your partner or spouse, please use the dropdown box to select the number of dependents living with you for whom you provided greater than half of their support during the past year? _____

5. Please indicate your race and ethnicity:

○ Hispanic or Latino
○ White (Not Hispanic or Latino)
○ Black or African American (Not Hispanic or Latino)
○ Native Hawaiian or Other Pacific Islander (Not Hispanic or Latino)
○ Asian (Not Hispanic or Latino)
○ American Indian or Alaska Native (Not Hispanic or Latino)
○ Two or More Races (Not Hispanic or Latino)
○ Prefer not to Answer

6. Please enter the number of years you have held your current position in your current organization. If you have held your current position for less than one year, please enter your response as 1. _____

7. Are you currently a full-time employee?

○ Yes

○ No

8. Are you a member of faculty?

○ Yes

○ No

9. Have you been granted tenure? (*only asked if #8 is "Yes"*)

○ Yes

○ No

10. Please indicate which of the following job categories and descriptions best describes your current position:

Job Category	Brief Description
Executive/Senior Level Officials and Managers	Individuals who plan, direct and formulate policies, set strategy and provide the overall direction of enterprises/organizations for the development and delivery of products or services, within the parameters approved by boards of directors or other governing bodies.
First/Mid Level Officials and Managers	Individuals who serve as managers, other than those who serve as Executive/Senior Level Officials and Managers, including those who oversee and direct the delivery of products, services or functions at group, regional or divisional levels of organizations.
Professionals	Most jobs in this category require bachelor and graduate degrees, and/or professional certification. In some instances, comparable experience may establish a person's qualifications
Technicians	Jobs in this category include activities that require applied scientific skills, usually obtained by post secondary education of varying lengths, depending on the particular occupation, recognizing that in some instances additional training, certification, or comparable experience is required.
Sales Workers	These jobs include non-managerial activities that wholly and primarily involve direct sales.
Administrative Support Workers	These jobs involve nonmanagerial tasks providing administrative and support assistance, primarily in office settings.
Craft Workers	Most jobs in this category includes higher skilled occupations in construction. This category also includes occupations related to the installation, maintenance and part replacement of equipment, machines and tools.
Operatives	Most jobs in this category include intermediate skilled occupations and include workers who operate machines or factory-related processing equipment. This category also includes occupations of generally intermediate skill levels that are concerned with operating and controlling equipment to facilitate the movement of people or materials.
Laborers and Helpers	Jobs in this category include workers with more limited skills who require only brief training to perform tasks that require little or no independent judgment.
Service Workers	Jobs in this category include food service, cleaning service, personal service, and protective service activities. Skill may be acquired through formal training, job-related training or direct experience.

11. I expect to retire at :

○ Age 61 or earlier

○ Age 62 to 65

○ Age 66 to 67

○ Age 68 or older

12. My spouse expects to retire at:

○ Age 61 or earlier

○ Age 62 to 65

○ Age 66 to 67

○ Age 68 or older

○ Not applicable

13. Please indicate the retirement plan in which you are enrolled:

○ State Employees' Retirement System (SERS)

○ Public School Employees' Retirement System (PSERS)

○ Alternative Retirement Plan (ARP, which includes plans administered by Fidelity Investments, ING, TIAA-CREF, or VALIC)

○ Other plan not listed

○ None

14. What is the likelihood that your payouts from retirement plans (e.g., IRA, 401k, 403b, and/or pension) and social security will be adequate to your needs after retirement?

1	2	3	4	5
Extremely Unlikely	Unlikely	Neutral	Likely	Extremely Likely

15. What is the likelihood that you will be financially comfortable past retirement?

1	2	3	4	5
Extremely Unlikely	Unlikely	Neutral	Likely	Extremely Likely

16. Please rate your overall physical health.

1	2	3	4	5
Poor	Fair	Good	Very Good	Excellent

17. What is the likelihood that your level of health will allow you to work as long as you wish?

1	2	3	4	5
Extremely Unlikely	Unlikely	Neutral	Likely	Extremely Likely

18. What is the likelihood that, if you retired before you qualified for Medicare, you would have health insurance coverage?

1	2	3	4	5
Extremely Unlikely	Unlikely	Neutral	Likely	Extremely Likely

19. Please indicate the degree to which you disagree or agree with each of the following statements regarding retirement:

I am confident that I will easily adjust to retirement.

1	2	3	4	5
Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree

I don't think that I will have any trouble handling retirement.

1	2	3	4	5
Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree

I expect to enjoy retirement.

1	2	3	4	5
Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree

When I imagine what retirement will be like, I feel depressed.

1	2	3	4	5
Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree

Note. The survey continued from this point with sections one through six of the Job Diagnostic Survey (Hackman & Oldham, 1980, pp. 275-287).

Appendix B

Informed Consent Letter

Informed Consent Form

Procedures
The questionnaire that follows will first ask you to answer some brief questions about you and your job. You will then be asked to answer some questions about retirement, followed by a series of questions that ask about various characteristics of your job. Completing the survey should take between 10 and 15 minutes.

Risks
There are no known risks or discomforts associated with this research.

Benefits and Compensation
There are no direct benefits or compensation for participants. However, it is hoped that through your participation, the researcher will learn more about possible relationships between job characteristics and expected retirement timing.

Confidentiality
Your responses are entirely anonymous and will be added to those of other participants and analyzed together. It will be impossible to associate any set of responses with any particular individual. All data will be retained for at least three years in compliance with federal regulations.

Questions about the Research
If you have questions regarding this study, you may contact the principal investigator, Eric Ecklund. If you have questions you do not feel comfortable asking the researcher, you may contact Dr. Beth Mabry. The contact information for Mr. Ecklund and Dr. Mabry appears at the end of this Informed Consent Form.

Participation
Participation in this research study is completely voluntary. You have the right to withdraw at anytime or refuse to participate entirely without jeopardy of any kind to you or your job. If you desire to withdraw, please close your internet browser before completing the survey. You may receive several reminder emails regarding this survey in the weeks after it is first distributed. If you still choose not to participate, simply click the opt out link present in each message. The original list of email addresses used to distribute the surveys will be destroyed once the survey collection period has ended and no further emails will be sent after that point.

Eric Ecklund, ALS Doctoral Candidate at IUP
IUP Doctoral Candidate & Assistant Professor of Management, St. Francis University
e.s.ecklund@iup.edu
814-472-2867

Dr. Beth Mabry, Committee Chair
Associate Professor of Sociology
Indiana University of Pennsylvania
McElhaney Hall, Room 112E
Indiana, PA 15705
mabry@iup.edu
724-357-1289

I have read and understand the information on the form and I consent to volunteer to be a participant in this study. I understand that my responses are completely confidential and that I have the right to withdraw at any time. Completing and returning this survey implies my consent to participate.

This project has been approved by the Indiana University of Pennsylvania Institutional Review Board for the Protection of Human Subjects (Phone: 724/357-7730).

Appendix C

Additional Analysis

Table C1 displays the standard errors for the final ordinal logistic regression model both with normal standard errors and with robust standard errors. Based on the minimal differences between the standard errors, I did not use robust errors in this study.

Table C1

Ordinal Regression for Variables Predicting Probability of Intended Retirement Timing. Final Model Comparison: Normal Standard Errors and Robust Standard Errors

Variable	Normal SE	Robust SE
LocationNUM		
California	0.201	0.212
Cheyney	0.976	1.073
Clarion	0.241	0.253
East Stroudsburg	0.446	0.458
Edinboro	0.253	0.275
Indiana	0.230	0.247
Kutztown	0.438	0.452
Lock Haven	0.323	0.359
Mansfield	0.164	0.173
Millersville	0.215	0.234
Off. of Chancellor	0.238	0.268
Shippensburg	0.309	0.335
Slippery Rock	0.221	0.235
SpouseRetCat		
SpouseRet_62 to 65	0.425	0.429
SpouseRet_66 to 67	2.035	1.961
SpouseRet_68 or older	10.413	12.288
SpouseRet_Single	0.701	0.748
SpouseRet_NA but married	1.357	1.412
Age by end 2013	0.014	0.014
Female	1.361	1.372
Years current pos.	0.032	0.033
CollJobCat		

JobCat_Professionals	0.264	0.270
JobCat_Admin Support	0.336	0.349
JobCat_Tech/Craft/Svc/Etc	0.315	0.304
DC Ret. Plan	4.727	4.927
HealthInsurance		
HealthIns_Unlikely	0.200	0.188
HealthIns_Neutral	0.128	0.125
HealthIns_Likely	0.082	0.079
HealthIns_Extremely Likely	0.082	0.082
Expected adjust. to ret.	0.045	0.046
Expected fin. health in ret.	0.060	0.064
MeaningEngage	0.088	0.094
JobControl	0.080	0.082
Age by end 2013 # Years current pos.	0.001	0.001
DC Ret. Plan # Age by end 2013	0.014	0.014
Female # Age by end 2013	0.011	0.011
DC Ret. Plan # Age by end 2013 # Years current pos.	0.000	0.000

Table C2 displays the contrasts and *p* values for the pairwise comparisons of the *SpouseRetCat* categories, relative to each of the four outcomes of the dependent variable *RetTime*. As noted in the table, as the literature suggested that differences would exist between the various categories of *SpouseRetTime*, the less-restrictive Fishers Protected LSD test was used when evaluating the significance of the contrasts.

Table C2

Contrasts and P Scores for Pairwise Comparisons of Categories of SpouseRetCat for the Four Outcomes of the Dependent Variable RetTime

	RetTime Outcome(1)		*RetTime* Outcome(2)		*RetTime* Outcome(3)		*RetTime* Outcome(4)	
SpouseRetCat	Contrast	P>|z|	Contrast	P>|z|	Contrast	P>|z|	Contrast	P>|z|
2 vs 1	-.1357457	0.000	.0149714	0.089	.0576368	0.000	.0631375	0.000
3 vs 1	-.2865949	0.000	-.0785865	0.000	.1253855	0.000	.2397959	0.000
4 vs 1	-.3578769	0.000	-.2347041	0.000	.0974991	0.000	.4950819	0.000
5 vs 1	-.1968638	0.000	-.0021781	0.837	.0872093	0.000	.1118325	0.000
6 vs 1	-.2438355	0.000	-.0321008	0.081	.1094623	0.000	.166474	0.000
3 vs 2	-.1508492	0.000	-.0935579	0.000	.0677487	0.000	.1766583	0.000
4 vs 2	-.2221311	0.000	-.2496755	0.000	.0398623	0.008	.4319444	0.000
5 vs 2	-.061118	0.003	-.0171495	0.011	.0295725	0.004	.048695	0.003
6 vs 2	-.1080898	0.000	-.0470722	0.005	.0518255	0.000	.1033364	0.000
4 vs 3	-.071282	0.000	-.1561176	0.000	-.0278864	0.035	.255286	0.000
5 vs 3	.0897311	0.000	.0764084	0.000	-.0381762	0.000	-.1279633	0.000
6 vs 3	.0427594	0.057	.0464857	0.045	-.0159232	0.078	-.0733219	0.046
5 vs 4	.1610131	0.000	.232526	0.000	-.0102897	0.477	-.3832494	0.000
6 vs 4	.1140414	0.000	.2026033	0.000	.0119633	0.435	-.3286079	0.000
6 vs 5	-.0469717	0.043	-.0299227	0.083	.022253	0.041	.0546415	0.063

Notes: Outcomes for *RetTime* are:
1=Age 61 or earlier, 2=Age 62 to 65, 3=Age 66 to 67, 4=Age 68 or later.
Categories for *SpouseRetCat* are:
1=Age 61 or earlier, 2=Age 62 to 65, 3=Age 66 to 67, 4=Age 68 or later, 5=Single, 6=NA but married.
Fishers Protected LSD used to test for significance.

Table C3 displays the contrasts and *p* values for the pairwise comparisons of the *CollJobCat* categories, relative to each of the four outcomes of the dependent variable *RetTime*. As noted in the table, as the literature did not directly suggest that differences would exist between the various categories of *CollJobCat*, the more conservative Scheffé test was used when evaluating the significance of the contrasts.

Table C3

Contrasts and P Scores for Pairwise Comparisons of Categories of CollJobCat for the Four Outcomes of the Dependent Variable RetTime

	RetTime Outcome(1)		*RetTime* Outcome(2)		*RetTime* Outcome(3)		*RetTime* Outcome(4)	
CollJobCat	Contrast	P>|z|	Contrast	P>|z|	Contrast	P>|z|	Contrast	P>|z|
2 vs 1	-.0804404	0.000	-.0169992	0.001	.0281758	0.001	.0692637	0.000
3 vs 1	-.0631291	0.116	-.0109161	0.391	.0222676	0.114	.0517776	0.154
4 vs 1	-.0289337	0.864	-.003041	0.941	.0102599	0.865	.0217148	0.878
3 vs 2	.0173113	0.898	.006083	0.879	-.0059082	0.902	-.0174862	0.890
4 vs 2	.0515067	0.429	.0139581	0.158	-.0179159	0.453	-.0475489	0.330
4 vs 3	.0341954	0.808	.0078751	0.776	-.0120077	0.810	-.0300627	0.795

Notes: Outcomes for *RetTime* are:
1=Age 61 or earlier, 2=Age 62 to 65, 3=Age 66 to 67, 4=Age 68 or later.
Categories for *CollJobCat* are:
1=Exec and Mgmt, 2=Professionals, 3=Admin Support, 4=Tech/Craft/Svc/Etc
Scheffé used to test for significance.

Table C4 displays the contrasts and *p* values for the pairwise comparisons of the *HealthInsurance* categories, relative to each of the four outcomes of the dependent variable *RetTime*. As noted in the table, as the literature did not directly suggest that differences would exist between the various categories of *CollJobCat*, the more conservative Scheffé test was used when evaluating the significance of the contrasts.

Table C4

Contrasts and P Scores for Pairwise Comparisons of Categories of HealthInsurance for the Four Outcomes of the Dependent Variable RetTime

	RetTime Outcome(1)		*RetTime* Outcome(2)		*RetTime* Outcome(3)		*RetTime* Outcome(4)	
HealthInsurance	Contrast	P>|z|	Contrast	P>|z|	Contrast	P>|z|	Contrast	P>|z|
2 vs 1	.031189	0.794	.0285171	0.847	-.0089463	0.747	-.0507598	0.832
3 vs 1	.0799214	0.050	.05632	0.232	-.0268345	0.032	-.1094069	0.138
4 vs 1	.1307675	0.000	.0701464	0.065	-.0467983	0.000	-.1541156	0.005
5 vs 1	.141579	0.000	.0715587	0.057	-.0510203	0.000	-.1621175	0.004
3 vs 2	.0487324	0.245	.0278029	0.295	-.0178882	0.270	-.0586471	0.251
4 vs 2	.0995786	0.000	.0416292	0.013	-.0378521	0.000	-.1033558	0.000
5 vs 2	.1103901	0.000	.0430416	0.010	-.042074	0.002	-.1113577	0.001
4 vs 3	.0508462	0.174	.0138264	0.422	-.0199639	0.198	-.0447087	0.227
5 vs 3	.0616576	0.214	.0152387	0.344	-.0241858	0.234	-.0527106	0.213
5 vs 4	.0108115	0.993	.0014123	0.992	-.0042219	0.993	-.0080019	0.993

Notes: Outcomes for *RetTime* are:
1=Age 61 or earlier, 2=Age 62 to 65, 3=Age 66 to 67, 4=Age 68 or later.
Categories for *HealthInsurance* are:
1=Extremely Unlikely, 2=Unlikely, 3=Neutral, 4=Likely, 5=Extremely Likely
Scheffé used to test for significance.

Appendix D

Permission To Use The Job Diagnostic Survey Instrument

SAINT FRANCIS UNIVERSITY
FOUNDED 1847

August 11th, 2013

Greg R. Oldham
A. B. Freeman School of Business
Goldring/Woldenberg Hall
7 McAlister Drive
Tulane University
New Orleans, LA 70118

Dear Dr. Oldham,

Thank you so much for your quick response to my request. This letter will confirm our recent email conversation. As I noted, I am completing a doctoral dissertation at Indiana University of Pennsylvania entitled "Core Job Dimensions as Predictors of Intended Retirement Timing." I would like your permission to use the Job Diagnostic Survey instrument (see full citation below) for my research and to reprint in my dissertation.

Hackman, J. R., & Oldham, G. R. (1974). The Job Diagnostic Survey: An Instrument for the Diagnosis of Jobs and the Evaluation of Job Redesign Projects. New Haven, CT: Yale University, Department of Administration Science.

The requested permission extends to any future revisions and editions of my dissertation, including non-exclusive world rights in all languages, and to the prospective publication of my dissertation by UMI Dissertation Publishing. These rights will in no way restrict republication of the material in any other form by you or by others authorized by you.

If these arrangements meet with your approval, please sign this letter where indicated below and return it to me in the enclosed return envelope. Thank you very much.

Sincerely,

Eric Ecklund

PERMISSION GRANTED FOR THE USE REQUESTED ABOVE:

Greg R. Oldham

Conditions, if any: You have permission to use the JDS, but not to reprint it in your dissertation.

Date: 8-16-13

Please use the following citation
Hackman, J.R., & Oldham, G.R. (1980). Work redesign. Reading, MA Addison-Wesley

School of Business
P.O. Box 600, Loretto, PA 15940-0600 Phone: (814) 472-3087 Fax: (814) 472-3174
www.francis.edu