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Job design factors in the workplace that support successful aging for older workers

Martha J. Sanders
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COLLEGE OF HEALTH SCIENCES

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2009

ABSTRACT

Job Design Factors in the Workplace that Support
Successful Aging for Older Workers

by

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M.S., University of New Haven, 2004

M.A., University of Southern California, 1992

B.S., Tufts University, 1979

Dissertation Proposal Submitted in Partial Fulfillment
of the Requirements for the Degree of
Doctor of Philosophy
College of Social and Behavioral Studies

Walden University
June, 2009

ABSTRACT

Increasing numbers of older adults are expected to return to the labor force to reap both the financial and social rewards of paid employment. However, little is known about how the workplace supports older workers' successful aging process. The purpose of this study was to examine how the design of a job (opportunities for decision making, use of a variety of skills, coworker support, and supervisor support) influences successful aging (having a sense of control over life, social networks, emotional support, and opportunities for generativity) in older workers (aged 55 and older) in the home building industry. The study explored the relationship between two broad constructs: a model of successful aging and the demand control model of healthy job design. In a cross-sectional, survey design, a convenience sample of 109 older workers completed the Job Content Questionnaire, Social Network scale, Emotional Support scale, Mirowsky-Ross 2 X 2 Index of Sense of Control, and Loyola Generativity Scale. Results of multiple regression analyses indicated that job design influenced two measures of successful aging: generativity and personal sense of control. Job design contributed to 23% of the variance in generativity and 15.5% of the variance in personal sense of control. The job design characteristics of skill variety and coworker support were most important to successful aging. It was recommended that managers design jobs for older workers that incorporate opportunities to use a variety of skills, work collaboratively with others, and offer mentoring experiences. This study contributes to social change by promoting the workplace as a naturally occurring social institution that supports successful aging for older workers.

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DEDICATION

This dissertation is dedicated to the older workers in my study who shared their time, their thoughts, and their perspectives with me so that I could learn from their life experiences. Their enthusiasm and openness made the process of engaging with each one of them enjoyable.

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I express my thanks to my family, my brothers, sister, and Dad who fully expected me to complete the doctoral process even before I began. Their enthusiasm, curiosity, and support have been truly appreciated during this process. I also thank from the bottom of my heart the daily emotional support given by Walden colleagues who have endured this process with me. Their reflection, listening ears, and constant optimism made the process both a professional and personal source of fulfillment.

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CHAPTER 1:
INTRODUCTION TO THE STUDY

Background

The number of older adults in the United States will reach 70 million by the year 2030 and will comprise greater than 20% of the population according to the U. S. Census Bureau (2002). For the purposes of this study, older adults refer to individuals aged 55 and older as designated by labor and census demographics (Bureau of Labor Statistics [BLS], 2006; U. S. Census Bureau). Whereas disability was once an inevitable consequence of older adulthood, contemporary generations of older adults demonstrate good health, cognition, and higher activity levels than previous generations (Au, Seshadri, Wolf, Elias, Elias, Sullivan, et al., 2004). Consequently, increasing numbers of older adults are remaining or returning to the labor force to reap both the financial and social rewards of paid employment (American Association of Retired Persons [AARP], 2003; Toosi, 2004).

In order to meet the psychosocial needs of this generation of older adults, gerontologists are seeking to understand the factors that contribute to successful aging in older adulthood. Paid employment is believed to promote successful aging by providing older adults with opportunities to socialize and engage in a productive activity (Rowe & Kahn, 1998). The specific characteristics of jobs that promote active engagement in work for older adults are just beginning to be examined. Wahlstedt, Nygard, Kemmlert, Torgen, and Bjorksten (2001) found that jobs organized in a work team format increase older workers' perceptions of support from coworkers more so than jobs organized in a

traditional hierarchical structure. Ross and Wright (1998) found that jobs characterized by opportunities for autonomy, decision-making, and task variety were associated with high levels of perceived personal control in workers of all ages. These studies suggest that the organization or design of the job influences the job experience and potentially the psychosocial health of older workers. However, the extent to which the job design contributes to the broad measures of successful aging in older workers necessitates further investigation. This study examined the extent to which workplace job design characteristics influenced perceptions of successful aging in older sales associates in the home building industry. Information from this study is intended to help older workers and businesses managers understand how jobs may be designed to optimize psychosocial needs in older workers.

Theoretical Approach

The concept of successful aging is being reexamined by society as lifespan increases. Whereas successful aging was traditionally associated with the biomedical definition of longevity of life (Bonder & Wagner, 2001), contemporary theories now emphasize the functional, cognitive, psychosocial, and adaptive qualities of individuals that create meaningful and productive lives in later years (Baltes & Baltes, 1990; Rowe & Kahn, 1998).

Rowe and Kahn's (1998) theory of successful aging proposes that individuals age optimally by maintaining high physical and cognitive functioning and through active engagement with life. Active engagement with life refers to continued involvement in social relationships, productive activities, and control over one's personal life choices

(Baltes & Baltes, 1990; Brandtstadter & Rothermund, 1994; Eizenman, Nesselrode, Fetherman, & Rowe, 1997; Kunzmann, Little, & Smith, 2002). Active engagement has also been interpreted as passing along wisdom to younger generations (Erikson, 1997; McAdams & de St. Aubin, 1992).

Occupational health theories also emphasize the importance of social support and personal control in the design of healthy jobs (Quick & Tetrick, 2003). The demand control model (DCM) suggests that control over one's job, social support, and opportunities to use a variety of skills in the workplace are important to workers' psychosocial and physical health (Karasek & Theorell, 1990; Warren, Dillon, Morse, Hall, & Warren, 2000). The DCM predicts adverse health effects for workers whose jobs are characterized by high productivity demands and few opportunities for decision making, skill variety, and social support. The model further suggests that engagement in active jobs (those characterized by high job demands and high job control) are more psychologically healthy than passive jobs (those with low productivity demands and little opportunity to control one's job) for all workers (Karasek & Theorell).

Given the similarity of the core theoretical concepts of successful aging and healthy work, it would appear that a healthy work organization could be realistically viewed as a vehicle to promote successful aging in older workers, particularly if opportunities for generative experiences exist in the social milieu of the workplace. Figure 1 identifies the intersection of these two theories and the proposed relationship between individual variables. This study explored the extent to which job design characteristics influenced perceptions of successful aging.

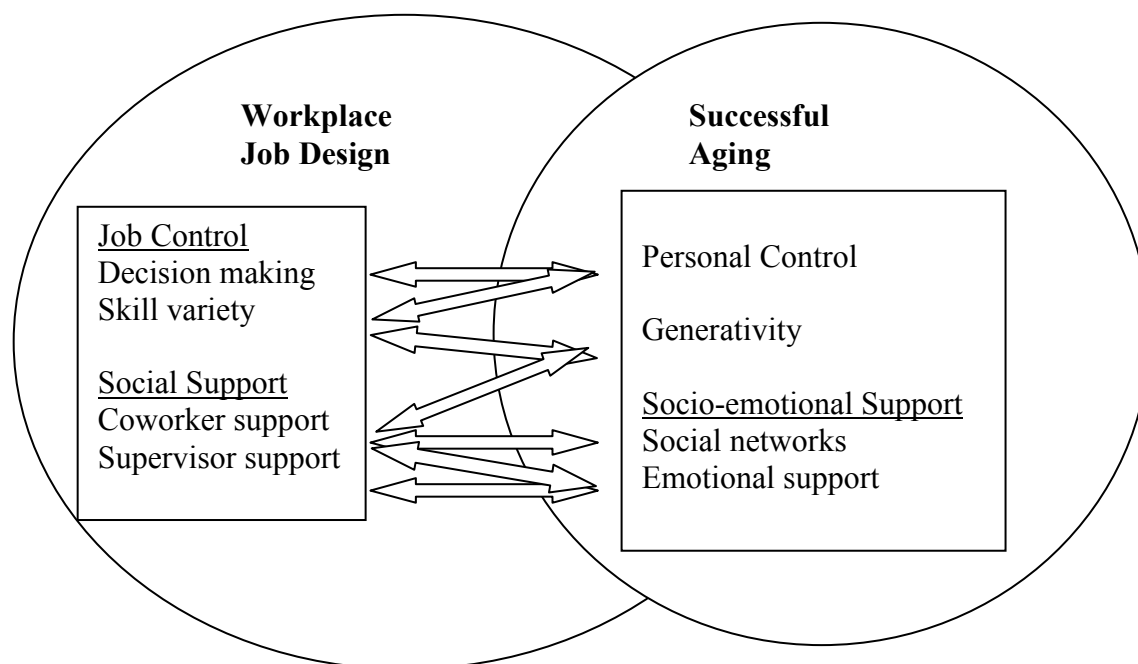


Figure 1. The proposed relationship of variables between workplace job design characteristics (Karasek & Theorell, 1990) and a theory of successful aging (Rowe & Kahn, 1997).

Rationale for the Study

The justification for examining workplace job design as a means to promote older workers' psychosocial needs can be addressed from economic, cultural, and individual worker perspectives. From a labor economy perspective, participation of older workers in the labor force is considered vital to U. S. and international markets (Brooke, 2003; Ilmarinen, 2006). As Baby Boomers retire the United States labor force may undergo a

labor shortage that would impact the economic dependency ratio, workforce productivity, and the transfer of knowledge to younger workers (DeLong, 2004; Desouza, 2003; General Accounting Office [GAO], 2001; Goldberg, 2000; Toosi, 2004).

From a cultural perspective, older workers have traditionally helped younger generations assimilate a strong work ethic and social values (Hareven, 2000). Although the concepts of mentoring and generativity in the workplace are being renegotiated in light of the sociotechnical changes in society (Erikson, 2003), values such as corporate loyalty, pride in craftsmanship, and patience continue to be demonstrated in older workers more so than younger workers (Smola & Sutton, 2002).

From an individual perspective, older adults recognize that financial incentives are not their primary motivations for working. According to the AARP (2003) at least 60% of all older workers over the age of 55 plan to continue working during retirement in order to remain productive, stay mentally and physically active, participate in something enjoyable, and socialize with others. These older adults may opt to retire if jobs are not perceived as fulfilling or positive experiences (AARP, 2003; Noonan, 2005).

The term age management has been coined to address accommodations for aging workers in contemporary industrial workplaces (Ilmarinen, 2006). The concept presumes that older workers' involvement in organizational decisions supports their personal growth and minimizes age-related physical and cognitive changes. However, current research indicates that workplaces are not consistently promoting older workers' training needs or including workers in decisions related to choices in job content (Armstrong-Slassen & Templer, 2004; BLS, 2001; Yeatts, Folts, & Knapp, 2000). These concepts

will be discussed in more detail in chapter 2 relative to the research on older workers, current training for older workers, and the need for understanding their work-related needs.

Problem Statement

Labor force economists predict a labor shortage within the next 10-15 years as the large Baby Boomer population begins to reach traditional retirement age in 2011 (Toosi, 2004). A labor shortage may influence the U. S. economy by impacting productivity and profitability, forcing industries to seek foreign means of production and limiting the resources required for research endeavors (DeLong, 2004; Desouza, 2003; GAO, 2001). In many industries, a shortage of skilled, experienced, and knowledgeable employees already exists, creating the demand for noncitizen employees to fill labor gaps in customer service, call centers, healthcare, and manufacturing jobs (DeLong, 2004; GAO, 2001). Industries such as these may benefit from retaining older workers or recruiting older workers to reenter the workforce (DeLong, 2004; Schaie & Schooler, 1998).

The speculated exit of older workers from the workforce is also posited to create a drain on highly skilled workers and corporate knowledge. Industry analysts acknowledge that in spite of the technological advances in industry, older workers maintain significant intellectual capital and knowledge of interdependent systems that have not been systematically captured and transferred to younger workers. As older workers retire, losses in intellectual capital may be difficult to recoup and may impact organizational performance (DeLong, 2004; Goldberg, 2000). Less acknowledged is the cultural value

of older workers modeling a positive work ethic for younger workers (McNaught & Barth, 1992; Smola & Sutton, 2002).

If businesses value the continued participation of older workers in the labor force, and if older adults seek positive work experiences that fulfill their psychosocial needs, then organizations need to understand how workplaces can be designed to optimize successful aging for older workers. The first step in designing an optimal work environment for older workers is to explore the workplace characteristics that predict successful aging outcomes for older workers.

Purpose of the Study

The purpose of this study was to identify characteristics of workplace job design that contribute to perceptions of successful aging in older workers employed as sales associates in the home building industry in Connecticut. The position of a sales associate was chosen for this study because at least 13% of all older workers are employed in this position nationally. This job emphasizes interaction with customers, the utilization of skills from past experiences, and the opportunity to pass along knowledge to younger workers, all of which are believed to contribute to successful aging (BLS, 2002; Erikson, 1997; Rowe & Kahn, 1998; Weiss & Bass, 2002).

Karasek and Theorell (1990) indicate jobs designed with opportunities to make decisions, use a variety of skills, and receive social support from coworkers and supervisors are associated with positive work experiences (Karasek & Theorell, 1990). This study was performed to determine if such job characteristics also influence the

perception of aging successfully (Erikson, 1997; McAdams & de St. Aubin, 1992; Rowe & Kahn, 1998).

Nature of the Study

Research Design

A cross-sectional survey design was used to study older workers' perceptions of their job characteristics and their perceptions of successful aging. Older sales associates in the home building industry were recruited through personal contact with workers in national home building retail organizations and managers of independent home building stores. Participants completed four standardized assessments that took about 10 to 15 minutes to complete. Data were analyzed using descriptive statistics, correlations, and multiple regression which is a multivariate statistical analysis that facilitates prediction of successful aging outcomes based on job design characteristics (Munroe, 2005). Chapter 3 presents more detailed information on the assumptions and procedures employed in multiple regression analysis.

Research Questions

The broad research question for this study was, How do job design characteristics (opportunities for decision-making, skill variety, coworker support, and supervisor support) influence successful aging outcomes (personal control, generativity, and social network, and emotional support) in older sales associates in the home building industry in Connecticut?

The following specific questions generated information that answered the broad research question.

1. What are the demographic characteristics of the sample of older workers in this study?
2. What are the mean levels of job design characteristics and successful aging variables in this study sample?
3. What is the relationship between job design variables and successful aging variables in older sales associates in the home building industry?
4. How much variance does each job design predictor variable (decision making, skill variety, coworker support, and supervisor support) contribute to each successful aging outcome variable (personal control, generativity, social network, and emotional support,) in older adult sales associates in the home building industry?
5. Which job design predictor variables are the most important in predicting successful aging outcomes?

Hypotheses

Null hypothesis. Psychosocial job design variables (decision making, skill variety, supervisor and coworker support) do not predict the variance in successful aging outcomes (personal control, generativity, social network, and emotional support) in older sales associates in the home building industry in Connecticut.

Alternative hypothesis. A weighted combination of job design variables (decision making, skill variety, supervisor, and coworker support) will predict successful aging

outcomes (personal control, generativity, social network, and emotional support) in older sales associates in the home building industry in Connecticut.

Definition of Terms and Variables

Older workers: adults aged 55 and older who were employed part- time (<30 hours per week) or full time (30 hours or greater) as sales associates in the home building industry.

Sales associate: a job position in which employees have the primary job responsibility of assisting customers at selecting the most appropriate items for their needs.

Home building industry: any national home building chain or local store that caters to building, repairing, decorating, or maintaining homes.

Workplace job design: the manner in which the job is organized to achieve the desired work product or service (Karasek & Theorell, 1990). According to the DCM the broad construct of job control (also called decision latitude) is operationalized to include opportunities to make decisions (called decision authority) and use a variety of skills (called skill discretion). The job design variables of decision making, skill use, coworker support, and supervisor support were measured using the following scales of the JCQ (JCQ) respectively: decision authority, skill discretion, coworker support, and supervisor support (Karasek, 1985).

Successful aging: high levels of physical, cognitive, and psychosocial functioning for older adults (Baltes & Baltes, 1990; Erikson, 1997; Rowe & Kahn, 1998). This study focused on one component of psychosocial functioning, active engagement with life

(Rowe & Kahn, 1998). Active engagement was measured through the following four variables: personal control, generativity, social network, and emotional support.

Personal control: the perception that individuals are responsible (generally) for events that occur to them and that they can control their life events (Eizenman et al., 1997; Ross & Wright, 1998; Wallhagen & Lacson, 1999). Personal control was measured through the Mirowsky-Ross 2X2 Index of Sense of Control (Mirowsky & Ross, 1991).

Generativity: opportunities for older adults to pass along wisdom to younger generations (Erikson, 1997; McAdams & de St. Aubin, 1992). Generativity was measured through two scales on the Loyola Generativity Scale: passing skills on to younger generations and being creative and productive (McAdams & de St. Aubin, 1992).

Social network: the number of close social contacts. Social networks were measured through the Social Network scale used in the MacArthur Studies of Successful Aging (Seeman, Lusignolo, Albert, & Berkman, 2001).

Emotional support: the degree of affection and respect that individuals experience from their social contacts. Emotional support was measured through the Emotional Support scales used in the MacArthur Studies of Successful Aging (Seeman, Lusignolo, Albert, & Berkman, 2001).

Assumption, Limitations, and Scope of the Study

The theoretical orientation of this study was sociological in the assumption that the social environment affects individual behavior and well being (Karasek, Brisson, Kawakami, Houtman, Bongers, & Amick, 1998). In this study the underlying assumption

was that the organization of work impacts workers' job experiences and self-perceptions. A further assumption was that work has the potential to provide positive opportunities for socialization, self-expression, physical activity, and daily structure (Quick & Tetrick, 2003). More specifically, it was assumed that the job position of a sales associate would allow older workers to interact with individuals, use of variety of skills, and utilize past experiences in their jobs.

One limitation that was anticipated related to older workers as a self-selected population of older adults who may be generally more positive, healthier, and well adjusted than the population of all older adults (Au et al., 2004; Haight & Belwal, 2006; Wegman & McGee, 2004). For such a group, the structure of the workplace may have had little influence on their overall perceptions of well being.

A further limitation was that this study used a convenience sample of older workers in one type of job position and industry. Thus, the results of this study can not be generalized to all older workers. The results pertain only to the workers in the home building industry and stores sampled.

The scope of the study narrowly focused on the specific psychosocial job design factors of decision making, skill variety, and social support. Numerous job design factors such as effort and rewards, perceived self-efficacy, career development, and productivity demands could influence older workers' job experiences; however these other variables were not be addressed in this study because they represent different theoretical approaches (Quick & Tetrick, 2003). Similarly, successful aging variables were limited to social support, personal control, and generativity. Other measures of successful aging

such as optimistic personality, adaptability, cognition, spirituality, and leisure activities were not addressed, although these too may impact perceptions of successful aging (Birren & Schaie, 2006; Bonder & Wagner, 2001; Neugarten, Havighurst, & Tobin, 1961).

Social Change Significance

The lifespan of adults is increasing, thus, older adults will spend more time in the later stages of older adulthood (Weiss & Bass, 2002). Whereas successful aging theorists suggest that successful adaptation to older adulthood is facilitated by intergenerational contact, participation in meaningful activity, socialization, and the ability to control personal life choices, the opportunities to enact such functions may be limited in contemporary society (Baltes & Baltes, 1990; Hareven, 2000; Rowe & Kahn, 1998).

Gerontologists speculate that, as a population, older adults' psychosocial needs are not being met through the current social systems (Erikson, 2003; Hareven, 2000; Lewis, 1996; Weiss & Bass, 2002). In fact, the social status once afforded to senior citizens has been devalued in our contemporary, technical society (Erikson, 2003). However, older adults' good health, cognitive status, and renewed interest in working may bring the workplace into the spotlight as a vehicle for social change that promotes respect for older adults' skills and wisdom and offers them the quality work experiences that will fulfill their needs for social and productive activities in later years (AARP, 2003).

This study provided information about optimal job designs that promote successful aging in older workers. Based on results of the study, recommendations were

developed to promote continued participation of older workers in the workforce. Recommendations include best practice guidelines for managing older workers, strategies to improve individual work experiences relative to aging successfully, suggestions for unique organizational roles for older workers, and justification for the development of intergenerational work teams. The outcomes of this study contribute to social change by providing the means through which the workplace become an institution that mutually serves the psychosocial needs of older adults and the productivity needs of businesses. Once older workers are welcomed into the workplace with jobs that are designed to highlight their skills then workplaces may contribute to the social change process of keeping older adults productively engaged and respected as vital members of our society.

Summary

Gerontologists, researchers, and policy analysts alike encourage social institutions such as the workplace to support the aging process for its constituents (AARP, 2003; GAO, 2001; Rowe & Kahn, 1998). Older adults and business corporations may benefit from the current trend of increased numbers of older workers in the labor force if jobs are designed to benefit older workers' psychosocial needs. This study began to identify the factors in the design of sales associate jobs in the home building industry that may contribute to successful aging in older workers. Chapter 1 provided the justification, theoretical perspectives for the study, and an overview of the research design.

Older workers are the fastest growing sector of the labor force and will be needed to fulfill labor gaps in the future (Toosi, 2004). Therefore, businesses may benefit from information about designing jobs to meet older adults' age-related needs. This study

examined the extent to which job design variables influence successful aging. Job design variables examined in the study included decision authority, skill variety, coworker support, and supervisor support. The variables that reflected successful aging outcomes included generativity, personal control, social networks, and emotional support. The theoretical frameworks of successful aging and the DCM of healthy work supported the key variables for the study.

Chapter 2, the literature review, provides a review of the construct of successful aging and an analysis of the research that supports the variables chosen for this study. Outcomes from the MacArthur studies are emphasized as they highlight key factors associated with successful aging. Job design characteristics associated with workplace health are examined in light of the impact of age-related changes on older workers' productivity. Chapter 3 describes sampling methods, the methods for data collection, data analysis, and the specific psychometric properties of the measurement tools selected for this study.

Chapter 4 presents the results of the study. Chapter 4 is organized according to the research questions: demographic information is presented, followed by the values associated with job design and successful aging variables, relationships among variables, and the ability of job design variables at predicting successful aging outcomes. In Chapter 5, the discussion, the results are summarized and broader assertions about health and job design for older workers are offered.

CHAPTER 2:

LITERATURE REVIEW

Literature Review Process

The lifespan in the United States has increased from age 47 in the early 1900s to about age 76 in 2002 (U. S. Census Bureau, 2002) thus extending the developmental period called older adulthood (Erikson, 1997) or the Third Age (Weiss & Bass, 2002). This change has prompted debate and investigation into the factors that promote successful aging and quality of life in later years. Although Rowe and Kahn (1998) suggested that paid work contributes to successful aging, few studies have directly examined the extent to which the design of older workers' jobs is associated with indicators of successful aging.

This literature review examined the current theories of successful aging and presented the research related to successful aging variables in this study. The review addressed workplace job design characteristics that are considered key to psychosocial health in the workplace and examined how job design characteristics and age-related changes in older workers reciprocally interact.

The literature review process was performed in four broad phases. The first phase identified the philosophical and theoretical foundations of successful aging and workplace job design from specialized textbook sources; the second phase utilized computer-generated data bases to retrieve research articles; the third phase examined bibliographies and other policy papers related to the chosen variables; the fourth phase analyzed the instruments, study designs, and methods related to the study.

The first phase of the literature review was performed by consulting gerontology and psychology of aging textbooks that review current theories on aging including genetic and nongenetic theories, psychological, psychosocial, and lifespan theories (Birren & Schaie, 2006; Bondar & Wagner, 2001; Lewis, 1996). Four theories emerged as relevant to this study on older workers: the theory of selection, optimization, and compensation (SOC) (Baltes & Baltes, 1990), the theory of successful aging promoted by Rowe and Kahn (1998), a theory of generativity (Erikson, 1997; McAdams & de St. Aubin, 1992; Weiss & Bass, 2002), and life satisfaction theory (Neugarten, Havighurst, & Tobin, 1961). These broad theories were reviewed for the ability to operationalize theoretical constructs for this study. The theory on life satisfaction was not used as a theoretical foundation for this study due to the lack of consistent concepts related to the construct of life satisfaction and the substantial variation in the ways it has been operationalized in the past.

A computer-generated literature review was then performed using the following health and science and business data bases: CINAHL, Pub Med, PsychArticles, and ABI Inform. The initial searches relied on the following keywords: successful aging, theories of successful aging, well-being in older adults, employment for older adults, age discrimination in older workers, and job modification and older workers. Each topic was searched using the following inclusion criterion: peer-reviewed, related to humans, written in English, and published within the last 5 years. The outcomes for each keyword search in Pub Med (PM) and CINAHL were as follows: successful aging (PM, 36; CINAHL, 221), theories of successful aging (PM, 1; CINAHL, 0) well-being and older

adults (PM, 35; CINAHL, 290), employment and older adults (PM, 32; CINAHL, 60), age discrimination and older adults (PM 8; CINAHL, 4), job modification (PM, 7; CINAHL, 7), and Demand-Control Model (PM, 21; CINAHL, 27). The ABI Inform database search did not reveal research-related articles, and thus, none were retrieved from this data base. The abstracts for all relevant articles were reviewed. If the article appeared to provide information about labor force trends for older adults, employment of older adults, age-related changes for older adults, or research related to the variables under study, then the articles were printed and read thoroughly. Articles were included in the literature review if they were peer-reviewed, research-oriented, and provided either a historical or current perspective on the specific study variables.

Subsequent searches were modified to obtain more specific information about the psychosocial variables related to this study. The keywords included MacArthur studies (PM, 65), perceived self-efficacy and aging (PM, 30), perceived personal control and older adults (PM, 16), productive aging and older adults (PM, 50), generativity (PM, 18), and adaptive aging (PM, 120).

The searches retrieved numerous articles as indicated, but fewer directly related to the specific topic and theories under study. Thus, the third phase reviewed summary articles (Depp & Jeste, 2006; Jopp & Smith, 2006) and retrieved publications cited in bibliographies that traced the research development of a particular theory, concept, or variable (Lang, Ricckman, & Baltes, 2002; Moyers & Coleman, 2004; Rowe & Kahn, 1997; Seeman, Lusignolo, Albert, & Berkman, 2001). For example, Rowe and Kahn

(1997) and Seeman et al. (2001) cited previous studies related to the longitudinal MacArthur studies that were not retrieved by data base searches.

The last phase focused on retrieving articles related to the instruments used to measure variables and survey design methodologies. The data bases PsycArticles (referred to as Psych) and Pub Med were accessed. Keywords and the related number of article search retrievals were: personal control scales (PM, 1; Psych, 0), JCQ (PM, 6: Psych 3), Loyola Generativity Scale (Psych, 3), survey design and seniors (PM, 6). These studies yielded information on the participant samples, instrument psychometrics, data analysis, and return rates for surveys sampling older adults. Thus, the following literature review reflects information gathered from multiple sources that were organized to reflect the major theories and variables under study. As stated, the literature review has been updated every three months since the original search.

Theories of Successful Aging

Attempts to define and measure the construct of successful aging have been ongoing since the 1960s. Gerontologists in the 1960s through 1980s equated successful aging with subjective well being and life satisfaction (Diener, 1984; Diener, Emmons, Larsen, & Griffin, 1985; Neugarten, Havighurst, & Tobain, 1961), suggesting that successful aging was based on one's internal standards of success. Biomedical definitions based successful aging criteria on quantity of life measures using increased longevity and lack of disease as indicators of successful aging (Fries, 1990). From such biomedical perspectives age-related declines in function were expected consequences of the normal aging process.

Since the late 1980s two broad psychosocial approaches to examining the construct of successful aging have emerged (Baltes & Baltes, 1990; Rowe & Kahn, 1987, 1997, 1998). A *normative or standards-based approach* equates successful aging with the theoretically defined developmental tasks of aging and maintenance of high functional levels in older adulthood. For example Erikson's (1997) theory of psychosocial role development bases successful aging on completing the normative developmental tasks of generativity and integrity in older adulthood. Rowe and Kahn (1998) base successful aging on maintaining good health, cognitive, physical, and psychosocial functioning in later years as indicated by high levels of functioning. This normative approach implies a standard of optimal aging based on prescribed psychosocial theories and institutional expectations. This approach further places a high premium on good physical and cognitive health as an indicator of successful aging.

A *lifespan approach* bases successful aging on older adults' abilities to adapt to age-related changes and attain self-identified goals. This approach suggests that individuals narrow their scope of activities in older adulthood and maximize involvement in personally meaningful activities using compensatory methods to enable function (Baltes & Baltes, 1990). The following discussion will further examine these theoretical perspectives in order to provide theoretical context for the study.

Rowe and Kahn's Theory of Successful Aging

Theoretical background. In 1987 Rowe and Kahn challenged the notion that aging was an inevitable decline in function. They acknowledged that environmental and

behavioral factors are equally as important as genetic predisposition in the aging process; they suggested that “successful agers” were distinct from “usual agers” due to their abilities to maintain good health and high levels of cognitive and physical functioning, which were associated with healthy lifestyles. These propositions were consistent with the evolving gerontological and biomedical perspectives that cognitive and physical declines in older adults are not homogenous across all individuals and that morbidity can be delayed and compressed into a shortened time period in later life (Au et al., 2004; Birren & Schaie, 2006; Bonder & Wagner, 2001).

In 1997, Rowe and Kahn modified the construct of successful aging to include active *engagement with life* as the third component. Active engagement refers to participation in interpersonal relationships and productive activities. *Interpersonal relationships* is conceptualized as socio-emotional support (expressions of affection, respect, and esteem for others) and instrumental support (giving and receiving assistance to others with daily living chores). *Productive activities* include activities that create societal value such as paid work, volunteer work, caring for others, or housework. Rowe and Kahn (1998) encouraged all social institutions to identify factors that could improve the aging process for its consumers.

The MacArthur Field Studies of successful aging. The MacArthur Foundation commissioned Rowe and Kahn to conduct the MacArthur Field Studies of Successful Aging in order to identify the factors that contributed to resilience and high levels of functioning later in life. High levels of functioning referred to high physiologic, cognitive, physical, and psychosocial capacities in older adults (Rowe & Kahn, 1998).

Researchers sampled 1,192 older adults aged 70-79 years from the National Institute of Aging (NIA) Established Populations for Epidemiologic Studies of the Elderly (EPESE) who had scored in the top 30% of cognitive and physical functioning from previous NIA studies. Participants completed a battery of physical health, cognitive health, and social and psychological functioning in 1988, 1991, and then again in 1996 (Seeman, Lusignolo, Albert, & Berkman, 2001).

The MacArthur studies evaluated the contribution and inter-relationships of such variables as self efficacy (Seeman, Rodin, & Albert, 1993; Seeman, McAvay, Merrill, Albert, & Rodin, 1996), social support (Seeman, Lusignolo, Albert, & Berkman, 2001), functional ability (Seeman, Unger, McAvay, & Mendes de Leon, 1999), and physical functioning (Seeman, et al., 1999) as related to successful aging outcome measures: physiologic functioning, cognitive status, physical capabilities, and active engagement with life.

Results of the MacArthur studies found that high cognitive functioning was related to education, strenuous activity, good lung functioning, high self-efficacy, and social support (Seeman et al., 2001). Physical capacities were maintained by minimizing risk factors for disease (such as weight gain and high blood pressure) and maximizing lifestyle behavioral factors such as activity, socio-emotional support (Seeman et al., 1996), and high self-efficacy beliefs (Seeman et al., 1999). Continuing engagement with life was related to emotionally supportive relationships, education, functional capacity, self-efficacy, and personal control (Eizenman, Nesselrode, Featherman, & Rowe, 1998; Seeman, Unger, McAvay, & Mendes de Leon, 1999).

The MacArthur studies demonstrated that high socio-emotional support and personal control over one's environment are consistently related to indicators of successful aging (active engagement in life, high cognitive, and high physical functioning). Thus, the ability to provide older adults with continued opportunities for social support and personal control would appear important to their quality of life.

Rowe and Kahn (1998) indicated that paid work contributes to successful aging in older adults. However, workplace opportunities to engage in social support and personal control have not been directly related to these measures of successful aging. This study therefore explored workplace psychosocial job characteristics as contributors to the successful aging process.

Another aspect of aging, generativity, has been associated with a positive adjustment to later life (Erikson, 1997). The workplace has been traditionally associated with opportunities for generative experiences with younger coworkers through teaching and mentoring experiences (Hareven, 2000). Thus, generativity, as an additional measure of successful aging, will next be examined next (Erikson, 1997; Weiss & Bass, 2002).

Erikson's Theory of Psychosocial Development: Older Adulthood

Erikson (1950, 1997) advanced the understanding of the normative stages of psychosocial role development in older adults. Erikson explained that in older adulthood, the qualities of hope, fidelity, and caring for others emerge from prior life stages as psychosocial strengths that contribute to the generational cycle. The psychosocial stage associated with older adulthood, integrity versus despair, represents a struggle between

embodying the wisdom associated with life experience and the hopelessness that may be associated with future losses. Erikson suggested that integrity represents a sense of unity with the past and the ability to understand present human issues.

Erikson's (1950, 1997) concept of generativity is being recognized as key to advancing integrity in older adulthood (de St. Aubin, McAdams & Kim, 2003; McAdams & de St. Aubin, 1992). Generativity is the means through which older adults express their concern, caring, and commitment to the next generation. Older adults nurture, teach, and support younger generations while creating positive social values and outcomes that fit the social system and promote its continuity from one generation to the next (Erikson, 1950; McAdams & de St. Aubin, 1992). Thus, generativity has implications for fulfilling not only individual psychological needs but also the needs of society as a whole.

However, generativity may be harder to enact for this generation of older adults given looser family relationships, fewer apprenticeship models of workplace training, and potentially fewer opportunities for intergenerational contact (Erikson, 2003; Hareven, 2000). Further, generativity is transactional in that cultural forces shape both how older adults orient themselves to the next generation and how the younger generations receive the wisdom of older adults (de St. Aubin, McAdams & Kim, 2003; Erikson, 2003). In fact, de St. Aubin, McAdams, and Kim describe a "generativity crisis" in which the traditional methods and messages that once guided younger generations may be increasingly devalued due to rapid sociotechnical changes in the workplace and the perception that older adults' wisdom is not applicable in contemporary society. Thus, the

entire process of generativity may be in transition, taking on newer forms, messages, and variations in meaning than once described.

Whereas generativity was initially thought to be the domain of parenthood, Erikson and others acknowledge that generative experiences may evolve through friendships, community activism, leisure activities, care giving, and workplace relationships (Erikson, 1950; McAdams & de St. Aubin, 1992; Peterson, 2002; Peterson & Klohnen, 1995). Although it is generally accepted that the workplace can spawn generative experiences through mentoring younger workers (Smola & Sutton, 2002), few studies have explored workplace mentoring within the context of generativity (McAdams & de St. Aubin, 1992; Peterson & Klohnen, 1995). Among those that have addressed generativity through workplace mentoring, Peterson and Klohnen found that highly educated women in their 40s who scored high on generativity scales valued the opportunity for generative actions in the workplace. Altschuler (2004), in a phenomenological study of the meaning of work for older women, found that women in their mid 60s were compelled to instill the importance of earning a living into young female coworkers. This study examined the issue of generativity as related to older workers' perceptions of opportunities for generative experiences in the workplace.

Both Rowe and Kahn (1998) and Erikson (1997) based successful aging indicators on theoretical and functional norms as measured by an outside reference (such as a theory or a functional ideal). Baltes and Baltes (1990) suggested an alternative, lifespan approach that conceptualizes successful aging as an internalized adaptive process.

Baltes' and Baltes' Adaptive Competence Model of Successful Aging

Baltes and Baltes (1990) proposed a lifespan approach to successful aging proposing that older adults adapt to the aging process by balancing personal growth and decline in later years. Baltes and Baltes developed the model of selection, optimization and compensation (SOC) in which older adults select meaningful life activities, optimize their capacities for performing these activities, and learn how to compensate for tasks they cannot perform. Older adults select activities in which they can successfully engage, based on the resources available, personal goals, skills, and competence (Jopp & Smith, 2006). They compensate for losses by utilizing cues, adaptive equipment, or environmental modifications that allow them to continue engagement at high levels of functioning (Baltes & Baltes, 1990; Lang, Ricckman & Baltes, 2002).

This high-efficacy involvement in a narrow range of activities is believed to provide personal control and life satisfaction (Baltes & Baltes, 1990). However, deficits in resources such as personal control and social networks may hinder both use of SOC and the overall perception of successful aging (Jopp & Smith, 2006). Therefore, from the SOC perspective, social support and personal control are also viewed as resources that enable older adults' adaptive competence in their desired activities.

Both normative (Erikson, 1997; Rowe & Kahn, 1998) and adaptive (Baltes and Baltes, 1990) theories of successful aging reflect a life process in which older adults strive to stay healthy, in control of their environment, socially connected, engaged in meaningful activity, and instrumental at teaching younger generations. Whereas Rowe and Kahn base successful aging on the criteria of good health, high cognitive and

physical functioning, and active engagement in life, the model of SOC specifies these elements as resources that contribute to an individually defined definition of successful aging (Baltes & Baltes, 1990; Rowe & Kahn, 1998). However, the two models represent complementary rather than conflicting viewpoints of successful aging given the close relationship between adaptation to the aging process and use of personal resources (Lang, Ricckman & Baltes, 2002; Jopp & Smith, 2006). Collectively, these approaches to successful aging promote the importance of personal control, social support, and generativity in supporting successful aging. Given the broad nature of these variables each variable will be specifically discussed relative to operational definitions for this study.

Selected Variables Related to Successful Aging

Personal Control and Successful Aging

Personal control defined. Personal control and self-efficacy are considered fundamental to human existence, emotional well being, life satisfaction, and successful aging (Baltes & Baltes, 1990; Bandura, 1997; Brandtstadter & Rothermun, 1994; Kunzman, Little, & Smith, 2002; Rowe & Kahn, 1998). High levels of personal control and self efficacy enable older adults to use positive coping strategies (Brandtstadter & Rothermun, 1994), maintain high levels of cognitive and physical functioning (Seeman et al., 1993; Seeman et al., 1996), and deal effectively with caregiving (Wallhagen & Kagan, 1993) and chronic illness (Wallhagen & Lacson, 1999). Perceived self efficacy is defined as beliefs in the ability to organize and execute actions to produce a desired outcome (Bandura, 1997). Self-efficacy beliefs influence the types of activities in which

individuals engage and the effort put forth at achieving the desired outcome (Bandura, 1997; Seeman et al., 1996).

Personal control is a closely related but distinct concept (although sometimes used interchangeably with self-efficacy). Personal control reflects a sense of control over the environment or situation and the belief that a person is responsible for the events that occur in a person's life, whether good or bad (Kunzmann, Little, & Smith, 2002; Mirowsky & Ross, 1991; Ross & Wright, 1998; Wallhagen & Lacson, 1999). Most discussions of personal control focus more so on locus of control concepts (beliefs that outcomes are dependent upon a person rather than fate or other people) rather than expectancy beliefs (beliefs that a person has the ability to perform the actions necessary for desired outcomes). Personal control is affected by age, socio-economic status, social situations that impact individual autonomy, and the ability to acquire the resources necessary for desired outcomes (Mirowsky & Ross, 1991; Pitcher & Hong, 1986). Personal control is considered to be more situational and variable than self-efficacy and thus, may be more sensitive to variations in work environments and employment status than self-efficacy (Ross & Wright, 1998). Therefore, the construct of personal control as related to successful aging was used for this study.

Personal control was originally believed to decrease throughout the aging process due to older adults' lack of control over age-related changes (Baltes & Baltes, 1990; Mirowsky & Ross, 1991; Pitcher & Hong, 1986). Mirowsky and Ross found a consistent decrease in levels of personal control according to age in a sample of 780 community adults. However, current research suggests that personal control is a strong predictor of

well-being in older adults (Brandtstadter & Rothermund, 1994; Kunzan et al, 2002; Pitcher & Hong, 1986). Eizenman et al. (1997) found that variability in personal control predicted longevity in older adults in the MacArthur studies. Brandtstadter and Rothermund found that healthy older adults re-prioritize life domains and strive to maintain control over domains that are important to them. Kunzan et al. found that in old to very old adults personal control over desired outcomes is an adaptive strategy used to mitigate the lack of control over undesired outcomes such as failing health or medical issues. Thus, the perception of control over the environment (and situations) appears central to emotional and physical well being in older adults.

Personal control and the workplace. Bandura (1997) suggested that perceived self-efficacy and personal control promote occupational advancement in the workplace by enabling the mastery of new skills. However, for older workers, fewer opportunities may exist for retraining or career advancement; thus, Bandura suggested that older employees may plateau or stagnate in jobs that lack variety, challenge, and opportunities to expand their competencies (Bandura, 1997; Moyers & Coleman, 2004). Older workers may experience a decreased sense of control over the work environment if their skills become obsolete and if they are not trained for new work roles. Thus, the present design of traditional workplaces may not support continued personal control or autonomy for older workers (Bandura, 1997; Moyers & Coleman, 2004).

Measurements of personal control. Personal control has been measured according to general life perspectives, individual life domains, and population or environment-specific content. Kunzmann, Little, and Smith (2002) developed a

generalized measure of personal control for older adults aged 70 - 103 that assesses perceptions of personal control over desirable outcomes, responsibility for undesirable outcomes, and others' control of one's life. Brandtstadter and Rothermund (1994) assessed both generalized and domain-specific perceptions of personal control in order to understand older adults' well-being and adjustment to age-related losses.

Eizenman et al. (1997) selected items from the Pearlin Seven-Item Mastery Scale (Pearlin & Schooler, 1978) to measure the variations in levels of perceived personal control in older adults in the MacArthur studies over a 2 ½ year period of time.

Strawbridge, Wallhagen, and Cohen (2002) used the Wallhagen Perceived Control Questionnaire (PCQ-R) to assess the extent to which older adults perceive that a chronic health condition is controlled by individuals or factors out of their control (Wallhagen & Lacson, 1999).

Although these personal control assessments are valid measures of locus of control as related to a particular context, additional personality constructs such as cynicism and negative affectivity are interwoven into some scales, thus confounding the construct of personal control (Brandtstadter & Rothermund, 1994; Wallhagen & Lacson, 1999). Further, in other scales, such as the Pearlin Mastery scales, the questions are imbalanced and negatively biased toward either denying personal control (claiming less control over bad outcomes, called a defense bias) or biased toward agreeing with positive responses (claiming strong control over good outcomes, agreement bias). Thus, the personal control measures mentioned may not represent a balanced or accurate

assessment of the construct of personal control relative to this study (Mirowsky & Ross, 1991).

The Mirowsky and Ross 2 X 2 Index of Sense of Control (1991), the scale chosen for this study, is a generalized measure of the locus of control dimension of personal control. The scale balances the number of questions relating to (a) claiming and denying control over the environment and (b) perceiving control over good and bad outcomes, thereby eliminating defense and agreement bias from the measurement of personal control. This scale has been used to study generalized perceptions of personal control as related to employment status, job design, and gender differences in personal control (Bird & Ross, 1993; Ross & Wright, 1998).

Research studies for personal sense of control. The Mirowsky-Ross 2 X 2 Index of Sense of Control scale measured perceived control relative to individuals claiming control and denying responsibility for good and bad outcomes in life situations. The scale has been extensively used to examine the relationship between personal sense of control and healthy lifestyle behaviors (Mirowsky & Ross, 1998), subjective life expectancy (Ross & Mirowsky, 2002), personal stress (Wolinsky, Wyrwich, Kroenke, Babu, & Tierney, 2003a), and longitudinal changes in personal sense of control with age (Wolinsky, Wyrwich, Kroenke, Babu, & Tierney, 2003b).

Other studies using the Mirowsky-Ross scale have recoded or transformed the original scale to match other scales used in the particular study; thus, it is difficult to compare the scores among studies. Mirowsky and Ross (1998) used a 5- point scale from -2 to 2, where -2 indicated the least control and 2 indicated the most control; 0 indicated

no response, or “don’t know”. Using this scale, Mirowsky and Ross (1998) sampled 713 community-dwelling older adults and found a mean score of .673 which represented 1.93 *SD* above the value of 0 (which was valued as neither internally or externally controlled).

Mirowsky and Ross (1998) and Wolinsky et al. (2003b) used this 5-point scale (that was transformed to a 100 point scale for Wolinsky et al.,) and found a consistent decline in sense of control scores after the age of 50 for well populations and for those with chronic illnesses. In well populations, Mirowsky and Ross compared the personal sense of control scores among younger and older men and equivalent groups of women. Researchers found that mean scores for each question decreased with age (younger men = .75; older men = .65) and that the mean scores were higher for older men (men = .65) than for older women (M = .47). In older men with chronic heart disease, Wolinsky et al. found a gradual decrease of personal sense of control with age in both cross-sectional and longitudinal studies (using a transformed squared and cubed values respectively). Thus, the scale seems sensitive enough to measure variation within a group of workers.

The next variable presented is social support.

Social Support and Successful Aging

Social support defined. The importance of social support and the value of a social network have been a focus in successful aging literature relative to the protective effects of social support on older adults’ health. Social support has been related to enhancing well-being, facilitating adjustment to retirement and widowhood, and maintaining

independence in older adulthood (Berkman, Seeman, Albert, Blazer, Kahn, Mohs, et al., 1993; Rowe & Kahn, 1998).

Social support has been defined in terms of the resources that facilitate social functioning (Lang, Ricckman, & Baltes, 2002); the number of social ties, called social network (Berkman et al., 1993; Seeman et al., 2001); affection from others, called socio-emotional support (Rodin & McAvay, 1992); and, assistance with daily living chores, called instrumental support (Seeman et al., 2001). Lang, Fetherman, and Nesselrode (1997) suggested that social relationships are selected not only for emotional benefits, but also for predictability, perceived availability, and stability of social relationships. When the availability of social relationships is unpredictable, older adults do not perceive control over their social environment (Lang et al, 1997). Baltes and Baltes (1990) noted that social networks for older adults often diminish in later years due to depression, fatigue, chronic illnesses, and unpredictability of social supports. Social support is consistently related to measures of successful aging including cognitive, physical, psychosocial functioning (Depp & Jeste, 2006; Rowe & Kahn, 1998; Seeman et al., 2001; Strawbridge, Wallhagen, & Cohen, 2002) and adaptive capacities in older age (Baltes & Baltes, 1990).

While the literature previous to the mid 1980s measured social support indirectly through simply identifying the quantity of social contacts, Seeman and Berkman (1988) acknowledged that the quality of social contacts may also be important to understanding the total contribution of social contacts to health. Seeman and Berkman developed a social networking scale for the Yale Health and Aging Project, a study of the

psychosocial dimensions of health in 1,172 seniors ages 70 -77 years old. The project was designed to assess both the quantity of social contacts (the number of contacts with children, friends, and participation in social groups) and the quality of these social interactions for older adults 65 and older. Seeman and Berkman found that the number of social supports (also called network size) was associated with the perception of adequacy of emotional support. The study also found that face to face contact was the strongest measure of support, the presence of a spouse was not related to support adequacy, and contacts with friends and family were more strongly predictive of perceived adequacy of social supports than contacts with children. These results demonstrated that the dimensions of social networks (quantity and quality) are complex and distinct enough to warrant two different scales.

The concepts of social networking and socio-emotional support appear to be the most salient for this study given older adults' potential to expand the number and type of social ties through paid employment. The social support criteria for successful aging has been defined as visiting friends or family at least one day a week (Montross, Depp, Daly, Reichstadt, Golshan, et al., 2000) or monthly (Strawbridge et al., 2002) *and* having three or more close friends (Montross, et al., 2000; Strawbridge).

Measurement of social support. The construct of social support as related to successful aging has been operationalized in various manners. Most studies measure social support through the number of self-reported social ties, the quality of the relationships, and the frequency of contact with close friends, family, or others (Montross et al., 2000; Strawbridge et al., 2006;). Rodin and McAvay (1992) assessed the

availability of emotional support and the variety of sources of emotional support. Seeman et al. (2001) combined content of the aforementioned studies and expanded the concept of social networks to include the number and type of community relationships and participation in groups. This study operationalized social support as the social network (number of close ties with family, friends, spouse, and community groups) and emotional support (affection and esteem experienced from individuals in the social network) as modeled after the MacArthur studies (Seeman et al., 2001). The last successful aging variable, generativity, is defined in terms of conceptual and operational definitions.

Generativity and Successful Aging

Generativity defined. The construct of generativity was introduced as a psychosocial developmental task by Erikson (1950, 1997) and expanded by McAdams and de St. Aubin (1992) as a means to link the individual with society. McAdams and de St. Aubin proposed a model of generativity which features an individual's desire to leave a life legacy and a broader cultural demand for taking responsibility for the next generation. The model suggests that when individuals believe in the goodness of human beings they commit themselves to becoming involved in the lives of younger generations and develop a plan for creating, maintaining, or providing teaching experiences to younger individuals.

Lifespan studies that have addressed generative concerns among adults ages 19 - 70 have found that generativity is positively associated with age and having children,

especially among fathers (McAdams & de St. Aubin, 1992), and opportunities for mentorship experiences (Peterson, 2002).

Measures of generativity. McAdams and de St. Aubin (1992) developed assessments to measure three components of generativity: generative concerns, generative goals, and generative actions. The Loyola Generativity Scale (LGS) was developed to address the strength of a person's concern for the next generation. The survey addresses the following concerns related to generativity: the desire to pass skills on to younger generations, contribute to the welfare of a person's community, leave a lasting personal legacy, be creative and productive, and care for other people. Generative goals are measured through examining a person's most important daily strivings. Generative acts are measured through identifying the frequency of performing creative or giving actions. A narrative component of the assessment encourages participants to provide 5 stories that indicate a recent peak experience, a low experience, and an experience of commitment, a goal, or an imagined future experience. This study addressed two generative concerns using the Loyola Generativity Scale: desire to pass skills on to younger generations, and being creative and productive. The next section addresses job design theory and how it may impact older workers.

Job Design Theory and Application to Older Workers

Job design impacts the psychosocial health of all workers (Ackoff, 1978; Karasek & Theorell, 1990). However, age-related changes may further impact older workers' job performance and psychosocial health. This review briefly addressed the concept of job design, the impact of age-related changes on work performance, and the potential for the

psychosocial characteristics of the workplace to contribute to successful aging in older workers. The job of a sales associate is explored as a position that may exemplify a job design characteristics that contribute to successful aging in older workers.

Psychosocial Features of Job Design

Historical perspective on job design. Job design refers to the way a job is organized to maximize individual performance and productivity for an organization (Karasek & Theorell, 1990; Parker, Wall & Cordery, 2001). Early Tayloristic approaches to job design during the Industrial Revolution focused on simplifying job tasks in order to maximize worker efficiency. Companies centralized authority and controlled employees' job tasks in order to maximize productivity for the organization (Ackoff, 1978; Parker, Wall & Cordery, 2001). Although worker output increased, these repetitive jobs were found to be boring, isolating, dehumanizing, and potentially damaging to mental health (Ackoff; Karasek & Theorell; Kohn & Schooler, 1982). The concept of worker alienation emerged, which referred to having little control over one's job, little fulfillment in work, and few social connections to other workers (Kohn & Schooler).

The next era of job design focused on enriching jobs in order to promote personal development in workers (Hackman & Oldham, 1976; Parker et al., 2001). Hackman and Oldham developed the job characteristics model (JCM) which proposed that well-designed jobs should include skill variety, task identity, task significance, autonomy, and feedback, in order to ensure job satisfaction for workers. Karasek (1979) developed the DCM, which proposed that four job characteristics are critical to worker psychological

health: autonomy, skill variety, decision-making, and social support. According to the model, psychological strain results from the interactive effects of highly demanding jobs and few opportunities for skill variety, autonomy, and social support. Psychological strain manifests in fatigue, anxiety, and depression and is predictive of worker dissatisfaction (Rafinsdottir & Gudmundsdottir, 2000), cardiovascular disease (Karasek & Theorell, 1996; Riese, Van Doormen, Houtman, & Geus, 2000), and musculoskeletal disorders (Warren et al., 2000).

Despite the economic shift to a service economy in the 20th century the psychologically limiting nature of Industrial Era jobs have been transferred to many contemporary office, service, call-center, and data-entry jobs (Hockertin & Harenstam, 2006; Parker et al., 2001). Many corporations continue to limit worker control and decision-making through the use of routine work, monotonous tasks, and computer based technology (Desouza, 2003; Karasek & Theorell, 1990; Rafinsdottir & Gudmundsdottir, 2000). Macro level issues related to the type of workplace ownership (public sector, private sector, or cooperatives, for example) has also been found to impact workers' psychosocial experiences and perceptions of control over one's job (Hockertin & Harenstam, 2006).

Hockertim and Harenstam (2006) measured the psychosocial job characteristics in 60 service-related companies in Sweden and found that those working in public enterprises (publicly owned profit-making companies) and labor-intensive industries estimated their workplace control to be lower than those working in the private sector and in knowledge-intensive jobs. Of the job design characteristics measured, control over

one's job had the highest organizational-level variance among workplaces followed by job demands and workplace climate. This study suggested that individual job design characteristics also vary according to organizational-level structures. These job design characteristics can be measured and related to considerations for worker health.

Job design and effects on generalized personal control. The DCM identifies the relationship between job design and worker health (physical and psychosocial). However, the question remains as to whether job design also impacts one's perception of personal control over life. Ross and Wright (1998) examined the construct of personal control as related to work alienation in a telephone survey of 2,592 employed respondents. Researchers found that work autonomy, decision-making, freedom from supervision, fulfilling work, and non-isolated work all significantly contributed to one's generalized sense of personal life control as measured by the Mirowsky and Ross 2X2 Index of Sense of Control (Mirowsky & Ross, 1991). Women demonstrated a lower sense of personal control than men, possibly due to the more routine, less autonomous nature of their jobs; those who worked part-time expressed less personal control than those who worked full time. This outcome suggests that autonomy in the workplace may also contribute to perceptions of personal control over life for older workers.

Impact of Job Design on Older Workers

A healthy job design is important for all workers but may be particularly salient for older workers who may be at risk for comorbidities when psychosocial strains are superimposed on chronic health conditions. Older workers' traditional socialization to

work and age-related physical and cognitive changes may further impact their job experiences and perceptions of control over work (Moyers & Coleman, 2004; Wegman & McGee, 2004)

Age-related changes and work performance. Older workers are a heterogeneous population who manifest age-related changes differently. The majority of older adults, however, undergo some degree of cognitive, musculoskeletal, and cardiovascular change over time. The most commonly acknowledged changes include decreased cardiovascular endurance, decreased muscle strength and mobility, decreased balance reactions, slower cognitive processing, and decreased working memory, among others (Bonder & Wagner, 2001; Hogan, 2005; Mazzeo, Cavanagh, Evans, Fiatarone, Hagberg, et al., 1998).

The extent to which age-related changes impact job tasks depends on the type of job. Older workers whose jobs entail precision work, paced manual assembly, or heavy physical labor may be less productive and at higher risk for occupational injuries than younger workers (Kawakami, Inoue, Ohkubo, & Ueno, 2000; Kemmlert & Lundhom, 2005). However, jobs that entail primarily cognitive processes and interpersonal skills may be minimally affected by age-related changes especially if jobs can be modified to accommodate deficits (Abraham & Hansson, 1995). When older workers' strengths, such as interpersonal skills, are highlighted older workers are equally, if not more productive, than younger workers despite additional technology training costs (Baltes & Baltes, 1990; Brooke, 2003; McNaught & Barth, 1992).

Sociotechnical context of work and older workers. Sociotechnical changes in the workplace may also impact older workers due to their lack of socialization to current

technology (Morris & Venkatesh, 2000; Smola & Sutton, 2002). Czaja and Sharit (1998) suggested that older adults may be threatened by technology demands and thus circumvent recruiting and retraining efforts. Other research suggests that business' lack of retraining for older employees leaves older workers with limited technological skills for continued employment and thus, at a disadvantage in performing technology dependent jobs (Armstrong-Stassen & Templer, 2004; BLS, 2001). In either circumstance, many older workers are less experienced with the technology than younger workers and may perceive less personal control over technology dependent tasks (Desouza, 2003; Moyers & Coleman, 2004). Thus, the extent to which older adults experience personal control over their jobs may relate to type of job, training, and prior experience in the field.

Justification for Sampling Sales Associates in the Home Building Industry

Trends in jobs for older workers. Presently, about 30% of all older workers (aged 55 and older) are employed in the workforce, a number that is expected to increase to about 37% by the year 2015 (GAO, 2001). Much of the increased labor force participation of older workers is driven by higher participation rates of women. Forty-two percent of all older women participated in the 1980s as compared to 52% who are participating in the 2000s. As workers age, the BLS (2006) indicates that their job choices shift from physically demanding occupations (such as a machinist) toward white collar and service occupations (such as sales associates). Thus, a higher proportion of older workers are employed in white collar and professional jobs than younger workers.

For example, in a comparison of the employment distribution of occupational groupings by age, in the year 2000, 15.5% of all 30-39 year olds were employed in executive and managerial jobs, whereas 17.2% of all 55-64 year olds were employed in managerial jobs (GAO, 2001). Concomitantly, fewer older workers were employed in blue collar jobs than younger workers (23.2% versus 29.1% respectively).

Sales jobs for older workers. The fact that a higher percentage of older workers than younger workers are employed in managerial jobs is not surprising given the natural career trajectory of individuals. However, when the proportions of older and younger workers employed in a white collar job (such as sales) are compared, the differences are significant. The GAO (2001) reported that in the year 2000, 12.8% of all 30-39 year olds were employed in sales jobs as compared to 15.5% of all workers aged 65-74. Further, when the category of older workers was examined according to 55-64 year olds and 65-74 years olds, the GAO report found that in 1990, 12.4% of all workers aged 55-64 worked in sales; whereas in 2000, 10 years later, 15.5 percent of this cohort (now aged 65 - 74) were now in sales, an increase of 25%. Thus, the job category of sales seems to be a realistic job option for both categories of older workers (55-64 and 65-74), and thus important to study. The GAO forecasted that the percentage of older workers employed in sales would increase to 18% in 2008.

These labor force participation demographics suggest that the occupational category of sales will be a growing option for older adults interested in full time, part-time, or seasonal work (GAO, 2001). More specifically, in the retail home building industry the percentage of sales associates is expected to increase from 13% in 2005 to

16.1% by 2008. This type of job is considered to be ideal for older adults due to their strong social skills and patience with the general public (McNaught & Barth, 1992).

Job description of sales' associates jobs. The job descriptions of sales associates (the target job for this study) focus on the interactive skills needed to understand and address customers' needs. For example, the job description from Home Depot emphasizes excellent customer service skills, good interpersonal communication, thorough product knowledge, and the ability to handle stressful situations effectively (U. S. Department of Labor, 2005). In fact, the job description at Home Depot specifically described the process of forming a relationship with the customer by asking open-ended questions, expressing an interest in customers' projects (in order to put the customer at ease), determining their level of expertise, and finally determining customers' needs (Home Depot, 2007).

Since increasing numbers of older workers are working in sales jobs across all industries (including retail drug stores, insurance, and home building industry), some companies are beginning to offer older workers flexible, part-time, or seasonal work (AARP, 2005). This study was initiated in order to understand the types of job organization and job positions that serve the needs of both older workers and businesses (GAO, 2001).

Age Management in the Workplace

Concept of age management. Ilmarinen (2006) coined the term "age management" to refer to managing workers according to their generational strengths. The

concerns for managing older workers have been raised internationally as industrialized countries seek to maintain productive labor forces in light of the demographic shift in the workforce toward older workers (Armstrong-Stassen & Templer; 2004; Brooke, 2003; Ilmarinen; Kawakami et al., 2000; Toosi, 2004). Age management has focused on promoting the workforce retention of older workers using such strategies as workplace training for supervisors in age-related issues, modifying jobs for older workers, and changing cultural attitudes about older workers. The goal of age management in the European Union (EU) is to increase the employment rate of older workers to 50% by 2010 in the EU15 countries (Ilmarinen).

Models of older worker adaptation to contemporary workplaces have been developed to guide program development and research related to older worker adaptation to contemporary workplaces (Moyers & Coleman, 2004; Yeatts et al., 2000). Yeatts et al. emphasized the importance of a “fit” between the knowledge, skills, and ability requirements of the work environment and the older worker. Moyers and Coleman discussed the adaptive capacities of workers to meet job demands. Abraham and Hansson (1995) applied SOC to age-related deficits in work performance. These models have continued to emphasize the importance of work environment flexibility and collaborative approaches between older workers and management.

Job design strategies for older workers. Job design strategies to support older workers need to include both macro-level (government and policy) and micro-level approaches (support at the job task level) (Fisk, Rogers, Charness, Czaja, & Sharit, 2004; Ilmarinen, 2006). Current strategies for supporting older workers include changes in the

organization of work (Wahlstedt et al., 2000), job training (Fisk et al., 2004; McNaught & Barth, 1992), job modification (Abraham & Hansson, 1995; Moyers & Coleman, 2004), and health promotion programs (Kawakami et al., 2000).

Work organizational strategies, the focus of this research, has addressed both the job content and authority structures that govern older workers' jobs. Schooler, Mulatu, and Oates (1999) advocated for providing skilled work experiences for older workers. These researchers found that performing cognitively complex work increased the intellectual functioning of older workers in the National Longitudinal Survey even late in their careers. McNaught and Barth (1995) promoted use of older workers' strong interpersonal skills for customer service-related jobs. Wahlstedt, Nygard, Kemmlert, Torgen, & Bjorksten (2000) demonstrated that older workers benefit from the autonomy and social support of a team-oriented organizational structure. Moyers and Coleman (2004) suggested that older workers be given opportunities for physical activity, responsibility, mentoring, and creative programming in order to promote emotional and physical health through work.

In summary, older workers, similar to younger workers, benefit from a workplace design that supports psychological growth. However, older workers may also benefit from additional supports that promote their need for continued skill development, personal control, social support, and abilities to impact younger generations. Yeatts et al. (2000) suggested that employers can enhance older workers' adaptation to the job by providing training in the skills needed for contemporary workplaces and by involving older workers in the process of redesigning their jobs. Yeatts et al. challenged employers

to design jobs that cognitively stimulate older workers and provide socialization that contributes to psychosocial support. Older workers have been challenged to recognize the benefits of continued employment and communicate age-related changes that compromise their work capacity and perception of control (Moyers & Coleman, 2004; Yeatts et al.).

Measurement of Job Design Characteristics

The JCQ is an internationally standardized psychosocial job assessment that measures psychosocial job design characteristics and predicts job strain (Karasek, et al., 1998). The JCQ is based on Karasek's DCM of occupational stress that predicts adverse health effects when job demands are high and opportunities for job control and social support are low. The JCQ further addresses work motivation based on opportunities for engagement in active jobs (those characterized by high job demands, high job control, and use of skills). Although this study is measuring only psychosocial job characteristics (and not job strain), the concept of active jobs as being psychologically healthy is particularly relevant to this project.

The theoretical orientation of the JCQ is both psychological and sociological in its methodologies and assumptions. From a sociological perspective, the DCM is designed to address the impact of social institutions (such as work organization) on individuals. The DCM is rooted in sociological perspectives of worker alienation and illness as a response to environmental stressors. The DCM is based on the assumption that the social environment affects individual behavior and well being (Karasek et al., 1998).

From a psychological perspective, the DCM also emphasizes the behavioral correlates of psychological distress (such as low worker control). Karasek et al. (1998) indicate that the DCM reflects a stimulus approach versus a relational approach to individual behavior. The assumption inherent to the JCQ is that behavior is generated and affected by social environments and that social demands are moderated by the freedom to exercise individual decisions. In contrast, a relational approach or a cognitive psychology approach suggests that individual decision-making is the primary driver of behaviors (Karasek et al., 1998; Quick & Tetrick, 2003).

The JCQ has five scales: decision latitude, psychological demands, social support, physical demands, and job insecurity. This study used questions from the decision latitude and social support scales. Decision latitude included the dimensions of skill discretion and decision authority. *Skill discretion* refers to the level of skill and creativity required on the job and the flexibility to decide which skills to use. *Decision authority* refers to the organization's policies that allow workers to make decisions regarding their own work. The *social support scale* addresses the extent of support from coworkers and supervisors. This scale assesses the input of support from coworkers and supervisors as well as the impact of physical help on the job and socio-emotional support.

Summary of Successful Aging and Job Design Literature

Theories of successful aging indicated that personal control and social support contribute to high levels of functioning and facilitate the process of adapting to age-related losses. Generative experiences for older adults have been considered to promote the psychosocial task of developing integrity in older age. Therefore, the variables chosen

to represent successful aging outcomes were personal control, generativity, social network, and emotional support. The assessments used to measure these variables were presented along with research to support these choices.

Both normative (Erikson, 1997; Rowe & Kahn, 1998) and adaptive (Baltes & Baltes, 1990) approaches to successful aging supported older adults' continued engagement in productive and meaningful activities such as paid employment. However, successful aging has not been associated with workplace involvement in previous studies. The DCM of job characteristics emphasized the importance of personal control over a person's job and social support from coworkers as fundamental to psychosocial health at work (Karasek & Theorell, 1990). Given the similarity of the constructs of successful aging and healthy work, it was hypothesized that jobs characterized by high levels of job control and social support may also promote successful aging for older adult. This chapter described the conceptual understanding of successful aging and insight into how job design has impacted workers in previous studies.

Chapter 3 identifies the research design for the study and describes the psychometric qualities of the instruments used to measure job design and successful aging variables. Chapter 3 provides a description of the inclusion criteria for older workers who participated in the study and describes how older workers' confidentiality and rights were protected. A justification for sample size, a description of the data collection procedures, and the data analysis process are presented next.

CHAPTER 3:
RESEARCH METHOD

Introduction

The AARP (2003) reported that Baby Boomers plan to remain in the workforce longer in order to reap both the financial and psychosocial benefits of work. As a topic in the field of gerontology, there is not a wealth of information about the extent to which current workplaces are meeting older adults' psychosocial needs. This study explored the psychosocial characteristics of work environments for older workers that may impact successful aging. The psychosocial characteristics of the workplace, or job design, refer to the psychological and social structure of the work environment (Karasek & Theorell, 1990). The expectation for this study was that healthy work environments would serve not only the health and safety needs of all workers, but more specifically, the successful aging needs of older workers (Karasek & Theorell; Wegman & McGee, 2004).

For the purpose of this study psychosocial job design variables included decision making, skill variety, social support from coworkers, and social support from supervisors. These job characteristics reflect the construct of healthy work as postulated in the DCM (Karasek & Theorell, 1990). Successful aging variables are based on normative lifespan theories of successful aging by Rowe and Kahn (1998) and Erikson (1997). This study examined one aspect of successful aging in particular, active engagement in life. Successful aging variables included perceptions of personal control, socio-emotional support (using independent measures of social networks and emotional support), and generative concerns.

The study utilized a nonexperimental, survey design in which a convenience sample of older workers employed as sales associates in the home building industry completed standardized questionnaires related to the variables under study. The results of this study identified the degree to which psychosocial job design characteristics impacted perceptions of successful aging in this sample of older workers. The outcome of this study contributes to our broader understanding of how jobs can be designed to support older adults' participation in the labor force and the degree to which workplaces may promote a healthy and successful aging process for older adults.

This chapter presents the research problem and questions, the operational definitions for the variables, the sampling methods, descriptions of the psychometric properties of the standardized assessments, the data collection methods, and data analysis procedures. A discussion on sample size explains the methodological issues related power, effect size, and statistical error.

Research Problem and Questions

The participation of older workers in the labor force will be vital to the U. S. economy in future years (DeLong, 2004; Toosi, 2004). However, few studies have examined how workplace environments influence older adults' work experiences and their perceptions of successful aging (Armstrong-Slassen & Templer, 2004; Yeatts et al., 2000). If businesses seek to maintain older workers in the workforce, then managers need to understand how the workplace can be designed to optimize their successful aging needs. The purpose of this study was to explore the psychosocial job design characteristics that may contribute to successful aging in older workers.

This study answered the following broad research question: how do psychosocial job design variables (opportunities for decision-making, skill variety, coworker support, and supervisor support) influence successful aging variables (personal control, generativity, social network, and emotional support) in employed older workers in the home building industry in Connecticut?

The following specific questions enabled the researcher to answer the broader research question:

1. What are the demographic characteristics of the sample of older workers for this study?
2. What are the mean levels of job design characteristics and successful aging variables for this study sample?
3. What is the relationship between job design variables and successful aging variables in older sales associates in the home building industry?
4. How much variance does each job design predictor variable (decision-making, skill variety, coworker support, and supervisor support) contribute to each successful aging outcome variable (personal control, generativity, emotional support, social network) in older adult sales associates in the home building industry?
5. Which job design predictor variables are the most important in predicting successful aging outcomes?

Operational Definitions of Variables

The following variables were addressed in this study. They are briefly defined here with psychometric qualities of the measurements described in subsequent sections.

Older workers: adults aged 55 and older who are employed as sales associates working part- time (<30 hours per week) or full time (30 hours or greater) in the home building industry in Connecticut (BLS, 2006).

Psychosocial workplace job design: the psychological and social characteristics of a worker's job environment. These characteristics were examined at the task level for the individual worker (Karasek & Theorell, 1990). The psychosocial job design variables included decision authority (opportunities to make decisions), skill discretion (opportunities to use a variety of skills), coworker support (support from other workers) and supervisor support (support from one's superiors). These job characteristics were measured using the following scales of the JCQ respectively: decision authority, skill discretion, coworker support, and supervisor support (Karasek, 1985).

Successful aging: maintaining high levels of physical, cognitive, psychosocial, and adaptive functioning in older adults (Baltes & Baltes, 1990; Erikson, 1997; Rowe & Kahn, 1998). One component of psychosocial functioning, active engagement with life was addressed in this study (Rowe & Kahn). Active engagement was measured through examining personal control, generativity, social network, emotional support, and generativity in older workers. Each variable is discussed individually.

Personal control: the perception that individuals are responsible (generally) for events that occur to them and that they can control their life events (Eizenman et al., 1997; Ross & Wright, 1998; Wallhagen & Lacson, 1999). Personal control was measured through the Mirowsky-Ross 2 X 2 Index of Sense of Control (Mirowsky & Ross, 1991).

Generativity: opportunities for older adults to pass along wisdom to younger generations (Erikson, 1997; McAdams & de St. Aubin, 1992). Generativity was measured through two scales on the Loyola Generativity Scale: passing skills on to younger generations and being creative and productive (McAdams & de St. Aubin).

Social network: the number of close social contacts. Social networks were measured through the Social Network scale used in the MacArthur Studies of Successful Aging (Seeman et al., 2001).

Emotional support: the degree of affection and respect that individuals experienced from their social contacts. Emotional support was measured through the Emotional Support scales used in the MacArthur Studies of Successful Aging (Seeman, et al., 2001).

Hypotheses

The hypothesis is a statement about relationships among variables in a study. The null hypothesis proposes no relationships among study variables and is the basis for statistical hypothesis testing. The alternative hypothesis is the outcome that is expected to occur (Munroe, 2005).

Null hypothesis. Psychosocial job design variables (decision making, skill variety, supervisor and coworker support) will not predict the variance in successful aging outcomes (personal control, generativity, social networks, and emotional support) in older sales associates in the home building industry in Connecticut.

Alternative hypothesis. A weighted combination of job design variables (decision making, skill variety, supervisor and coworker support) will predict successful aging

outcomes (personal control, generativity, social networks, and emotional support) in older sales associates in the home building industry in Connecticut.

Research Design

The study employed a cross-sectional survey research design in order to explore the relationship between the constructs of psychosocial job design and successful aging (Babbie, 2004; Creswell, 2003). A survey design was the most feasible method of gathering quantitative information on multiple variables from a large sample of respondents that could not be observed directly (Babbie; Creswell). Participants were recruited via personal visits to home building stores or by introduction by the business owners of independently owned home building stores. Self-administered questionnaires were personally handed out to each participant at work, and either collected personally or mailed back to the researcher. Further sections describe the data collection process in more detail.

Sample Characteristics

Sample Inclusion Criteria

The population for the study was workers aged 55 and older employed as sales associates in the home building industry in Connecticut. The sample for the study was a convenience sample derived from older workers employed in national corporations and independently owned home building stores in Connecticut. A nonprobability, purposive sampling approach was used. As discussed in chapter 2, the job position of a sales associate is currently one of the most common jobs for older workers (18% of all older

workers work as a sales associate in some industry) and is expected to employ a high percentage of older workers in the future (GAO, 2001).

The home building industry was chosen because of the opportunity to survey a large number of workers in one type of industry. Purposive sampling of one type of job position, a sales associate, was used in order to reduce the variation found in the job content, job focus, and design of the job among study participants. This approach of collecting data from a particular occupational sample enabled the researcher to make valid assertions about older workers' perceptions of their job characteristics and perceptions of successful aging in this particular job position (given a response rate of least 50% [Babbie, 2004]).

The inclusion criteria for the study were workers aged 55 or older and employed full-time or part-time as a sales associate in the home building industry. As a sales associate (or a related title) a worker must have had regular contact with customers on a daily basis. Participants needed to be proficient in the English language (enough to complete the surveys) and willing to complete the study. Further, they needed to be employed by a company.

Sample Size Requirements

Sample size for the study was based on multiple requirements such as power, effect size, significance level, and variability in instrument measures (Katz, 2006; Munroe, 2005; Triola, 2005). The probability of making a Type I error (alpha), rejecting the null hypothesis when it is true, was addressed by adjusting the significance level to

minimize the chances of a false association among variables. For this study the significance was accepted at .05, indicating that only a 5% chance exists that the results could occur by chance alone. If the significance level was decreased to $p < .01$, this may have minimized the chances for a Type I error, but may have increased the potential for a Type II error and decrease the power (the chance of detecting a significant association) (Munroe, 2005).

Methods to decrease the potential for a Type II error included: having an adequate sample size, minimizing extraneous variability, and increasing the effect size. Statistical power analysis allows one to determine how likely statistical significance can be achieved with a particular sample size given an assumed association. If the likelihood is good (e.g. greater than or equal to an 80% chance) then the sample size is considered adequate. A power of .80 is generally accepted as an adequate level to detect a significant association among variables that will support the alternative hypothesis when it is true (Cohen & Cohen, 1983; Munroe, 2005; Triola, 2005). The effect size refers to the anticipated size or strength of the relationship between the sets of independent variables (in this case job design variables) on dependent variables (in this case successful aging variables). It was anticipated that there would be a moderate effect of the independent variable on the dependent variable due to the similarities in core constructs of the two theoretical constructs of healthy work (Karasek & Theorell, 1990) and successful aging (Rowe & Kahn, 1998). Further, the decision latitude scale of the JCQ has detected significant differences in decision authority among occupational

populations; and thus appears to be a sensitive measure to individual and occupational differences (Karasek et al., 1998).

Certain rules of thumb have been offered in the literature. Typically, larger sample sizes are needed to show a small effect size or a small (yet statistically significant) outcome. Concomitantly, the smaller the sample size, the larger any difference between group scores will have to be in order to achieve statistical significance (Katz, 2006).

Determination of Sample Size

The software program GPower 3 (Faul, Erdfelder, Lang & Buchner, 2007) was used to determine the required sample size to test the null hypothesis. GPower provides the sample size based on the chosen effect size (ability to identify an effect or outcome), value for alpha (probability of a Type I error, which is rejecting the null hypothesis when it's true), and power value (probability of detecting significance in order to support the alternative hypothesis when it is true). The statistic chosen to determine sample size requirements was multiple regression, a multivariate statistic used to explore the extent to which a set of independent variables can predict a particular outcome (dependent variable) (Munroe, 2005).

According to the program, the desired sample size for this study was 109 based on having eight variables, a medium effect size (.15), an alpha of .05, and a power of .80 (Faul et al., 2007). Since previous discussions established the stability of the tests, there was no need to inflate this number to accommodate test measurement variability.

However, it was acknowledged that a higher number of participants may be recruited to account for drop-outs and to maintain at least a 50% response rate. Babbie (2004) and Dillman (2007) suggest that a response rate of at least 50% is adequate for analysis. An adequate response rate from survey respondents ensures a representative sampling and minimal response bias.

Response Rate and Characteristics of Responders versus Nonresponders

Response rate. A total of 142 older workers were invited to participate in the study. One hundred and fifteen (115) older workers completed the surveys for a response rate of 81%. However, three surveys were not used because the job descriptions did not meet the inclusion criteria for the typical job status and tasks associated with the job of a sales associate. One older worker was a driver and had minimal contact with customers; one worker repaired screens with no customer interaction; and one respondent was the sole owner, manager, and worker in his own store. Thus, he was not an employee working for a company. Additionally, three surveys were not used because numerous responses were left unanswered (some respondents had skipped an entire page).

The decision was made to include all workers in the sample who had primary responsibilities for serving customers' needs and selling products, even if they also had supervisory responsibilities. Thus, workers with managerial/supervisory tasks, specialty functions, and cashier responsibilities, were included in the study provided they interacted with customers and coworkers on a regular basis. Thus, the final sample size

was 109. This number met the targeted sample size of 109 for statistical power, effect size, and significance.

Description of nonresponders. The group of individuals who refused to take the survey or who did not return surveys were designated as nonresponders ($n = 27$). The characteristics of nonresponders differed in age and gender from the final sample of responders who participated in the study.

A higher percentage of the nonrespondent group were older and were female than the respondents who participated in the study. In the nonrespondent group, 40.7% (11) of participants were aged 55 to 64 and 59.3% (16) of the nonresponders were aged 65 or older. In the respondent group (final sample), 58.7% (64) of participants were aged 55 to 64 and 41.3% (45) of individuals were 65 or older. Thus, males aged 65 and older were less willing to participate in the study and less represented than males aged 55 to 64. Males in the older category of workers stated informally they did not complete the study because they were “too busy”, “don’t want to”, “too much personal information”, or “I don’t do those things”.

A difference was also noted in the gender distribution between the nonrespondent and respondent group. Of the nonrespondent group, 28.5% (7) was female; whereas in the respondent group (final) 17.4% (19) were female. Some women expressed fear of jeopardizing their jobs if they participated in the study. Women were more likely than men to agree to take a survey but not send the survey back.

Measurement Instruments

The study used four standardized instruments to gather information necessary to answer the research questions. All instruments except for the Social Network scale relied on ordinal, Likert-type response scales. Completion of these self-report measures took about 10-15 minutes in total. Table 1 provides an overview of the variables, the codes, and the respective resources for variables.

Table 1

Codes and Sources of Research Variables for the Study

Variable code	Test variable	Source of test items
SkillDisForm	Skill discretion	JCQ
DecAuthForm	Decision authority	JCQ
CoSupForm	Coworker support	JCQ
SuSuForm	Supervisor support	JCQ
SocNetForm	Social network	MacArthur Social Network scale
EmotSupForm	Emotional support	MacArthur Emotional Support scale
PersConForm	Personal control	Mirowsky-Ross Index of Sense of Control
LoyGenForm	Generativity	Loyola Generativity Scale

Job Content Questionnaire

The JCQ is a self-administered scale that was used to measure psychosocial job design characteristics. The test is divided into five scales that reflect the construct of

healthy work in the DCM (Karasek et al., 1998). Two scales were used for this study: decision latitude and social support. The *decision latitude* scale is subdivided into skill discretion and decision authority subsections. *Skill discretion* is the level of skill and creativity required on the job and the flexibility to decide which skills to use at a given time. *Decision authority* refers to the organization's policies that allow workers to make decisions regarding their own work. The *social support* scale also has two subsections: support from coworkers and support from supervisors. Social support refers to the overall level of helpful social interaction received from coworkers or supervisors respectively (Karasek & Theorell, 1990).

The format for the JCQ is a 24-item self-administered questionnaire in which the participant responds to questions according to the four-point Likert scale: *strongly disagree* (1), *disagree* (2), *agree* (3), and *strongly agree* (4). Each response has the associated numerical score in parenthesis. In this study, the following subscales represented the four job design characteristics: decision authority, skill discretion, coworker support, and supervisor support.

The scores for each question were recorded, weighted, and summed to obtain a raw score for each subsection scale (such as decision authority or skill discretion). The number of questions and scoring formula for each scale were as follows: In the JCQ, each scale has three to six questions that form the designated variable (decision authority, three questions; skill discretion, six questions; supervisor support, four questions, and coworker support, four questions). Each scale is summed and weight according to the formulas provided by the JCQ scoring manual (the higher the mean score the higher the

level of each job content characteristic). Because the number of questions differs for decision authority and skill variety, these two scales are multiplied by a constant to allow a comparison. The formula for skill discretion is $[Q3+Q5+Q7+Q9+ Q11+(5-Q4)] \times 2$. The formula for decision authority is $[Q6+Q8+Q7+Q10] \times 4$. Individual subscales were used to measure the specific variables for this study (Karasek, 1985).

Internal consistency of the JCQ scales has been consistent across international populations and between men and women (Karasek et al., 1998). Chronbach's alpha coefficient, a measurement of internal consistency (the extent to which item responses within a scale correlate with each other) were .73 for women and .74 for men for the entire instrument. Within the JCQ instrument scales the highest alpha coefficients were obtained for decision latitude (.83), supervisor support (.85), and coworker support (.80) scales. An alpha coefficient of .70 is considered to be the minimum value in order to minimize the standard error of measurement (Allen & Yen, 2002). Lower coefficients of .60 may be acceptable for exploratory studies (Mirowsky & Ross, 1991). Test-retest reliability using occupation as the unit of analysis shows a correlation of .90 or higher for each of the scales (Karasek & Theorell, 1990).

Mirowsky - Ross 2 X 2 Index of Sense of Control

The Mirowsky - Ross 2 X 2 Index of Sense of Control (1991) was used as a generalized measure of personal control. The index consists of eight questions that measure respondents' perceptions of control over their lives. Perceptions of control are operationalized as claiming control over good outcomes ("I am responsible for my own

successes”), claiming control over bad outcomes (“My misfortunes are the result of mistakes I have made”), denying control over good outcomes (“The good things that happen to me are mostly luck”), and denying control over bad outcomes (“I have little control over the bad things that happen to me.”). Responses are also scored along a 4-point Likert Scale indicating level of agreement with the statements. The items were scored as follows: For responses to claiming control questions (questions one through four) items are scored as *strongly disagree* (1), *disagree* (2), *agree* (3), and *strongly agree* (4). Response for lack of control questions (questions five through eight) are coded in reverse. From these responses, a mean score of all responses personal control was created that ranges from a low sense of control (1) to a high sense of control (4).

Chronbach’s alpha coefficient for this index is .68 indicating an acceptable level of internal consistency given that the scale is a relatively short measure (Ross & Wright, 1998; Mirowsky & Ross, 1991). The test has demonstrated acceptable stability for test-retest reliability. At the item level, test-retest reliability using weighted kappa revealed moderate to substantial agreement (.41 to .66) for all except one question (.38) (Mirowsky & Ross; Wolinsky, Wyrich, Metz, Babu, Thierney, & Kroenke, 2004). For ordinal rankings or better, weighted kappa can be used to weight each cell in the agreement/disagreement table by a weight between 0 and 1, where 1 corresponds to the row and column categories being the same and 0 corresponds to the categories being different.

At the scale level, test-retest reliability 1 to 4 days after taking the original test revealed an intraclass correlation coefficient (ICC) from .69 to .71 stratified by the

number of days between the test and the retest (Mirowsky & Ross, 1991; Wolinsky et al., 2004). ICC refers to the ratio of between-groups variance to total variance (Munroe, 2005). ICCs were also calculated within categories of demographic, socioeconomic, psychosocial, and functional status characteristics with no appreciable differences.

MacArthur Studies Socio-emotional Support Scales

Two social support scales examined the number of social ties (called social networks) and quality of emotional support experienced by older workers. The Social Network scale includes questions related to the number of close ties with children, family, and friends. The summary measure of Social Networks reflects the number of close relationships with children, friends, relatives, marital status (yes or no), and group participation (based on participation at least monthly). The number is summed and recorded as an interval measurement such as 6, 7, 8, and so on (Seeman et al., 2001).

While the scale requests numeric responses, in some cases qualitative responses were given for the number of close contacts with children, friends, and family (such as “both” or “all”). The qualitative responses for the *number of children who are close to you* were assigned numerical values as follows: the response of “both” was scored as 2; the response of “all” was scored as 3. The decision to interpret these responses was based on a precedence of “both” indicating 2 (Webster Dictionary, 2009); the scores of 3 for “all” was the most conservative estimate of a number greater than “both” or 2.

When the responses “many”, “a lot”, “too many”, and “numerous” were given relative to the number of *close friends*, the mean number of friends in the sample was

used. These interpretations and procedures were reviewed by the primary author of the Social Network scale (Seeman, personal communication, September, 10, 2008).

The Emotional Support scale measures the frequency of receiving emotional support from the network of friends and family. Participants responded to six items that measure support from a spouse, children, friends, and family using a 4-point scale: *never* (1), *rarely* (2), *sometimes* (3), and *frequently* (4). The summary measure of the Emotional Support scale reflects the average reported frequency of emotional support across the 6 individual questions. The two social support scales (Social Network and Emotional Support) were analyzed and reported independently (Seeman, 2007). Chronbach's alpha for both the Social Network and the Emotional Support scales are .60. The 12 month test-retest correlation is .73 for the same scales (Seeman et al., 2001).

Loyola Generativity Scale

The LGS is a self-report scale that assesses an individual's generative concerns across five dimensions. Two dimensions of generativity were used for the purposes of this study: passing skills on to younger generations and being creative and productive. The scale consists of six questions that reflect the two dimensions of generativity measured. Each item was rated on a 4-point, Likert-type scale that reflects the frequency of expressing commitment or concern related to the statement: 1) *the item never applies*, 2) *occasionally or seldom applies*, 3) *applies fairly often*, and 4) *applies very often*. Individual scores in the two subsections were summed to create an overall generativity score for the study (McAdams & de St. Aubin, 1992).

Chronbach's alpha coefficients were calculated on samples of adults as .83 suggesting that the scale has high internal consistency for this population. Test-retest reliability over a 3- week period was .73 suggesting moderately high stability. Mean scores on the LGS were not significantly different for the two administrations (McAdams & de St. Aubin, 1992).

Assumptions Relative to Measurement of Variables

Certain assumptions must be addressed about the nature of the measurement tools in order to ensure validity of the study outcome. Assumptions are presented relative to the validity of self-report instruments, the use of ordinal scales, variability in measurement scales, and multi-collinearity.

Validity of Self-report Instruments

Self-report instruments have been criticized relative to the validity of the instrument in correctly reflecting the true answers. Discussions in favor of self-report instruments suggest that the validity depends on the structure of the questions and the extent to which the responses require a complex cognitive burden or evaluation from the respondent (Frese & Zapft, 1988). In the JCQ, respondents report objectively about job characteristics (which is, of course, their subjective impression) but minimize their emotional evaluation of these characteristics (i.e., they do not indicate whether the qualities are good or bad) which minimizes further cognitive assessment. It has been found that participants' interpretations of job design characteristics for particular work

environments are extremely consistent among international samples. This finding demonstrates the consistency of this self-report measure (Karasek et al., 1998).

Use of Ordinal Scales in Multivariate Studies

Another assumption relates to the use of ordinal scales in correlational and multivariate studies. Most scales in this study use a Likert-type, 4-point scale. In these scales higher rankings are associated with higher levels of a particular characteristic. The standardized scales chosen for this study are designed so that positive and negative values of a characteristic are equally represented throughout the scale (i.e., two agree and two disagree statements) (Karasek, 1985; Mirowsky & Ross, 1991). Although true equality between subjective intervals does not exist in ordinal scales, the practice of measuring a characteristic in equal units across the measurement scale diminishes systematic inequality of the intervals (such as more positively scaled points on one end of a scale). Further, individual ordinal level questions can be collectively averaged to represent an interval level scale and thus fulfill the ideal criteria of utilizing interval level data for statistical analysis (Cohen & Cohen, 1983).

The assumption of homoscedasticity is difficult to assume since the four scales used in this study may not have the similar variances or levels of a characteristic. Thus, homoscedasticity will be a limitation to the study.

Variability in Measurement Instruments

Variability and instrument stability. The variability of measurement scales impacts the sample size needed (Munroe, 2005). The larger the variability of the measurement, the larger the sample size needed to determine a true effect (Allen & Yen, 2002; Munroe). Variability of measurement scales can be determined by several methods. The standard deviation identifies the variation in scores from the mean of a sample. The coefficient of variation (*SD* divided by the mean) can determine the variance among variables across different samples and different studies. Test-retest reliability scores determine the variability in the measurement scores over time (Allen & Yen; Munroe; Triola, 2005).

In this study, the variability of the JCQ subscales has been studied across samples in the United States and internationally (Karasek, et al., 1998). Karasek et al. found that subscales of decision-authority, skill discretion, supervisor, and coworkers support were extremely stable across randomly selected samples in the United States. Calculations of CV show minimal variability across large samples of 4300 white and blue collar workers (for example the CV for skill variety was .220 in one large sample, and .224 in another large U. S. sample; the CV for supervisor support was .250 in one study and .252 in another large cohort). Further, the test-retest reliability for specific occupations was .90, demonstrating high reliability. Thus, the JCQ is considered to be a stable scale.

The Social Networks and the Emotional Support scales also showed high levels of stability and minimal variability within the same samples over time. In a study of the

psychometric qualities of the Socio-emotional Support scale, the CV for the Social Emotional Support Scale was .25. In a study examining change in the number of social ties in older adults from 1988 to 1995, the numbers increased from 10.6 in 1988 to 10.9 in 1995 with a *SE* of 5.4 at both measurement points (Seeman, Luisignolo et al., 2001).

The Mirowsky-Ross 2 X 2 Index of the Sense of Control is considered to be an overall stable scale with an ICC of .71 for 1 to 4 day rest-retest reliability across categories of demographic, psychosocial, and functional status characteristics. At the item level weighted kappa ranges from .38 to .66. (Ross & Wright, 1998; Mirowsky & Ross, 1991).

Finally, the Loyola Generativity Scale showed a low coefficient of variation at .236 for men and .184 for women in a sample of 70 individuals aged 25-74. The test-retest reliability after three weeks was .73, suggesting moderately high temporal stability (McAdams & de St. Aubin, 1992). The coefficient of variations for mean scores at Time 1 and Time 2 were .219 and .215 which were not significantly different (McAdams & de St. Aubin).

Variances and effect sizes. The effect size, the magnitude of the effect of independent variables on the dependent variables, was addressed and estimated in order to determine sample size. If effect sizes are estimated to be small (based on previous literature), then sample sizes must be large in order to detect the associations (Munroe, 2005). Research studies using the instruments selected for this study showed large effect sizes among differing sample populations. For the JCQ, between-occupation variances in a random sample of 4300 workers who completed the JCQ were 45% for decision

latitude (combining decision authority and skill discretion) and 4% for social support. These findings suggest a large effect size for decision latitude but a smaller effect size for social support. There were no strong age correlations reported with any of the scales in the JCQ (Karasek et al., 1998).

The Mirowsky-Ross 2 X 2 Index of Sense of Control identified a large effect size between men and women in personal control and employment status, gender, education, social interaction, and decision-making. All variables were significant at the $p < .01$ level in predicting a lower sense of control for women (Ross & Wright, 1998). The Loyola Generativity Scale detected moderately significant differences in levels of generative concerns among young, midlife, and older adults (McAdams, de St. Aubin, & Logan, 1993).

Multicollinearity

The measurement scales selected for this study did not show high enough correlation among individual variables to assume multicollinearity. Munroe (2005) suggests that correlations of .8 or higher between subscales could be considered multicollinear and thus problematic. In this study the JCQ scales of skill discretion and decision authority were correlated at .57 (similar to correlations in normative studies at $r = .55$ [Karasek et al., 1998]). Coworker and supervisor support scales were correlated at .41 (similar to correlations in normative studies at $r = .40$). These outcomes suggest high correlations but not a threat of multicollinearity. In the social support scales, the Social

Network and Emotional Support scales were correlated at $r = .27$ (similar to reported correlation of $r = .22$ by Seeman et al. [2001]).

Data Collection

Data Collection Procedures

Nationwide and local home building stores were the sources for recruiting this sample of older workers employed as sales associates. In order to gain access to older workers in the nationwide home building chains, the researcher initially contacted corporate offices at Home Depot and Lowe's stores and sent a copy of the survey to corporate human resource personnel. It was hoped that district managers would be able to provide the names or locations of older workers. The stores were not interested in helping the researcher to organize older workers or disseminate surveys. However, they were not adverse to the researcher directly recruiting older workers individually while they were at work, and asking them to complete the surveys on their own time.

Therefore, in the nationwide chains, the researcher approached individual workers appearing to be at least 55 years or older, briefly explained the study, the voluntary nature of participation, and offered a Dunkin' Donuts gift card as a token of appreciation for participation (the equivalent cost of bringing coffee and donuts to the store during a break). The researcher and older worker then arranged for a time and date to return to the store to retrieve the completed survey. Each worker was given an envelope that could be sealed upon completion of the survey. This process preserved the anonymity of the participants' survey responses. If the schedules of the worker and the researcher did not

coincide (or the distance was too far to return the following day) the older worker was given a self-addressed stamped envelope to mail the survey to the researcher.

When older workers were recruited from local or individually owned hardware stores (such as True Value or Ace Hardware stores), the researcher first introduced herself to the manager and explained the study. The manager then gave his or her permission to recruit members in that store. The researcher followed a similar procedure of briefly introducing herself to the worker, explaining the study, clarifying the voluntary nature of the study, offering a token of appreciation, and then deciding on a pick-up time and date. On several occasions, some workers filled out the questionnaire immediately if they were not busy. If the older worker forgot the packet on the assigned return pick-up day, the researcher returned again to the store or provided a self-addressed stamped envelope to mail the completed surveys. In all circumstances, participants were explained the informed consent procedure, and told that participation in the study was not related to their present or future employment status. Survey packets included a letter of introduction and instructions, an informed consent, the JCQ, Mirowsky-Ross 2 X 2 Index of Sense of Control questionnaire, Social Network scale, Emotional Support scale, and the Loyola Generativity Questionnaire.

Individuals who were personally known or referred to the researcher, and who met the inclusion criteria, were also invited to participate in the study. Similarly, the researcher visited them at their jobs, gave them the survey, and returned to retrieve the survey once it was completed.

The survey packets were coded and reviewed for completeness upon return (Babbie, 2004; Dillman, 2007). The informed consents were separated from the surveys and all identifying information was removed or blackened on the survey forms. The completed questionnaires were assigned an identification number to code for data entry (Babbie; Dillman; Walters, Munroe, & Brazier, 2001).

Protection of Participants' Rights

The content and procedures for the study were approved by Walden University Institution Review Board and were given the approval number 02-22-08-0289222. All risks and benefits of the study were explained to potential participants prior to participation and prior to signing the informed consent form. No modifications to the survey administration process were necessary for the survey participants. On one occasion an older worker sought assistance from his daughters for mild difficulties with reading English. In each case, the voluntary nature of the survey was clearly indicated to the participant. As stated, it was clarified that the survey was not related to employees' job status.

Confidentiality of participants' responses was maintained by eliminating identifying information on the test forms and assigning a code to each test packet. Data was secured in a locked file in the researcher's home office. Participants' names were not shared or provided to anyone else involved in the study.

Data Analysis

Data were analyzed using Statistical Package for Social Sciences (SPSS) Version 15.0. Demographic information was analyzed descriptively to summarize the range, mean, standard deviations, and frequencies relative to the participants' ages, gender, educational level, employment history, and perceived level of health for this sample of older workers. Data for open ended questions such as job description and employment background was recorded, categorized for similarity in responses, coded, and then counted for frequency of similar responses.

Scoring of Tests

The final summative scores for the identified scales and subsections were calculated according to the standardized instructions for each test. Questions from the JCQ were scored for each subsection (Karasek, 1985). Questions from the Mirowsky-Ross 2 X 2 Index of Sense of Control Scale yielded one summative, personal control score. Responses from the MacArthur Social Support scales yielded two scores: one for the Social Network scale and one for the Emotional Support scale. The Emotional Support scale score was derived by taking the average reported frequency of interactions across network ties (1 = *never*, 2 = *rarely*, 3 = *sometimes*, 4 = *frequently*). The total score for the Social Network scale represented a sum of the number of close ties with children, friends and family, marital status (dichotomous yes or no), and group participation (dichotomous yes or no for monthly participation or more).

For the Social Network scale, several questions asked for “the number” of close children and friends or family. When qualitative responses were given such as “both” or “all” for the number of children, the numbers 2 (for both) and 3 (for all) were assigned. The decision to interpret the responses was based on the definition of “both” indicating 2 as indicated by Webster Dictionary; “all” was the most conservative estimate of a number greater than “both” or 2. When the qualitative responses “many”, “a lot”, “too many,” and “numerous” were given relative to the number of close friends, the mean number of friends in the sample was used. These interpretations and procedures were reviewed by the first author of the Social Network scale (T. Seeman, personal communication, September 17, 2008).

Finally, a summative score for the Loyola Generativity Scale was derived from the average scores of questions related to passing along wisdom to others and creativity/productivity. The scale requested a numeric score for each item. If a participant responded with a “no”, “yes”, or a check, a “no” was assigned 1 (*never applies*), a “yes” was assigned a score of 3 (*applies fairly often*), and a check was also assigned a 3. This scoring interpretation was agreed upon by the primary author of the Loyola Generativity (D. McAdams, personal communication, September 15, 2008).

Missing data. When responses were not provided for other scored tests, statistical calculations were based only on those respondents who answered the questions. No substitutions were made for other missing data.

Statistical Procedures

Descriptive statistics. Descriptive statistics were completed for all demographic data and for responses to ordinal level questions (i.e., frequency of responses according to rating). In most cases the mean, standard deviation, and range were reported for each variable. The median was also used to report data that included extreme values (i.e., the Social Network scale).

Chi-square. Chi-square is a nonparametric technique in which the expected frequencies for a particular data set are compared with actual observed frequencies found in the sample. The chi-square analysis for independence compares the frequency of case data found in one variable across different variables under study and determines whether two categorical variables such as male-female and marital situation (single, married, divorce) are related (Pallant, 2005; Triola, 2005). As chi-square is a nonparametric technique the assumption of a normal distribution of responses is not necessary (Triola, 2005). However, the assumption is that the minimum expected cell frequency should be five for at least 80% of all the cells. The value obtained from the chi-square analysis is the Pearson chi-square value (Pallant, 2005).

Data for the chi-square analysis is presented in a contingency table in which the categorical data is presented in rows and columns.

$$\text{The test statistic is } \chi^2 = \sum \frac{(O - E)^2}{E} .$$

For the purposes of this study, chi-square was used to more fully examine the demographic data to understand the differences in frequencies among demographic

variables according to pertinent categories such as gender, income, marital status, living situation, perceived health, education, employment status, and organizational structure.

Multiple regression. Multiple regression is a group of statistical techniques that explore the relationships between a continuous dependent variable and a number of predictor variables or independent variables (Munroe, 2005; Pallant, 2005). Multiple regression statistics was used to determine how well the job design variables explain a proportion of the variance in successful aging outcomes. Multiple regression additionally examines the relative importance of each independent variable at predicting dependent variables (i.e., successful aging outcomes) when the effects of other variables are controlled (Pallant). Demographic information such as age, gender, health status, full or part-time status, socio-economic status, and education were used as descriptors to describe the sample but were not used as additional variables.

The product of MR analyses is a regression equation that describes the dependent or outcome variable as equal to a constant plus the sum of the slope (*b*) times the independent *X* variables. The constant is also referred to as the *intercept* and the slope as the *regression coefficient* or *B coefficient* (Munroe, 2005; Pallant, 2005). Multiple regressions are interpreted in terms of the significance of the multiple correlations and the significance of each B-weight or independent variable in the equation. The process of testing the B-weights indicates whether the independent variable contributes significantly to the variance in the dependent variable (Munroe).

The regression equation is: $y = a + b_1X_1 + b_2X_2 + \dots + b_kX_k$.

The use of multiple regression was based on a number of theoretical assumptions:

(a) The sample must be representative of the population; thus, an adequate sample size with response rate of 50% or greater was targeted in a homogenous sample of older workers in a specific type of job (sales associate in the home building industry) for this study (Pallant, 2005);

(b) The variables must be normally distributed (Munroe, 2005; Pallant, 2005);

(c) The relationship between sets of variables and should be linear (Munroe, 2005; Pallant, 2005);

(d) Independent and dependent variables cannot be so closely related to each other that the differential impact of variables can not be identified (multicollinearity). The previous discussions on test measurements indicated that multicollinearity was not found with these measurement tools (Cohen & Cohen, 1983; Munroe, 2005);

(e) The variables must have approximately equal variances for all variables measured with the set of IV for the study and between different sets of dependent variables (homoscedasticity) (Allen & Yen, 2002; Katz, 2006; Munroe, 2005; Pallant, 2005). As discussed previously, homoscedasticity was not ensured in this study;

(f) The ideal level of measurement for multiple regression is interval level data. However, ordinal-level and categorical level data can be used (Pallant, 2005). In this study, sets of ordinal level Likert-type questions were summed or averaged to form interval level scales. Thus they can be considered interval level data (Cohen & Cohen, 1983).

Standard multiple regression analyses were performed for each of the dependent variables: personal control, generativity, emotional support, and social network. Each dependent variable was regressed on the four predictor variables. The independent variables (the job design variables) were inputted and examined to determine the greatest predictive combination of job design characteristics for a particular successful aging variable.

A standard multiple regression was first performed to determine initially the amount of variance that all job design variables (as a group) contributed to successful aging; then, the unique contribution of each independent variable to the overall variance in the dependent variable (specific successful aging outcome) was examined through part and partial correlations.

Results of correlation analyses showed no evidence of multi-collinearity among dependent variables (defined as $r = \geq .7$ or $r = \geq .8$ for bivariate analysis) (Katz, 2006; Tabachnick & Fidell, 1996). Other collinearity statistics (tolerance and variance inflation factor) did not show high variances in the independent variables that could be explained by other independent variables in the model. Cut off values for tolerance was $< .10$ and variance inflation factor (VIF) was 10 or greater using SPSS (Pallant, 2005). Outliers were defined as those with standardized residual values above 3.3 (or less than -3.3).

Effect size calculations. Effect size calculations were conducted to determine the magnitude of the effect of the independent variable on the dependent variable and the extent of difference between means of independent samples (Munro, 2005). The effect size is worthwhile to compute because, although differences between samples may be

statistically significant (especially with large samples), the effect size can indicate the extent to which differences are practically significant relative to the variables under study (Tabachnick & Fidell, 1996). The computation of effect size varies according to the statistic used. The effect size calculations used for this study included Pearson r correlation, Cohen's d , Cohen's f^2 , and phi. The use of each effect size statistic is briefly reviewed.

Pearson product-moment correlation is used to determine effect size when the data are continuous and potentially related, although causality is not inferred. Thus, the Pearson product-moment calculations can indicate not only the presence of an association and the direction, but also the strength of the relationship. According to Cohen and Cohen (1983), the values related to strength of the association are: .1 = small effect, .3 = moderate effect, and .5 = large effect.

Cohen's d can be used to examine the effect size of difference in means between two independent samples. Cohen's d is calculated as the difference between two means divided by the standard deviation of the entire sample. Cohen's d is therefore an appropriate to use to examine the differences between means for independent samples t tests. Effect sizes for Cohen's d statistic are: small, $d = .2$, medium, $d = .5$, and large, $d = .8$ (Cohen, 1988).

Cohen's f^2 is a calculation that can be used to measure the effects of f tests in ANOVA and multiple regression analyses. Cohen's f^2 is defined as R^2 divided by $1 - R^2$. The f^2 effect sizes are interpreted as small = .02, medium = .15, and large = .35 (Cohen, 1988).

The effect size for a chi-square analysis test for independence with one degree of freedom can be computed by taking the square root of the chi square statistic (χ^2) divided by the number of cases, N . This value is also known as phi and is interpreted as the same magnitude as Pearson r values. When there is more than one degree of freedom, then Cramer's V is often the preferred measure of effect size. Cramer's V is similar to phi except that the denominator is calculated as N (df) (Pallant, 2005).

Threats to Validity

Threats were minimized by using a homogenous sample of workers in one particular job position, sales associates in the home building industry. This approach increased the representation of one job and decreased the sample variability. The threat of not identifying a significant effect (Type II error) was minimized by using an adequate sample size for the study. The sample size determination for this study was based on using a medium effect size (.15) and a power of .80. An adequate sample size based on this effect size was meant to increase the sensitivity of the statistical tests at identifying the effect of independent variables on the dependent or outcome variable (Faul et al., 2007). The study was further strengthened by using standardized tests that demonstrated measurable effects in previous research studies involving older adults (Bird & Mirowsky, 1993).

However, the study utilized a convenience, nonprobability, sampling method; therefore, one cannot dismiss the potential for self selection in the participation process. Other threats to validity included lack of equal gender distribution (fewer women occupied this particular job position) and lack of diversity. Therefore, one must be careful

in generalizing to all older workers in this industry. Further, the survey instruments for Social Network and Emotional Support scale were not developed for the workplace, so they may not have been sensitive enough to detect different types of social relationships established within the workplace. No apparent historical or unplanned events related to personal threats or workplace policies appeared to impact workers' attitudes toward their jobs or perceptions of personal control.

Overall, this study's outcome can only be generalized to older adults (primarily men) working as a sales associate in the home building industry in Connecticut. However, this job position constitutes a strong option for older adults re-entering the labor force. The concepts are relative to older adults and managers seeking to understand how best to manage older workers.

Summary

Chapter 3 provided the methodological information and justification necessary to conduct the study. The research design was a nonexperimental, survey using nonprobability sampling. This sample size of 109 was designated as the appropriate number of participants to achieve a power of .80, medium effect size (.15), and statistical significance of $p < .05$ for eight variables (Frau et al., 2007). The statistics used to analyze the data included frequency distributions, chi-square, t tests, and multiple regression analyses. Threats to validity were discussed relative to self selection of participants and lack of diversity among participants. The implications for these threats are limited generalizability of results.

In Chapter 4, the results of the study are presented. These results highlight the demographic characteristics of the sample as a healthy group of older workers who indicate positive perceptions of job characteristics and successful aging.

CHAPTER 4:

RESULTS

Introduction

The purpose of this study was to identify job design characteristics that may contribute to successful aging in a sample of older workers. The population for the study was workers aged 55 and older employed as sales associates in the home building industry in Connecticut. Older workers were recruited and surveyed from a convenience sample of older workers employed in nationwide chains and independently owned home building stores. A total of 142 older workers from 64 home building stores were invited to participate in the study. The number of older workers who completed the study was 115, for a response rate of 81%. The final sample size was 109 after six surveys were excluded due to inclusion criteria or incomplete responses. Three surveys were excluded because the workers' job positions did not meet the inclusion criteria for regular contact with customers (one older worker was primarily a driver; the other repaired screens) or status as an employee working for a company (one respondent was the sole owner and worker in his own store). Additionally, three surveys were not used because numerous responses were left unanswered (one respondent had skipped an entire page). This number met the targeted sample size of 109 for the a priori computed statistical power of .80, medium effect size (.15), and significance of $p < .05$ (Faul et al., 2007).

This study answered the broad research question: how do job design variables (opportunities for decision-making, skill variety, coworker support, and supervisor support) influence successful aging (as measured by personal control, generativity, social

network, and emotional support) in employed older workers in the home building industry in Connecticut?

In order to adequately address the broad question, the following specific questions were posed:

1. What are the demographic characteristics of the sample of older workers?
2. What are the mean levels of job design characteristics and successful aging variables for this sample?
3. What is the relationship between job design variables and successful aging variables in older sales associates in the home building industry?
4. How much variance does each job design predictor variable (decision-making, skill variety, coworker support, and supervisor support) contribute to each successful aging variable (personal control, generativity, social network, and emotional support) in older sales associates in the home building industry?
5. Which job design predictor variables are the most important in predicting successful aging outcomes?

The results are reported in the same sequence as the research questions are posed. This chapter presents the sample demographics, mean levels of job design and successful aging variables, the relationships between job design variables and successful aging variables, the contributions of job design variables to the variance in successful aging outcomes, and the most important job design variables at predicting successful aging outcomes. All descriptive statistics are based on a sample size of 109 unless otherwise indicated.

Demographic Characteristics of the Sample of Older Workers

Personal Background

The ages of the participants ranged from 55 to 81 years old with a mean age of 64.03 years and a *SD* of 6.26 years. The sample was divided into two age groups for purposes of comparing demographic information: 58.7% (64) of the sample was in the age group 55 - 64; and 41.3% (45) of the sample was in the age group of 65 or older.

The gender distribution of the sample consisted of 82.6% (90) men and 17.4% (19) women. An independent samples *t* test indicated there was no significant difference between the mean ages of men and women in the sample (mean age for women was 62.3 years; mean age for men was 64.4 years). The ethnic background of most participants was White (98.2%, $n = 107$) with Hispanic and “other” each representing .9% (1) of the sample.

The sample gender distribution and ethnic background represented a homogenous group of older sales associates consisting of primarily older White males (4.75 times more men than women). Although older females and workers of diverse backgrounds were underrepresented, this representation is consistent with the demographic distribution of older workers in home building stores in the geographic region sampled (Sale, personal communication, April, 15, 2008).

Marital and Living Status

The marital status of the majority of the sample was married (74.3%) or divorced (11.9%). (See Table 2 for a further breakdown of the total sample data.) Differences

existed in the percentage of older male versus older female workers in categories of marital status. Responses indicated that 80% (72 / 90) of older male workers were married whereas only 47.4% (9 / 19) of the older female workers were married.

Table 2

Demographic Characteristics of the Sample

Variable	Response	Percent (%)	<i>n</i>
Marital status	Single	6.4	7
	Married	74.3	81
	Divorced	11.9	13
	Widowed	7.3	8
Living situation	Live alone	11.0	12
	Live w/ family	10.1	11
	Live w/spouse	76.1	83
	Other	2.8	3
Health rating	Excellent	23.1	25
	Above average	41.7	45
	Average	28.7	31
	Below average	4.6	5
	Poor	1.9	2
Educational attainment	Junior high school	.9	1
	High school	36.7	40
	Two year college	30.3	33
	Four year college	23.9	26
	Graduate classes	7.3	8
	Masters degree	.9	1
Income level	1- 20,000	3.7	3
	21-40,000	20.2	22
	41-60,000	17.4	19
	61-80,000	22.0	24
	81-100,000	6.4	7
	>100,000	6.4	7
	Did not respond	24.8	27

Note. The total *n* is 109 unless otherwise indicated.

The living situation for over 75% of the participants was residing with their spouse or significant other (see Table 2). Close to 20% of all participants lived alone or with a family member; few older workers were engaged in other living situations (such as with a friend). Differences existed in the living situations between older male and older female workers with a higher percentage of males than females living with their spouses and a higher percentage of females than males living alone or with a family member.

The sample demographics related to marital status and living situation indicate that older male workers tended to be married and living with spouses while older female workers tended to be non-married (single, divorced, or widowed) and living alone or with a family member.

Self-reported Health, Education, and Income

Self-reported health. The majority of the sample respondents perceived their health to be average, above average, or excellent (93.5%, $n = 101$) leaving only 6.5% (7) of workers who perceived their health to be below average or poor (see Table 2). A higher percentage of older female workers perceived their health to be above average or excellent (79%) as compared to older male workers (61.7%).

The self-reported health of older workers appears to be consistent with the physical requirements necessary to meet the job demands for a retail sales associate (BLS, 2003b) and the specific job demands for a sales associate in the home building industry (U. S. DOL, 2005). Such physical demands include sufficient physical endurance to stand continuously in addition walking, lifting, moving items, and climbing

ladders throughout one's shift. Thus, workers' perceived good health appears to be consistent with their need to perform the physical job demands in this industry.

Educational background. Responses to questions regarding the highest educational attainment indicated that 99.1% (108) of the total sample had completed high school or beyond; 62.4% (68) had received some college education or more; 32.1% (35) had earned a bachelor degree; 8.2% (9) had taken graduate level classes; and .9% (1) had completed a master degree or beyond. There was no difference in the educational attainment of male and female older workers (see Table 2 for frequency of educational attainment according to grade completed).

The educational attainment for this sample was higher than the national average for completion of high school (99.1% in this sample versus 76.1% nationally) and *some* college education (62.4% in this sample versus 43.5% nationally) based on the mean age of the sample. The percentage of older workers who had received a bachelor degree (23.9%) was similar to the national average (20.3%); however, a lower percentage of the sample had completed a master's degree (.9%) than the national average of 9.3% (BLS, 2003a).

Thus, this sample was a healthy, well educated group of older adults in which over two-thirds of the sample had received some college education, an educational attainment which is above the national average. Those who were educated beyond a four year degree (8.2%, $n = 9$) were less represented than other educational categories. This sample of workers may be healthier and better educated than national populations of older adults in similar age categories.

Income levels. The income level for sample respondents was fairly equally divided among one of three categories: \$20 - 40,000 (20.2%, $n = 22$), \$ 41 - 60,000 (17.4%, $n = 19$), and \$60 - 80,000 (22.3%, $n = 24$). Almost 25% of the sample did not choose to indicate their income levels (see Table 2 for further breakdown of categories.) There was no significant difference in income levels between older male and female workers in this sample. This information suggests that the sample represents a range of income levels which may relate to a variety of social and financial motivations for working.

To summarize the demographics related to personal background, the sample was an homogenous sample of primarily older White men who were married, in above average health, and who had received some college or technical education beyond high school. Individuals in the sample may be healthier and better educated than national standards; however, they appeared to be representative of older workers who occupy sales associate positions in home building stores in Connecticut. Those categories of older workers that were underrepresented in the sample included older women (in both categories of ages 55 - 64 and 65 and older), older men aged 65 and older, those who were educated beyond a four year degree, those from diverse ethnic backgrounds, and those with poor health. While the sample represents a typical older worker in the home building industry in Connecticut (Sale, personal communication, April 15, 2008), the data cannot be generalized to diverse categories of older workers.

Work-Related Context for Older Workers

Employment Status

The employment status for the sample was reported as 60.4% (64 / 106) for full time workers and 39.6% (42 / 106) for part-time workers. The number of hours equated with full or part-time employment was not specifically designated on the survey; therefore, a limitation of the study is that discrepancies may exist between the selected employment categories (i.e., a person working 30 hours may have designated him or herself as full- or part-time). There was a significant difference in the employment status of older male versus older female workers, with older female workers more likely to be working full time than older male workers (83.3% versus 55.7%, $\chi^2 = 4.77$, $df(1)$, $p = .029$, phi effect size = .212, power = .511). This small to medium effect may be due to older females working to support themselves financially (as evident by a higher percentage of older women who were not married). However, the low power indicates that a higher sample size may be necessary to measure the effect.

Older workers in this sample had been working in the labor force a mean of 44.82 years (range 15 to 63 years; $SD = 9.22$ years). Older workers had worked in their present job from 2 months to 60 years with a mean of 9.54 years ($SD = 10.40$ years). The breakdown of duration of years at the job indicated: older workers working less than 1 year was 11.9% (12), 1 - 5 years was 34% (37), 6 - 10 years was 21.1% (23), and > 10 years was 33% (37). Overall, these results suggest that older workers have considerable work experiences that they bring to the job. They appear committed to long term employment in this industry as evidence by the fact that over 50% of the sample had been employed in their jobs for at least 6 years.

Home Building Store Organizations

Older workers were employed in home building stores with two different organizational structures: an independently owned, local, home building store (such as True Value or Ace Hardware) or a national home building corporate chain (such as Home Depot or Lowe's). Responses indicated that 62.2% (70) of the sample worked for independently owned hardware stores; whereas 35.8% (39) worked for national home building chains. When older worker demographics were compared according to organizational structure, there was no significant difference in participants' age, length of years working at the present job, and total number of years working between the two types of home building organizations.

Current Job Categories and Past Work Experience

Current job categories. Responses to open-ended questions regarding participants' job titles, job tasks, and previous job experiences were analyzed and coded for category and frequency. All current job tasks (and associated job titles) were coded into four major categories: 1) sales, 2) sales and managerial / supervision functions, 3) sales and special functions, and 4) sales and cashier. The majority of older workers in the sample worked as sales associates (61.5%, $n = 67$) with 22.9% ($n = 25$) having sales and management / supervisory responsibilities, 9.2% ($n = 10$) working as sales associates / cashiers, and 6.4% ($n = 7$) working in sales and special functions (i.e., kitchen designer).

Past job experiences. When a comparison was made between the job tasks of older workers' current and past job experiences, it was found that over two-thirds of the

sample (71%, $n = 76$) had worked in previous jobs that were specifically related to their current job position (i.e., electrical contractor now working in the lighting or electrical department of home building store; or, a previous owner of a paint store working as a supervisor in the paint department); less than one-third of the sample was working in a home building sales associate job unrelated to previous job experiences (28 %, $n = 30$). However, 100% of the sample indicated they had worked with people at some point in their past careers.

In summary, an analysis of work-related characteristics of the sample indicated that the majority of older workers had been working in a sales associate job for over five years that was related in some way to their previous job experiences. The length of time both at the job (over 50% had worked for at least 5 years at the same job) and in the workforce (a mean of almost 45 years) suggests that older workers have amassed a variety of work experiences and skills they bring to the job. Over two-thirds of the sample brought direct job experiences to the sales position that related to technical skill sets and management skills (71%), while all older workers brought experiences dealing with people and customers to the job. Results show that older workers in this sample were not short-term employees; they were engaging in sales associate jobs as long-term employment in older adulthood. This demographic information supports the importance of examining the job design for older adults to promote their continued engagement in the workforce. The depth and breadth of specific job skills older adults bring to the job may be the basis for generative experiences.

Descriptions of Variables, Units of Measurement, and Interpretation

Variable Development

The chosen variables represent key concepts in successful aging and job design theories as discussed in chapter 2. Job design variables (skill discretion, decision authority, supervisor support, and coworker support) are represented and measured through the JCQ, a well standardized questionnaire with strong psychometric data (Karasek & Theorell, 1998). In this sample, all JCQ variables were positively correlated without demonstrating multicollinearity. The highest correlations were found between skill discretion and decision authority ($r = .517, p = .000$) and between coworker support and supervisor support ($r = .409, p = .000$) which reflect the broader JCQ job design constructs formed by these variables (job control and social support respectively) as discussed in chapter 2.

Table 3

Pearson Product- Moment Correlations for Job Design Variables

Variable	1	2	3	4
1. SkillDisForm	1	.57**	.22*	.26**
2. DecAuthForm		1	.26**	.33**
3. CoSupForm			1	.41**
4. SuSupForm				1

Successful aging variables were culled from independent measures of the key psychosocial tasks in older adulthood: personal control, generativity, social support, and emotional support. Only measures of personal control have been related to the design of the workplace; the other measures of successful aging have only been related to older adult populations in general. Correlational analysis showed significant relationships among all variables except Social Network (see Table 4) suggesting that all measures (except Social Network) may reflect similarities in measuring the construct of successful aging in the workplace. The Social Network scale may not be sensitive to workplace relationships as indicated in subsequent sections and as discussed further in chapter 5.

Table 4

Pearson Product- Moment Correlations for Successful Aging Variables

Variable	1	2	3	4
1. SocNetScForm	1	.27**	-.08	.14
2. EmotSupForm		1	.23*	.35**
3. PerSensContForm			1	.32**
4. LoyGenForm				1

Units of Measurement and Interpretation for Variables

All assessments were standardized scales that were used in the format suggested for each scale (see Table 5 and chapter 3 for more detail). No scales were modified

except for the Loyola Generativity Scale in which only 2 dimensions of generativity were used. Each assessment has been used in previous research as an independent measure of the variable as discussed in chapter 2. All scales (except for the Social Network scale) used a 4-point ordinal scale to represent the values ranging from *least* (1) to *most* (4) of the particular characteristic measured.

Four subscales of the JCQ were used to measure the four job design variables: decision authority, skill discretion, coworker support, and supervisor support. For each scale, individual questions were scored on a 1 - 4 point Likert scale: (1) *strongly disagree*, (2) *disagree*, (3) *agree*, and (4) *strongly agree*. Table 5 summarizes the scoring and interpretation of scales. The summary scale scores for the coworker support and supervisor support scales are calculated as the sum of four questions with a potential score of 16 representing high levels of support (see Table 5). The scales of skill discretion and decision authority scales have differing number of questions. Therefore, the raw scale scores are multiplied by a constant in order to enable comparison among job control variables, as per the standardized scoring method (Karasek, 1986). The highest potential scores for the decision authority and skill variety scales are 48. Normative data are based on these weighted scores.

The successful aging variables, personal control, social network, and emotional support, were each taken from the independent scores of the following scales respectively: Mirowsky-Ross 2 X 2 Index of Sense of Control, MacArthur Studies Social Network scale, the Emotional Support scale, and the Loyola Generativity Scale.

Table 5

Scoring and Interpretation for Study Variables

Variable	Source of test items	Questions	Type	Derivation of scale summary score scale and interpretation
Skill Discretion	JCQ	3, 4, 5, 7, 9, 11	Likert 1-4	$[Q3+Q5+Q7+Q9+ Q11+(5-Q4)] \times 2$ Potential score of 48 represents “strongly agree” that job offers opportunities for using and developing new skills
Decision Authority	JCQ	6, 8, 10	Likert 1-4	$[Q6+Q8+Q7+Q10] \times 4$ Potential score of 48 represents “strongly agree” that job offers opportunities to make independent decisions regarding one’s job
Supervisor Support	JCQ	14, 15, 17, 18	Likert 1-4	$Q14+Q15+Q17+Q18$ Potential score of 16 represents “strongly agree” that job provides support from supervisor
Coworker Support	JCQ	19, 20, 22, 24	Likert 1-4	$Q19+Q20+Q22+Q24$ Potential score of 16 represents “strongly agree” that job provides support from coworkers
Personal Control	Mirowsky-Ross 2X2 Index of Sense of Control	1 - 8	Likert 1-4	Sum of Q1- Q8 Potential score of 32 indicates a perception of having a strong sense of control over life.
Emotional Support	MacArthur Emotional Support scale	1 - 6	Likert- like 1-4	Mean of Q1-Q6 Potential score of 4 indicates a perception of have emotional support from friends, family, children
Generativity	Loyola Generativity	1 - 6	Likert- like 1-4	Sum of Q1-Q6 Potential score of 24 indicates Having a high perception of generativity
Social Network	MacArthur Social Network scale	1-3	interval	Sum of close relationships with children, friends/spouse and group participation

For the Mirowsky-Ross 2 X 2 Index of Sense of Control, the responses were also scored along the same 4-point Likert Scale: *strongly disagree* (1), *disagree* (2), *agree* (3), and *strongly agree* (4). Scores were summed to obtain a potential scale score of up to 32 representing a high degree of personal control over life (see chapter 3 for details about reverse scoring for questions 5-8).

The Emotional Support scale is a six question scale scored according to a 4-point ordinal scale: *never* (1), *rarely* (2), *sometimes* (3), and *frequently* (4). The summary measure of the Emotional Support scale reflects the average reported frequency of emotional support across the 6 individual questions with a potential high score of 4.

The Loyola Generativity Scale measured two dimensions of generativity relative to the workplace: passing skills on to younger generations and being creative and productive. The scale consists of 6 questions rated on a 4-point scale that reflects the frequency of expressing commitment related to the statement: the item *never applies* (1), *occasionally or seldom applies* (2), *applies fairly often* (3), and *applies very often* (4). The values for individual questions were summed to create an overall potential generativity score of 24 for the study (McAdams, personal communication, September 20, 2008).

The summary measure of Social Networks reflected the number of close relationships with children, combined friends and relatives, spouse, and group participation. The number was summed and recorded as an interval measurement (Seeman, et al., 2001).

Scores were reported in text as the values obtained by the standardized scoring. However, the mean values of the ordinal-level questions were calculated for each scale (and reported in Table 6) in order to facilitate comparison among scales.

Descriptions of Job Design Characteristics

The JCQ measured the following job design characteristics: skill discretion, decision authority, supervisor support, and coworker support. Older workers' perceived abilities to communicate knowledge to coworkers and customers were added to these job design characteristics in order to answer the research questions. The mean scores (see Table 6), interpretations, and initial implications for the results are presented.

Skill Discretion

The variable of *skill discretion* addressed respondents' perceptions of using a variety of skills at work, needing a high skill level to perform the job, and developing special skills through work. The calculated score for this section was 34.89 (range 26.00 - 44.00, $SD = 4.35$) representing general agreement that the job tasks provided opportunities to use and develop a variety of skills (a mean score of 2.91 / 4 for each question). This score is higher than 31.5 ($SD = 7.36$) the normative score for skill discretion in this occupational category (Karasek, 1986) (Cohen's d effect size of .562). Histograms showed a symmetrical distribution of scores about the mean of 34.89.

Table 6

Descriptive Statistics for Variables under Study

Variable	<i>n</i>	Minimum	Maximum	Mean	<i>SD</i>	Mean per question on 4-pt scale
SkillDisForm	109	26.00	44.00	34.89	4.35	2.91
DecAuthForm	109	24.00	48.00	34.53	6.68	2.87
CoSupForm	109	8.00	16.00	12.37	1.55	3.08
SuSupForm	96	4.00	16.00	12.35	2.18	3.09
SocNetScForm	106	1.00	54.00	14.92	8.67	-
EmotSupForm	108	1.50	4.00	3.59	.51	3.60
PerSensContForm	108	18.00	32.00	24.74	2.89	3.09
LoyGenForm	109	8.00	24.00	18.48	3.55	3.07

Note. Variable codes for job design variables are as follows: Skill Discretion (SkillDisForm), Decision Authority (DecAuthForm), Coworker Support (CoSupForm), and Supervisor Support (SuSupForm); codes for successful aging variables are Social Network (SocNetScForm) Emotional Support (EmotSupForm), Personal Sense of Control (PerSensConForm), and Generativity (LoyGenForm).

When the frequencies for the responses agree and strongly agree were combined for reporting, respondents agreed to strongly agreed that the job required them to learn new things (97.3%, $n = 106$), perform a variety of tasks (92.7%, $n = 101$), be creative in their jobs (82.6%, $n = 90$), and use a high level of skill (71.6%, $n = 78$). However, respondents perceived the job to be repetitive (89%, $n = 97$); a response which is

consistent with job descriptions describing the performance of routine job tasks such as selling items, interacting with customers in similar ways, and completing the same routine of work processes.

These results suggest that a sales job in home building industry does have standard procedures and routine tasks associated with customer service and maintenance of inventory that were perceived as repetitive. However, in the overall perception of skill discretion, opportunities for learning and using skills may outweigh the negative aspects of job repetition in older workers as evident in their score that is higher than national norms for workers in retail sales jobs (Karasek, 1986).

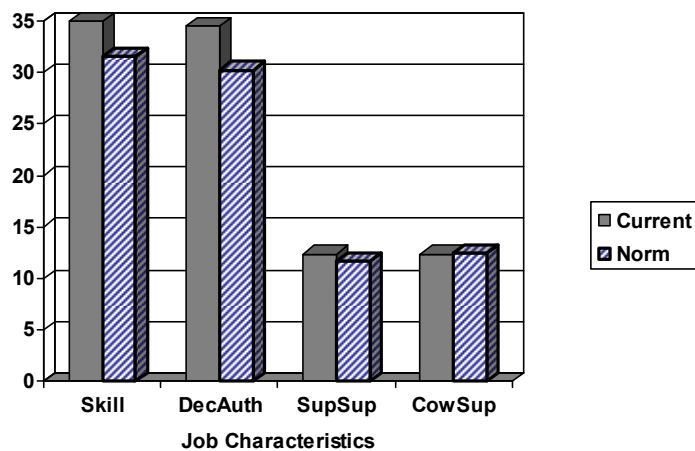


Figure 2. Comparison between workplace job design scores for this sample of older workers and a normative sample in the retail sales industry (Karasek, 1986).

Decision Authority

The variable of decision authority assessed respondents' perceptions of their abilities to make independent decisions related to their jobs. The mean calculated score for this section was 34.53 (median, 36.00; range 24.00 - 48.00; $SD = 6.68$) indicating that older workers agreed that opportunities to make decisions existed in their jobs (mean score of 2.87 / 4 for each question). This score was higher than the standardized JCQ norms for this occupational category, 30.2 ($SD = 7.26$, Cohen's d effect size = .62) indicating that older workers in this sample perceived having more control than other workers in retail sales jobs (Karasek, 1986).

Histograms showed a distribution of responses about a mean of 34.53 with a slight positive or right skew (skewness = .273). Respondents agreed to strongly agreed with statements that they could make their own decisions (79.87%, $n = 87$) and disagreed that they had little freedom in making their own decisions (76.2%, $n = 83$).

There was less consistency in older workers' perceptions that they contributed significantly to workplace decisions. Almost 57% agreed to strongly agreed they "had a lot of say" in their jobs, leaving 43% to indicate that they "did not have a lot of say".

These responses reflect the reality of a sales associate job position in which workers in entry level positions work within already established procedures. Informal feedback from older workers indicated that they felt constrained by the standard operating procedures and computerized processes that were integral to system. However, they exercised creativity and decisional latitude in interactions with customers. It appeared that older adults feel limited in opportunities to contribute to broad store-wide

decision processes but are able to make independent decisions relative to educating and helping customers. Such opportunities may explain why decision authority scores for these older sales associates in the home building industry are higher than national norms.

Supervisor Support

The variable of supervisor support refers to the degree to which older workers feel that their supervisors are concerned about them, heed what they say, are organized, and promote an efficient, team-oriented, work environment. Although an inclusion criteria was that participants were employed (and it was assumed all respondents would have a supervisor), some older workers did not perceive themselves having a supervisor. Thus, the sample size for the questions related to this variable ranged from $n = 96$ to $n = 99$. The overall score for this section was 12.35 (range 4.00 - 16.00; $SD = 2.18$), which is higher and with less variance than the JCQ standardized norms for retail sales associates, 11.65 ($SD = 5.82$). The effect size is .18 for differences between scores in this study and the normative sample (Karasek, 1986). The score indicates that older workers agree they have support from supervisors (mean score for each question is 3.08 / 4.00). The histograms revealed an atypical distribution of data with a negative or left skew (-.734) and kurtosis of 1.76 (around a data point value of 12.00).

When the frequencies for the responses agree and strongly agree were combined, older workers agreed that supervisors were helpful in getting the job done (91.9%, $n = 90 / 98$), concerned about them (87.6%, $n = 85 / 97$), paid attention to what they were saying (85.5%, $n = 83 / 97$), and organized (82.8%, $n = 82 / 99$). These results suggest a high

degree of agreement by older workers that supervisors create supportive and helpful environments and express concern for older adults' well being. They provide support for older adults relative to creating work environments in which older adults can accomplish work-related tasks. These scores are higher than national norms which may reflect intergenerational respect for older workers, more years working in which to establish supervisory relationships, differences in types of sales organizations, or perhaps qualitative differences in supervisory relationships in the home building industry itself.

Coworker Support

The variable of coworker support refers to the degree to which older workers felt their coworkers were caring, respectful, and helpful in getting the job done. The overall score for this section was 12.37 (range 8.00 - 16.00; $SD = 1.55$), indicating that older workers agreed they receive support and assistance from coworkers (mean score of 3.09 / 4.00 for each question). This score is similar to (slightly lower) the national JCQ norm of 12.46 ($SD = 2.86$). The Cohen's d effect size is .04, showing little difference between the study and normative sample scores. The distribution for coworker support was symmetrical about the mean of 12.37.

When the frequencies for the responses agree and strongly agree were combined, respondents perceived coworkers to be friendly (97.3%, $n = 106$), found coworkers to be helpful (95.4%, $n = 104$) and concerned about them (88.1%, $n = 96$), felt their coworkers worked together as a team (86.2%, $n = 94$), and felt coworkers were interested in what they had to say (84.4%, $n = 92$). The extent to which other coworkers listened to them

was slightly less. These results indicate that older workers felt supported by their coworkers to a similar degree as other workers in national samples (Karasek, 1986).

Job Characteristics and Organizational Structure

The total sample of older workers was grouped into two employment categories, working in independently owned stores versus working in corporate owned home building stores, in order to compare job characteristic according to the organizational structure. Independent samples t test and nonparametric Mann-Whitney tests were used to examine the differences in skill discretion, decision latitude, and supervisor and coworker support scales between the two categories of workers.

There was no significant difference in the mean scores for decision authority ($t = -.514$, $df(107)$, $p = .608$) or coworker support ($t = 1.250$, $df(107)$, $p = .214$) between the two organizational groups based on an independent samples t test. However, the differences in scores for the supervisor support and skill discretion subscales of the JCQ were significant when compared against organizational structures. Supervisor support was significantly higher in independently owned stores as compared to corporate home building stores. The Mann Whitney U test was used to examine differences among the medians of the two groups since the distribution of data for supervisor support was atypical (independently owned: rank 58.38; corporation: rank 43.51; $Z = -2.468$, $p = .014$). The mean scores for skill discretion were significantly higher in corporate owned stores as compared to independently owned stores (independently owned: mean = 34.28, $SD = 4.14$; corporation: mean = 36.00; $SD = 4.54$; $t(107) = -1.999$, $p = .048$). The effect

size (Cohen's $d = .40$) was small to medium (Cohen, 1988) and power was low (.63) possibly indicating that a higher n for corporate stores may have improved the ability to detect a difference in scores (see Figure 3).

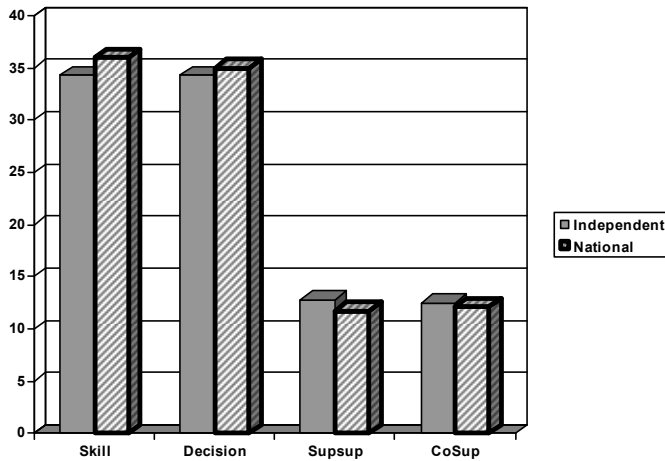


Figure 3. Differences between skill discretion and supervisor support are significantly different in national corporations versus independently owned stores.

The results of comparing job characteristics in corporate versus independently owned stores may indicate that while the job of a sales associate may have similar job descriptions across industries, the differences in management structure and design of the job between two types of organizational structure may influence the work experiences for older adults. Higher levels of support from supervisors in independently owned stores may indicate a closer relationship with supervisors in smaller stores. However, the higher perceived level of skills necessary for the job in corporate owned stores may suggest that older workers view themselves as the experts and are often on their own when advising

or educating customers. Thus, older workers may perceive themselves as establishing more a specialty niche and using a variety of skills in corporate owned stores.

The difference in older workers' perceptions of skill level needed for the job may also reflect the type of worker attracted to the type of home building store. For example, more highly educated workers (who may *not* perceive a high skill requirement for a sales associate job) may be attracted to working in smaller, independently owned stores. In this study, of those were most highly educated (who had taken post-graduate courses) 89% (8 / 9) worked in independently owned stores, and 11% (1 / 9) worked in corporate stores.

To summarize, the job characteristics scores for this sample were higher than the normative scores (medium effect size) for skill discretion and decision authority. Older workers agreed that the job position of a sales associate in the home building industry was characterized by opportunities to make independent decisions, use of a variety of skills, and gain social support from supervisors and coworkers. Older workers indicated that the job demanded procedural repetition in enacting the customer service and inventory management. However, they also agreed that they were able to learn, use, and develop skills through their jobs.

Older workers further responded that they had supervisor and coworker support at work. Scores for supervisor support were slightly higher than normative scores (showing only a small effect size difference). Scores for coworker support were slightly below normative samples but differences were not significant. Older workers in independently owned stores reported higher levels of supervisor support than those in corporate stores which may suggest closer working relationships in smaller stores. Older workers in

corporate owned stores reported higher levels of skill discretion indicating that they perceived themselves working more independently and using a higher skill level than older workers in independently owned stores. The next section addresses the levels of successful aging variables found in this study.

Descriptions of Successful Aging Variables

Social Network Scale

The Social Network scale measured the number of older workers' close social contacts. (Chapter 3 describes the numerical interpretations for qualitative responses.) The mean score for the Social Network scale was 14.92 (range 1.00-54.00; $SD = 8.67$) representing the sum of close children, friends or relatives, spouse, and group participation. The data was not normally distributed, displaying a right skew of 2.038 and kurtosis of 6.84. The values were clustered at the lower end of the range and the frequency of responses fell sharply about the mean.

Older workers in the sample had a mean of 2.19 children (range = 0-9, $SD = 1.47$) and a median of 10.50 friends and relatives (range = 0-50, mean = 11.44, $SD = 8.78$) with whom they felt close. In this case, the median best represents the central tendency given the inclusion of two extreme values (of 50) for the number of close friends. This total number of close ties with friends and relatives in the sample approximates the results of the MacArthur studies (10.6 [$SD = 5.4$] for men and 9.7 [$SD = 5.0$] for women) (Seeman et al., 2001). Older men had more close ties in this study as compared to older men in the MacArthur studies (Cohen's $d = .14$).

The group participation responses indicated that the majority of the sample (61.7%, $n = 66 / 107$) did not participate regularly in group activities (defined as participating at least once a month). The participation in group activities (107 responses) was reported as: less than once a month, 43.9% (47); once per month, 17.4% (19), once per week, 28.4% (31); 2 - 3 times per week, 7.5% (8), and daily, 1.9% (2). These results represent lower group participation than older adults in the MacArthur study in which each person participated a mean of 1.3 groups per month (Seeman et al., 2001).

No significant differences existed between older male and older female workers for responses related to the number of close ties with children and participation in group activities. However, older males in the sample reported having significantly more close friends and relatives than older women (male: $M = 12.01$, $SD = 8.62$; female: $M = 8.81$, $SD = 4.69$, $t(89) = 1.76$, $p = .03$, Cohen's d effect size = .46, power = .57) which is consistent with MacArthur study outcomes. There was a significant positive correlation between the number of years older adults had worked and their social network size ($r = .224$, $p = .021$). This may suggest that the longer older adults remain in the workforce, the greater potential that coworkers are considered to be close friends.

Overall, these results suggest that the sample of older workers had a social network size that was comparable to highly functioning older adults in the MacArthur studies (Seeman et al., 2001) indicating well developed social networks. Older men reported a significantly higher number of social ties than older women with a moderate effect size (despite low power due to a small sample size for women).

Emotional Support Scale

The Emotional Support scale measured the emotional support that older workers experienced from spouses, children, and friends (see Table 7). The frequencies of feeling loved (or cared for) and listened to were measured for each of the three categories of social ties: spouses, children, and friends. The emotional support was calculated as the average reported frequency across reported social ties (Seeman et al., 2001) which enabled reporting mean scores for older workers' emotional support despite differing social circumstances (i.e., single or having no children).

The mean score for the Emotional Support scale was 3.60 (range = 1.5 - 4.00; *SD* = .51). The scores for this sample of older workers were higher than those reported for high functioning older adults in the MacArthur studies (2.4 [*SD* = .6] for men and 2.5 [*SD* = .5] for women) (Seeman et al., 2001). The distribution of the data was not normal showing a left skew of -1.638 (indicating scores that scored clustered around the high end of the range, 3.5 - 4.0) and a kurtosis of 2.99, indicating a sharp decline in values about the mean.

Responses to specific questions relative to the frequency of feeling loved (or cared for) by spouses indicated that 76.1% ($n = 67 / 88$) of the sample frequently felt loved and listened to by spouses (see Table 7 for specific responses). Over three quarters of the sample frequently felt loved or cared for by their children (78.6%, $n = 77 / 98$); however fewer respondents felt that children listened to them frequently (59.4%, $n = 57 / 98$).

Table 7

Emotional Support Scale Frequency Data

Emotional support item	Frequency of response	(%)	Responses / total sample
Feel loved or cared for by spouse	Frequently	76.1	67 / 88
	Sometimes	19.3	17 / 88
	Rarely	2.3	2 / 88
	Never	2.3	2 / 88
Feel listened to by spouse	Frequently	76.1	67 / 88
	Sometimes	20.5	18 / 88
	Rarely	1.1	1 / 88
	Never	2.3	2 / 88
Feel loved or cared for by children	Frequently	78.6	77 / 98
	Sometimes	13.3	13 / 98
	Rarely	6.1	6 / 98
	Never	2.0	2 / 98
Feel listened to by children	Frequently	59.4	57 / 96
	Sometimes	28.1	27 / 96
	Rarely	6.2	6 / 96
	Never	6.2	6 / 96
Feel loved or cared for by friends	Frequently	70.1	75 / 107
	Sometimes	24.3	26 / 107
	Rarely	3.7	4 / 107
	Never	1.9	2 / 107
Feel listened to by friends	Frequently	59.6	62 / 104
	Sometimes	33.7	35 / 104
	Rarely	4.8	5 / 104
	Never	1.9	2 / 104

About 70% (75 / 107) of all respondents felt frequently loved or cared for by their friends although fewer respondents felt that friends frequently listened to them (59.6%, $n = 62 / 104$). Thus, close to three fourths of the sample indicated feeling loved by spouses, children, and family, but a lower percentage of older adults felt that children and friends listened to their problems.

A summary of responses for the Social Network and Emotional Support scales indicate that this sample of older workers appeared to have an adequate network of close social ties and feel emotional support in terms of feeling loved and cared for. Older workers in this sample experienced high levels of emotional support as compared to age-related samples in the MacArthur Study. Respondents indicated that children and friends were better at caring for them than listening to them. The sample was less likely to participate in regularly in group activities as compared to age-related samples in the MacArthur study (possibly due to participation in the labor force).

Personal Sense of Control Scale

The Mirowsky-Ross 2 X 2 Index of Sense of Control measured the concepts of having personal control over good and bad outcomes as well as denying control over good and bad outcomes. The mean score for this section was 24.74 (range 18.00-32.00; $SD = 2.89$); the mean score for each question was 3.09 / 4. The data was rescored using the same numerical values as Mirowsky and Ross (1991) (ranging from -2 = *strongly disagree* to +2 = *strongly agree*) in order to compare the scores from this sample of workers with previous studies. The average response to all scores was computed as an

index score. The rescored mean for this sample of older workers was .96 (range -.50 - 2.00; $SD = .48$).

This recoded score is higher than the reported mean in samples of college students ($M = .744$), community dwelling adults ($M = .663$) (Mirowsky & Ross, 1991), and a sample of 2,592 individuals ranging from ages 18 to 95 ($M = .669$) (Bird & Mirowsky, 1998). The standard deviations for scores were not provided in published research reports; therefore the effect size was not calculated for the magnitude of difference between means of published studies and scores from this sample of older workers. However, given that the mean score of .96 is two standard deviations above the norm ($.96 / .48$), this sample would be considered to have a positive sense of control over their lives and a higher sense of control than other age-related samples. The distribution of scores was close to normal (skewness = .391; kurtosis = -.075).

Table 8 presents the specific responses to questions. For questions agreeing with internal statements about having control, about 79% - 98 % of all participants agreed to strongly agreed with statements relative to claiming control for life successes, mistakes, and failures. For questions disagreeing with external statements related to lack of control, a smaller, but still high percentage (78% - 89%) strongly disagreed to disagreed (reverse scoring) with statements claiming *lack of control* over events happening to them. These results suggest that this group of older adults perceives themselves as having positive control over their lives. This positive sense of control reflects the high psychosocial functioning in this sample of older adults and may reflect their sense of having control

Table 8

Frequencies for Personal Sense of Control Scale

Sense of control question	Agree to strongly agree		Disagree to strongly disagree	
	%	<i>n</i>	%	<i>n</i>
1. I am responsible for my successes	98.1	107		
2. I can do what I set my mind to	91.8	100		
3. Misfortunes are the result of my mistakes	78.9	86		
4. I am responsible for my failures	89.0	97		
5. Good things that happen are mostly luck			89.8	97
6. There is no sense in planning			84.3	91
7. My problems are due to bad breaks			85.1	92
8. I have little control over bad things that happen to me			77.7	84

Note. The total *n* for the sample is 109. Questions 1-4 refer to claiming (internal) control over good and bad outcomes; questions 5-8 refer to denying (external) control over good and bad outcomes.

Generativity

The LGS assessed the frequency with which older workers agreed with statements regarding two aspects of generative behaviors: passing along knowledge to younger generations and being creative and productive. A summative score for the LGS was derived from the average scores of questions related to passing along wisdom to others and creativity / productivity. Chapter 3 describes interpretation of qualitative responses (yes or no) for requested numeric scores.

The overall summative score for this section was 18.47 (range 8.00 - 24.00; $SD = 3.55$). The mean score for each question was 3.07/ 4.00. The histograms indicated a curvilinear distribution with a left skew (responses distributed more toward the upper end of the scale) (-0.355) and kurtosis (-0.501). These results indicate that older workers in this sample do perceive they have opportunities to enact generativity in their lives. When responses of fairly often and very often were combined, 94.5% (100) of all respondents felt that they passed knowledge on to younger generations fairly or very often; 88% (96) reported that others come to them for advice; and 76.2% (93) felt that they taught skills to younger generations fairly or very often. Only 40.3% (44) indicated that they would like the job of a teacher.

The generative behaviors of being creative and productive were also reflected in older workers' responses to being creative and productive fairly often to very often: 85.3% (93) of all respondents indicated they were considered productive by others and 84.4% (92) of the sample responded that they used creativity in their daily tasks. The variables related to passing along information to customers and coworkers indicated that

older workers agreed to strongly agreed that they passed along knowledge to coworkers (97.2%, $n = 106$) and customers (99.1%, $n = 108$) during their daily job tasks.

Comparison of these results with other studies is difficult because 1) normative population scores do not exist for this test; and, 2) previous research studies combine other measures of generativity into one score. However, contact with author Dan McAdams (personal communication, September 15, 2008) indicated that typical older adults score an average of 3.0 for each question. For this sample, the mean of each question was above a score of 3.0 except for a question referring to one's desire to be a teacher.

In summary, measures of successful aging indicate that this sample appears to be a highly functioning group of older adults with well developed social networks and emotional support, higher than high functioning older adults in the MacArthur Study of successful aging. Scores for personal sense of control are also higher than norms for community-based studies of older adults. Generativity scale scores are considered similar to other age-related samples. The next section presents the relationships among sets of variables and presents the ability of job design variables at predicting successful aging outcomes.

Relationships among Job Design and Successful Aging Variables

Use of Scatter Plots to Initially Examine Relationships

In order to examine relationships among the job design and successful aging variables, scatter plots were initially performed to examine the distribution of data points, linearity, and homoscedasticity (Pallant, 2005). Each dependent variable (personal

control, generativity, social network, and emotional support) was plotted against each job design variable (skill discretion, decision authority, coworker support, and supervisor support) and examined for the nature of the relationship between variables in a univariate manner.

There appeared to be no particular cluster or linearity to the distribution of data points when the successful aging variable of emotional support (DV) was plotted against any of the four job design variables (IV) (skill discretion, decision authority, coworker support, supervisor Support). Similarly, the scatter plots showed no clear relationship between data points for social network (DV) and any of the four job design variables (IV). When personal control (DV) was plotted against the job design variables of skill discretion (IV) and coworker support (IV), there was an upward trend to the data points suggesting a weak, positive, linear relationship. Scatter plots showed a weak to moderate, positive, linear relationship between generativity and decision authority, coworker support, and skill discretion.

Bivariate Statistics to Examine Relationships

In order to examine the strength of the linear relationships, a Pearson product-moment correlation was performed for each of the identified relationships. As reflected in the correlation matrix in Table 9, no significant associations existed between the successful aging variable of social network and job design variables; small associations existed between emotional support and the job design variables of decision authority, skill variety, and coworker support.

Small to medium positive correlations existed between the successful aging variable of personal sense of control and job design variables. Personal sense of control and skill discretion were minimally related ($r = .257, p = .007$) and personal sense of control and coworker support were moderately related ($r = .339, p = .000$). Generativity was positively correlated with skill discretion ($r = .438, p = .000$), decision authority ($r = .276, p = .002$), and coworker support ($r = .219, p = .011$). The strength of the associations and related effect sizes were small to medium based on Cohen's (1988) classification of small ($r = .10 - .29$) and medium ($r = .30 - .49$). (See Table 9 for complete data, rounded to two decimals).

These correlation coefficients suggest that, in this study, there was a very small relationship between how the job was designed (opportunities to use skills, make decisions, experience support of coworkers and supervisors) and older adults' reported social networks (number of close contacts) or emotional support system. These results may suggest that work relationships developed by older workers in the home building industry may not be strong enough to be considered close personal friends upon whom older workers rely for emotional support. Thus, the workplace may not play a strong role in providing older adults with the intimate type of social support considered important for emotional security.

Table 9

Correlation Matrix for Pearson Product-Moment Correlations for Job Design and Successful Aging Variables

Variable	1	2	3	4	5	6	7	8
1. SkillDisForm	1	.57**	.22*	.26**	-.13	.19	.26**	.44**
2. DecAuthForm		1	.26**	.33**	-.08	.20*	.13	.28**
3. CoSupForm			1	.41**	.07	.19	.34**	.22*
4. SuSupForm				1	-.09	.02	.15	.03
5. SocNetScForm					1	.27**	-.08	.14
6. EmotSupForm						1	.23*	.35**
7. PerSensContForm							1	.32**
8. LoyGenForm								1

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

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

However, relationships between personal sense of control, coworker support, and skill discretion suggest that, although coworker support may not be associated with close personal ties, coworker support may offer the assistance and camaraderie necessary to enable older workers to feel that they can effectively control their environments and overall lives. The successful aging variable of generativity was positively associated with skill discretion, decision authority, and coworker support suggesting that jobs designed with opportunities to develop and use a variety of skills (skill discretion), work

collaboratively with coworkers (coworker support), and make decisions independently (decision authority) also provided them with the knowledge and opportunities to pass along knowledge to younger generations. This information suggests that a positive work environment may also promote generativity for older workers.

Variance in Successful Aging Variables as Predicted by Job Design Characteristics

A standard multiple regression (MR) equation was performed for each of the four successful aging dependent variables (personal control, generativity, social network, and emotional support) in order to determine the degree to which job design characteristics contribute to successful aging outcomes. All four job design variables (skill discretion, decision authority, coworker support, supervisor support) were regressed on each of the four successful aging dependent variables in a standard MR. In a standard MR all IV are entered into the equation at the same time and given the same priority. The results for each MR are presented for each successful aging variable (the dependent variable). The following analysis includes a review of the correlation analysis, tests for multicollinearity, the regression equation, and a review of normalcy of residuals.

Successful Aging Outcome: Generativity

Correlations. In order to determine the associations between job design variables and the successful aging outcome of generativity, the results of the Pearson product-moment correlations were reviewed. Correlational analysis indicated a small to moderate association between generativity and skill discretion ($r = .438, p = .000$), decision authority ($r = .276, p = .004$), and coworker support ($r = .219, p = .022$) as indicated in

Table 10. Only correlations above .3 are considered to be strong enough to be predictive in an MR equation (Tabanacik & Fidell, 1996); therefore, only skill discretion would be expected to contribute significantly to generativity outcomes.

Table 10

Correlations between Loyola Generativity Scale and Job Design Variables

Variable	LoyGenForm	
	<i>r</i>	<i>p</i> value
SkillDisForm	.438*	.000
DecAuthForm	.276*	.004
CoSupForm	.219*	.022
SuSupForm	.003	.975

Note. Sample size is $n = 109$, except for supervisor support, $n = 96$.

Variable codes refer to following: SkillDisForm = Skill Discretion; DecAuthForm = Decision Authority; CoSupForm = Coworker Support; SuSupForm = Supervisor Support. Statistical significance is denoted by *.

Assumptions of normalcy. Checks for normalcy were performed before conducting the final MR equation. A check for multicollinearity ensures that two variables are not so closely related that the impact of each individual variable can not be discriminated. It is suggested that variables correlated at $r = \geq .7$ (Tabancik & Fidell, 1996) or $r = \geq .8$ (Katz, 2006) should be removed or combined to create new variables.

In this study, no variables were so highly correlated to suggest multicollinearity please refer to Table 10).

Standard multiple regression equation. A standard MR equation was used to examine the contribution of the combined job design variables at predicting successful aging outcomes collectively as well as the contribution of each variable to the successful aging outcome of generativity. The standardized and unstandardized correlation coefficients, the constant value (y intercept), and the variance in generativity scores that can be explained by the combined job design variables (R^2) are presented.

The multiple regression resulted in a moderate correlation (and effect size) of $r = .479$ between the combined job design variables (skill discretion, decision authority, supervisor support, coworker support) and the outcome variable of generativity (see Table 11).

Table 11

Model Summary for Multiple Regression Equation for Generativity

R	R^2	Adjusted R^2	Std error of the estimate
.479	.230	.196	3.19

Note. Predictor variables: skill discretion, decision authority, coworker support, supervisor support.

The total combination of job design variables explained 23% of the total variance in generativity scores ($R^2 = .23$). This represents an effect size of .30 (power = .99) suggesting that all the variables collectively have a large effect or impact on the variance in the generativity scores. However, it does not indicate which job design variable is the greatest contributor.

Analysis of variance (ANOVA) was used in this multivariate analysis as a check to examine the significance of the overall model (see Table 12). The F test compares the differences in mean values of DV and the IVs (collectively) to determine the success of the independent variables at predicting a better “fit” or prediction of the outcomes than would be expected by chance. If mean values of all IVs are not significantly different then the DV, then the IV in the regression equation cannot account for any variation or prediction in the DV (Katz, 2006; Pallant, 2006).

Table 12

ANOVA for Multiple Regression Model for Generativity

	Sum of squares	df	Mean square	F	Significance
Regression	275.70	4	68.93	6.78	.000
Residual	925.17	91	10.17		
Total	1200.86	95			

Note. Predictors are skill discretion, decision authority, coworker support, and supervisor support.

Table 12 shows that the independent variables collectively explain a significant portion of the outcome. However, the high residuals indicate that this model explains only a portion of the variance in generativity and that other factors also contribute to the overall variance.

The correlation coefficients in the multiple regression equation are represented in Table 13. The standardized beta coefficient (β) indicates the contribution of each job design IV to the overall variance of the DV. The standardized beta coefficient is a normalized z score that is used to compare all coefficients that may have different metrics or raw scores (although all job design variables were scored on similar Likert scales). The p value assigned to each beta coefficient indicates the significance of that IV contribution to the total variance.

Table 13

Correlation Coefficients in the Multiple Regression Equation for Generativity

Variable	B	SE B	β	t	Sig	Correlations	
						Partial	Part
Constant	3.95	3.40		1.16	.25		
SkillDisForm	.34	.09	.41	3.67	.00*	.36	.34
DecAuthForm	.03	.06	.05	.42	.68	.04	.04
CoSupForm	.42	.23	.18	1.81	.07	.19	.17
SuSupForm	-.28	.17	-.17	-1.62	.11	-.17	-.15

Note. Variable codes are as follows: SkillDisForm = skill discretion; DecAuthForm =

decision authority; CoSupForm = coworker support; SuSuForm = supervisor support.

Statistical significance denoted by *.

For the outcome variable of generativity, only skill discretion (SkillDecForm) ($\beta = .414$, $p = .000$) was found to be a significant contributor in the regression equation. The B weight ($B = .338$) represents the unstandardized correlation coefficient which is used in the multiple regression equation. B weights and p values for the non-significant variables are also found in Table 13.

Partial correlations. Partial correlation is the correlation of the independent variable (skill discretion) and dependent (generativity) variable after controlling (or removing) the influence of the other job design variables in both the DV and the IV. In partial correlation, other control variables are controlled in both the DV and IV, so that partial correlation becomes the correlation of the unique remaining values in the IV variable of skill discretion and DV of generativity. In this case, even after controlling for the influence of the other three job design variables, the correlation between Generativity and Skill Discretion is .359.

Part correlations. The part correlation indicates how much variation in the DV can be uniquely contributed by individual variables after controlling for the influence of other independent variables (although there may be still overlapping contributions of variables that cannot be uniquely assigned to one variable) in only the IV. In part correlation the common variance of the IV are removed from only the independent variable and then correlated with the dependent variable (DV).

In order to obtain the specific contribution of skill discretion to the DV of generativity, the part correlation (.338) is squared to obtain the value .151 (Pallant, 2006). This squared value indicates that skill discretion uniquely explains 15.1% of the variance in generativity. The overlapping values are not represented in the R^2 square value of .230 therefore all the squared part correlations do not add up to .230.

The general MR equation used for the study was:

$$y = a + b_1x_1 + b_2x_2 + b_3x_3 + b_4x_4$$

For the outcome variable of Generativity, the MR equation was:

$$\begin{aligned} \text{LoyGenForm} = & 3.953 + .34 (\text{SkilDesForm}) + .42 (\text{CoSupForm}) + .03 (\text{DecAuthForm}) \\ & + -.28 (\text{SuSupForm}) \end{aligned}$$

An analysis of residuals was conducted in order to determine the deviation of the actual data from the least squares or best-fit line of regression as found in the regression equation. The residuals plot would demonstrate the deviation from the expected scores and the observed (or calculated) scores that were really obtained. The normal probability plot shows little deviation from the expected regression. When the residuals were checked for scatter, the data is concentrated between -1 and 1.

This regression equation indicates that all job design variables collectively contribute 23% to the variance in generativity. However, the only significant contributor is skill discretion when all IV are entered into the equation at the same time; all other variables contribute nonsignificant amounts to the regression equation and overall

variance. The B weights indicate that a one unit change in skill discretion will result in a .34 unit change in generativity.

The data suggests that job design characteristics explained 23% of the variance in all factors that impact an older worker's perception of generativity in the workplace. This is considered to be a large effect in the overall variance in generativity. This outcome supports the alternative hypothesis that a weighted combination of variables predicted a portion of generativity outcomes. It suggests that, for this sample of older workers, a job design that provided opportunities to use of a variety of skills contributed to older workers' abilities to pass along information to younger generations. Thus, workplaces that provide ongoing retraining to update older workers' knowledge and opportunities to engage wide variety of skills (including knowledge-based, problem-solving, and organizational skills) can be seen as vehicles to promote generativity for older workers in their later years. Although the correlation coefficients for decision authority were nonsignificant in the multiple regression equation, Pearson product-moment correlations indicated that jobs in which older workers were able to make independent decisions and to work collaboratively with coworkers were associated with passing along information to younger generations. The successful aging variable of personal sense of control is discussed next.

Successful Aging Outcome: Personal Sense of Control

Correlations. In order to determine the associations between job design variables and the successful aging outcome of personal sense of control, the results of the Pearson

product-moment correlations were reviewed (see Table 14). The results indicated small to moderate associations (and effect sizes) between personal sense of control and coworker support and skill discretion.

Table 14

Correlations for Personal Sense of Control and Job Design Variables

Variable	PerSenseConForm	
	<i>r</i>	<i>p</i> value
SkillDisForm	.257*	.007
DecAuthForm	.128	.187
CoSupForm	.339*	.000
SuSupForm	.153	.138

Note. Sample size (n) = 108 except for Supervisor Support (n = 95).

Variable codes are as follows: SkillDisForm = skill discretion; DecAuthForm = decision authority; CoSupForm = coworker support; SuSuForm = supervisor support. Statistical significance denoted by *.

Standard multiple regression equation. The standard MR resulted in a moderate correlation of $r = .394$ between the combined job design variables (skill discretion, decision authority, supervisor support, and coworker support) and the outcome variable of personal sense of control (see Table 15). The total combination of job design variables explained 15.5% of the total variance in personal sense of control ($R^2 = .155$). This represents an effect size of .183 (power = .89) suggesting that all the variables

collectively have a small effect or impact on the variance in the personal sense of control scores.

Table 15

Model Summary for Multiple Regression Equation for Personal Sense of Control

<i>R</i>	<i>R</i> ²	Adjusted <i>R</i> ²	Std error of the estimate
.394	.155	.117	2.72

Note. Combined predictor variables: skill discretion, decision authority, coworker support, supervisor support.

The ANOVA statistic (see Table 16) showed a significant difference in the mean values of the dependent and independent variables so that the independent variables predict a significant portion of the variance in personal control ($p = .004$).

Table 16

ANOVA for Regression Equation for Personal Sense of Control

	Sum of squares	df	Mean square	F	Significance
Regression	121.85	4	30.46	4.128	.004
Residual	664.18	90	7.38		
Total	786.03	94			

Note. Predictors: Skill discretion, decision authority, coworker support, supervisor support.

The correlation coefficients in the MR equation are represented in Table 17. For the outcome variable of personal sense of control, coworker support ($\beta = .312, p = .005$) and skill discretion ($\beta = .239, p = .047$) were found to be significant contributors. The B weights are also provided. .

Table 17

Correlation Coefficients in the Multiple Regression Equation for Personal Sense of Control

Variable	B	SE B	β	t	Sig	Correlations	
						Partial	Part
Constant	13.42	2.91		4.60	.00		
SkillDesForm	.16	.08	.24	2.02	.047*	.21	.20
DecAuthForm	-.04	.05	-.08	-.71	.48	-.074	-.069
CoSupForm	.58	.20	.31	2.91	.005*	.29	.28
SuSupForm	-.01	.15	-.01	-.08	.93	-.01	-.01

Note. Sample size (n) = 108 except for Supervisor Support (n = 95).

Variable codes are as follows: SkillDisForm = skill discretion; DecAuthForm = decision authority; CoSupForm = coworker support; SuSuForm = supervisor support.

Statistical significance denoted by *.

Part correlations. Part correlations were squared to obtain the specific contribution of coworker support and skill discretion to the DV of personal sense of control. For coworker support, the part correlation (.281) was squared to obtain the value .079. This squared value indicates that coworker support uniquely explains 7.9% of the

total variance in personal sense of control. When the part correlation of .195 for skill discretion is squared, the value of .038 indicates that 3.8% of the variance in personal sense of control is uniquely offered by skill discretion.

Partial correlations. Partial correlation is the correlation of the independent (coworker support and skill discretion) and dependent (personal sense of control) variables after controlling for other job design variables in both the DV and the IV. In this case, even after controlling for the influence of the other job design variables, the correlation between coworker support and personal sense of control is still .293, and correlation between skill discretion and personal sense of control is .208.

The MR equation for the outcome variable of personal sense of control is:

$$\text{PerSenControl} = 13.42 + .58 (\text{CoSupForm}) + .16 (\text{SkillDecForm}) + -.04 (\text{DecAuthForm}) + -.01 (\text{SuSupForm}).$$

In an analysis of residuals, the normal probability lot showed little deviation of the observed data from this study with the expected regression; scores lie along a linear straight diagonal line. When the residuals are checked for scatter, the data was concentrated around 0 in both axes.

This regression model indicates that the job design characteristics collectively contribute 15.5% to the variance in personal sense of control scores for this sample of older workers, thus supporting the alternative hypothesis. The job design characteristics of coworker support and skill discretion contribute individually 7.9% and 3.8%

respectively to the overall scores, although overlapping data make it difficult to predict exactly these independent contributions. The regression equation indicates that for every one unit change in coworker support personal sense of control scores will increase .58; and, for every one unit change in skill discretion, personal sense of control scores will increase .16 units.

This data suggests that older worker participation in a work environment in which respect, support, and teamwork is fostered may contribute to older workers' sense of feeling control over their environments, and more broadly, their lives. The data further suggests that, to a lesser extent, developing and using special skills also contributes to older workers' sense they can control things that happen to them in life. Thus, workplaces that foster teamwork and skill development may also be contributing to older adults perceptions that they have control over their futures.

Successful Aging Outcome: Social Network

Correlations. Results of the Pearson product-moment correlation analysis showed only a very small relationship between social network and job design variables (see Table 9). Thus, one would not expect any significance for these variables in a regression equation.

Standard multiple regression equation. The standard MR resulted in nonsignificant contributions of job design characteristics to the variance in social network scores (correlation of $r = .195$ as indicated in Table 18). The total combination of job design variables explained 3.8% of the total variance in social network scores ($R^2 = .038$)

which is considered insignificant. This represents an effect size of .04 (power = .33) suggesting that all the variables collectively have very a small effect or impact on the variance in the social network scores.

Table 18

Model Summary for Multiple Regression Equation for Social Network

<i>R</i>	<i>R</i> ²	Adjusted <i>R</i> ²	Std error of the estimate
.195	.038	-.005	8.69

Note. Predictor variables: skill discretion, decision authority, coworker support, supervisor support.

The ANOVA statistic showed no significant difference in the mean values of the dependent and independent variables (see Table 19). The ANOVA table further identifies the high residuals which account for most of the variance in social network.

Table 19

ANOVA for Regression Equation for Social Network

	Sum of squares	df	Mean square	F	Significance
Regression	265.99	4	66.49	.88	.48
Residual	6722.47	89	75.53		
Total	6988.46	93			

Note. Predictor variables: skill discretion, decision authority, coworker support, supervisor support.

The correlation coefficients in the regression equation are represented in Table 20. No job design variables were significant contributors to the variance in social network.

Table 20

Correlation Coefficients in the Multiple Regression Equation for Social Network

Variable	B	SE B	β	<i>t</i>	Sig	Correlations Partial	Part
Constant	19.56	9.37		2.08	.04		
SkillDecForm	-.25	.25	-.12	-.97	.33	-.10	-.10
DecAuthForm	-.02	.17	-.01	-.11	.91	-.01	-.01
CoSupForm	.83	.65	.15	1.28	.20	.14	.13
SuSupForm	-.46	.47	-.12	-.97	.33	-.10	-.10

Note. Variable codes are as follows: SkillDisForm = skill discretion; DecAuthForm = decision authority; CoSupForm = coworker support; SuSuForm = supervisor support.

This MR analysis indicates that job design characteristics do not contribute significantly to the variance in social network scores for this sample of older workers; thus, the alternative hypothesis is not supported for this outcome variable. As suggested

by the data, the social support experienced in the workplace may not be considered to be intimate enough to be considered close social ties for this sample of older workers.

Successful Aging Outcome: Emotional Support

Correlations. A review of the Pearson product-moment correlation analysis showed small associations (and effect sizes) between emotional support and skill discretion, decision authority, and coworker support as indicated in Table 21. However, given these small associations, job design characteristics would not be expected to contribute significantly to the variance in emotional support in the MR equation.

Table 21

Correlations between Emotional Support and Job Design Variables

Variable	EmotSupForm	
	<i>r</i>	<i>p</i> value
SkillDisForm	.188	.052
DecAuthForm	.200*	.038
CoSupForm	.185	.055
SuSupForm	.024	.819

Note. Sample size (*n*) = 108 except for Supervisor Support (*n* = 95).

Variable codes are as follows: SkillDisForm = skill discretion; DecAuthForm = decision authority; CoSupForm = coworker support; SuSupForm = supervisor support. Statistical significance denoted by *.

Standard multiple regression equation. The standard MR resulted in nonsignificant contributions of job design characteristics to the variance in emotional support scores ($r = .276$). The total combination of job design variables explained 7.6% of the total variance in social network scores as shown in Table 22 ($R^2 = .076$). This represents an effect size of .08 (power = .62) suggesting that all the variables collectively have a small effect or impact on the variance in the emotional support scores.

Table 22

Model Summary for Multiple Regression Equation for Emotional Support

R	R^2	Adjusted R^2	Std error of the estimate
.276	.076	.035	.497

Note. Predictor variables: skill discretion, decision authority, coworker support, supervisor support.

The contribution of job design variables is considered insignificant according to the ANOVA statistic (see Table 23). The residuals far exceed the value of the regression. The correlation coefficients in the regression equation are represented in Table 23. No job design variables were significant contributors to the variance in emotional support.

The correlation coefficients in the multiple regression equation (represented in Table 24) indicate that no specific job design variables were significant contributors to the variance in emotional support. Overall, this multiple regression analysis indicates that job design characteristics contribute a small variance to emotional support scores for this sample of older workers.

Table 23

ANOVA for Multiple Regression Equation for Emotional Support

	Sum of Squares	df	Mean Square	F	Significance
Regression	1.84	4	.46	1.86	.125
Residual	22.24	90	.25		
Total	24.08	94			

Note. Predictor variables: skill discretion, decision authority, coworker support, supervisor support.

The variance in outcomes for emotional support was not significantly impacted by job design characteristics, and thus, the alternative hypothesis cannot be supported for emotional support through a predictive equation. However, collectively, all job design characteristics except for supervisor support showed small associations with the perception of emotional support in older workers' lives (as indicated in Table 9). As mentioned earlier, this data suggests that social networks and emotional support outcomes represent close personal relationships that may not be normally fostered through work in sales associates' jobs, in which varying work schedules, changes in daily job assignments, and a focus on the customer take precedence over developing close interpersonal work ties.

Table 24

Correlation Coefficients in the Multiple Regression Equation for Emotional Support

Variable	B	SE B	β	<i>t</i>	Sig	Correlations Partial	Part
Constant	2.46	.53		4.61	.00		
SkillDecForm	.01	.01	.10	.83	.41	.09	.08
DecAuthForm	.01	.01	.14	1.07	.29	.11	.11
CoSupForm	.06	.04	.18	1.57	.12	.16	.16
SuSupForm	-.03	.03	-.12	-1.05	.30	-.11	-.11

Note. Variable codes are as follows: SkillDecForm = skill discretion; DecAuthForm = decision authority; CoSupForm = coworker support; SuSuForm = supervisor support. Values are reported at two decimals unless further clarification is needed to show differences in values.

In summary, the MR equations indicated that two of the successful aging variables, personal sense of control and generativity, were impacted by job design variables by a medium to large extent. Thus, the alternative hypothesis is partially supported. Job design variables predicted 15.5% of the variance in personal sense of control and 23% of the variance in generativity scores in this sample of older workers. The following section discusses the contribution of specific job design variables to these outcomes.

Contribution of Specific Job design Variables in Predicting Successful Aging Outcomes

Collectively, all job design variables contributed to 23% of the variance in generativity and 15.5% of the variance in personal sense of control. When the specific job design characteristics were examined, the correlational analysis indicated that the job design characteristics of skill discretion, coworker support, and decision authority were associated with the successful outcomes measures of personal sense of control, generativity, and emotional support. In the regression analysis, skill discretion independently contributed 11.4% to the variance in generativity scores and 3.8% of the variance in personal sense of control. Coworker support contributed 7.8% to the variance in personal sense of control. Decision authority contributed nonsignificant amounts to the variance in generativity and emotional support.

Thus, the job design characteristics of skill discretion and coworker support had the greatest impact on the successful aging variables of generativity and personal sense of control. These results suggest that a management approach in which jobs are organized to promote use of a variety of skills and engagement in ongoing training may impact older workers' perceptions of having the knowledge and skills to pass along to younger generations. Further, jobs emphasizing skill variety may also influence the perception of controlling personal destiny for older workers. Finally, a job that is organized to encourage camaraderie amongst workers, team collaboration (coworker support), and mentoring, would appear to contribute to a sense of controlling an older worker's social environment and broader life. The following section briefly summarizes the statistical results followed by a narrative summary of the results.

Answers to Research Questions

1. What are the demographic characteristics of the sample of older workers?

- (a) *Mean age* was 64.03 years (range 55 - 81, *SD* 6.26)
- (b) *Gender distribution* was 82.6% (90) men and 17.4% (19) women
- (c) *Ethnic background* was White (98.2%, 107) and other 1.8% (2)
- (d) *Marital status* was primarily married (74.3%) or divorced (11.9%)
- (e) *Living situation* was primarily residing with their spouse (75%) or alone (11%)
- (f) *Health perception* was average, above average, or excellent for 93.5% (101)
- (g) *Educational attainment* was higher than national averages: 99.1% (108) completed high school; 62.4% (68) completed some college education
- (h) *Mean years of labor force participation* was 44.82; males had worked significantly longer years than females
- (i) *Previous work in related jobs*: 71% (76) had worked in previous jobs that were related to their current job position

2. What are the mean levels of job design characteristics and successful aging variables for this sample?

Job Characteristics (JCQ)

- (a) *Skill Discretion*: Score was 34.89 (Range 26 - 44, *SD* = 4.35) which is higher than 31.5 (*SD* = 7.36), the normative score for this occupational category.

- (b) *Decision Authority*: Score was 34.53 (Range 24 - 48; $SD = 6.68$) which is higher than 30.2 ($SD = 7.26$), the normative score for this occupational category.
- (c) *Supervisor Support*: Score was 12.35 (range 4 - 16; $SD = 2.18$) which is slightly higher than 11.65 ($SD = 5.82$), the normative score for this occupational category.
- (d) *Coworker Support*: Score was 12.37 (range 8 - 16; $SD = 1.55$) which is slightly lower than 12.46 ($SD = 2.86$), the normative score for this occupational category.

Successful Aging Scores

- (a) *Social Network scale* (MacArthur studies): Score was 14.92 (range 1.00 - 54.00; $SD = 8.67$), which approximates the mean of the MacArthur study (10.6)
- (b) *Emotional Support scale* (MacArthur studies): Score was 3.60 (range 1.5 - 4.00; $SD = .51$) which is higher than scores in the MacArthur studies (2.4 [$SD=.6$] for men and 2.5 [$SD .5$] for women).
- (c) *Personal Sense of Control* (Mirowsky- Ross 2 X 2 Index of Sense of Control Scale): Score was .96 (range -.50 - 2.00; $SD = .48$) which is higher than published means in community dwelling adults (.66).

- (d) *Generativity* (Loyola Generativity Scale): Score was 18.47 (range 8 - 24; $SD = 3.55$), which is comparable to “typical” older adults’ mean scores (McAdams, 2008).

3. What is the relationship between job design variables and successful aging variables in older sales associates in the home building industry?

- (a) Social Network and job design relationships were insignificant
- (b) Emotional Support (ES) was minimally associated with job design characteristics: ES and Skill Discretion, $r = .188$; ES and Decision Authority, $r = .200$; ES and Coworker Support, $r = .185$
- (c) Personal Sense of Control was significantly related to Coworker Support ($r = .339$) and Skill Discretion ($r = .257$) and nonsignificantly related to Decision Authority ($r = .128$).
- (d) Generativity was significantly related to Skill Discretion ($r = .438$), Decision Authority ($r = .276$), and Coworker Support ($r = .219$).

4. How much variance does each job design predictor variable (decision-making, skill variety, coworker support, and supervisor support) contribute to each successful aging variable (personal control, generativity, emotional support, social network) in older sales associates in the home building industry?

- (a) Job design variables contributed to 23% of the variance in Generativity (medium to large effect size); Skill Discretion independently contributed 11.4%.
- (b) Job design variables contributed to 15.5% of the variance in Personal Sense of Control (medium to large effect size). Coworker support independently contributed 7.8%; Skill Discretion independently contributed 3.8%.
- (c) Job design variables contributed to 7.6% of the variance in Emotional Support
- (d) Job design variables contributed to 3.8% of the variance in Social Network

5. Which job design predictor variables are the most important in predicting successful aging outcomes?

Skill Discretion and Coworker Support appear most important

- (a) Skill Discretion contributed to the variance in Generativity and Personal Sense of Control
- (b) Coworker Support contributed to the variance in Personal Sense of Control

Narrative Summary of Results

The research question for this study was how do job design variables (opportunities for decision-making, skill variety, coworker support, and supervisor support) influence successful aging (as measured by personal control, social network, and emotional support generativity) in employed older workers in the home building industry in Connecticut? In the study 115 older workers completed the surveys for a response rate

of 81%. The final sample was 109 after surveys were cleaned for missing inclusion criteria and missing data.

The sample was a homogenous group of primarily older White men who were married, in above average health, and who had received some college or technical education beyond high school. The majority of the sample had been working in a sales associate job for over five years that was related in some way to their previous job experiences. Over two-thirds of the sample had worked previously in job experiences related to the sales position. The sample appears to represent a typical older worker in the home building industry in Connecticut.

Measures of the job design characteristics indicated that the job position of a sales associate job in the home building industry was characterized by opportunities to make independent decisions, use of a variety of skills, and gain social support from supervisors and coworkers. The scores for this sample were higher than the normative scores for skill discretion, decision authority, and supervisor support; scores for coworker support were slightly below normative samples.

Successful aging outcomes indicated that this sample of older workers was a highly functioning group with a social network size and emotional support that was comparable to highly functioning older adults in the MacArthur studies (Seeman et al., 1993). The personal sense of control scores for this sample also indicated that these older adults had a strong sense of personal control as compared to other community-based studies. Generativity scores were reported as similar to other age-related samples (McAdams, personal communication, September 15, 2008).

When job design variables were regressed on successful aging outcomes independently, results yielded that job design variables collectively contributed 23% to the variance in generativity and 15.5% of the variance in personal sense of control. Generativity was positively associated with skill discretion suggesting that jobs designed with opportunities to develop and use a variety of skills contributed to their opportunities to pass along knowledge to younger generations. The job design characteristics of coworker support and skill discretion contributed to personal sense of control suggesting workplaces that foster teamwork and skill development may be contributing to older adults' perceptions that they have control over their social environments, and more broadly, over the life events that happen to them.

Job design characteristics did not contribute significantly to the variance in social network or emotional support scores for this sample of older workers. These results suggest that work relationships developed by older workers in the home building industry may not be strong enough to be considered close personal friends upon whom older workers rely upon for emotional support. Thus, the workplace may not play a strong role in providing older adults with the intimate type of social support considered important for emotional security. However, opportunities to develop skills and coworker relationships may be important for an older worker's sense of controlling one's environment and contributing to future generations, which *are* important aspects of successful aging.

CHAPTER 5:

SUMMARY, CONCLUSIONS, RECOMMENDATIONS

Introduction

The lifespan for adults in the United States has increased from age 62 in 1970 to age 76 in 2002 (U. S. Census Bureau, 2002). Accordingly, the psychosocial period designated as older adulthood has expanded well beyond retirement years leaving gerontologists to reexamine health and wellness in older age (Bonder & Wagner, 2001; Rowe & Kahn, 1998; Weiss & Bass, 2002). Rowe and Kahn equated successful aging with optimal physical, cognitive, and psychosocial functioning, a state that can be maintained through active engagement in life, such as work. Researchers are optimistic that older adults can sustain healthy, productive lives (Baltes & Baltes, 1990; Bonder & Wagner, 2001; Rowe & Kahn, 1998); however, the research suggesting that active engagement in life (work in particular) supports successful aging is just beginning to emerge.

The purpose of this study was to examine how work experiences may impact successful aging by focusing on the design of the job. This study was important because few social institutions promote wellness for older adults with a primary focus on successful aging (Rowe & Kahn, 1998). Institutions such as family and community agencies provide social networking, living assistance, and leisure activities. Medical services function primarily as tertiary intervention for health conditions. This study explored the extent to which the workplace may function as a naturally occurring social institution that promotes successful aging. The research question is relevant to the present

social context given that older adults are remaining in, and returning to, the workforce well past traditional retirement age.

Summary and Theoretical Constructs

Theoretical Constructs Explored

This study explored the relationship between two broad constructs: Rowe and Kahn's (1998) model of successful aging and Karasek and Theorell's (1990) DCM of healthy job design. Rowe and Kahn proposed that engagement in social and productive activities, such as work, promotes successful (or healthy) aging as measured by high physical and cognitive functioning and active engagement with life. However, no studies have specifically examined the type of work environments, job characteristics, or outcomes that support this proposition.

Karasek and Theorell (1990) proposed that jobs characterized by high levels of skill variety, decision-making, and social support would represent a healthy job design that supports physical and psychosocial health. This model of healthy work has been documented in numerous studies (please refer to chapter 2) but has not been related specifically to health and wellness for older adults relative to successful aging (Karasek & Theorell, 1996).

Thus, the research questions for this study examined the degree to which a healthy workplace (job design) could predict successful aging as measured by the following psychosocial outcomes: personal control, generativity, social network, and emotional support. The outcomes are important for both the health of older adults and the health of our social economy. This discussion will summarize the results of the study in relation to

the research questions, previous research, and the theoretical constructs presented in chapter 2. The conclusions that can be generalized to this sample of workers will then be presented followed by assertions about workplace design and work in general that will impact social change for older workers. Finally, the study limitations and recommendations for future research will be presented.

Summary of Results

This study answered the overall research question: how do job design variables (opportunities for decision-making, skill variety, coworker support, and supervisor support) influence successful aging (as measured by personal control, generativity, social network, and emotional support) in employed older workers in the home building industry in Connecticut? It was hypothesized that jobs designed to allow workers control over workplace decisions, use of a variety of skills, and opportunities to interact positively with coworkers and supervisors would contribute to psychosocial outcomes that have been associated with successful aging (having control over one's life, having a network of family and friends, feeling emotional support from others, and passing along information to others).

The findings of this study partially supported the alternative hypothesis. Job design characteristics contributed to the successful aging outcomes of personal sense of control and generativity in a sample of 109 older workers in national corporations and independently owned home building stores in Connecticut. The sample consisted primarily of high functioning older White males (82.6%), who were married (80%), close

to retirement age (mean age 64.09 years), in average health or better (93.5%), and who had received some college or technical education beyond high school (62%). About half of these older workers had been working in a sales associate job for over 5 years (54.1%) that was related in some way to previous job experiences (71%).

Results of standardized surveys measuring indices of successful aging (the Social Network scale, the Emotional Support scale, Mirowsky Ross 2 X 2 Index of Sense of Control scale, and the Loyola Generativity scale) indicated that, overall, this sample of older workers was a high functioning group of older adults whose scores on successful aging measures were higher than or comparable to highly functioning older adults in the MacArthur studies (Seeman et al., 2001). Similarly, scores for the Mirowsky Ross 2 X 2 Index of Sense of Control scale and the Loyola Generativity Scale were similar or higher than age-related samples (Bird & Ross, 1993; McAdams, personal communication, September 15, 2008). Although one cannot state whether participation in the labor force is a cause or effect of high functioning, older workers in this appeared to be functioning at a higher level than age-related samples reported in the literature.

Multiple regression analysis indicated that two indicators of successful aging were impacted by job design: generativity and personal sense of control. Job design variables collectively contributed 23% to the variance in generativity and 15.5% of the variance in personal sense of control. The job design variables that contributed the most to successful aging variables were skill discretion and coworker support. Skill discretion alone explained 11.4 % of the variance in generativity suggesting that jobs designed with opportunities to develop and use a variety of skills contributed to their opportunities to

pass along knowledge to younger generations. Decision authority and coworker support contributed minimally to variance in generativity. The job design characteristics of coworker support and skill discretion contributed to personal sense of control. These outcomes are addressed within the context of advancing the constructs of successful aging and healthy job design.

Expanding the Theoretical Constructs of Job Design and Successful Aging

The outcomes of the study expand the understanding of the two theoretical constructs addressed in this research: workplace job design (Karasek & Theorell, 1990) and successful aging for older adults (Rowe & Kahn, 1998). Figure 4 graphically displays the relationship between independent (job design) and dependent variables (successful aging) in the study. The first assertion that the design of a job can contribute to successful aging is supported by the outcome that two major psychosocial tasks of successful aging, generativity and personal sense of control, were impacted by the design of older workers' jobs. The second assertion that work contributes to the health of older adults is supported by the demographic characteristics of this sample of older workers and qualities of the work environment. Each assertion is explained and supported by the outcomes of the study and current research.

The Design of a Job Contributes to Successful Aging

Figure 4 shows that the job design characteristic skill discretion was the primary contributor to the successful aging outcome of generativity; skill discretion and coworker support were significant contributors to personal sense of control.

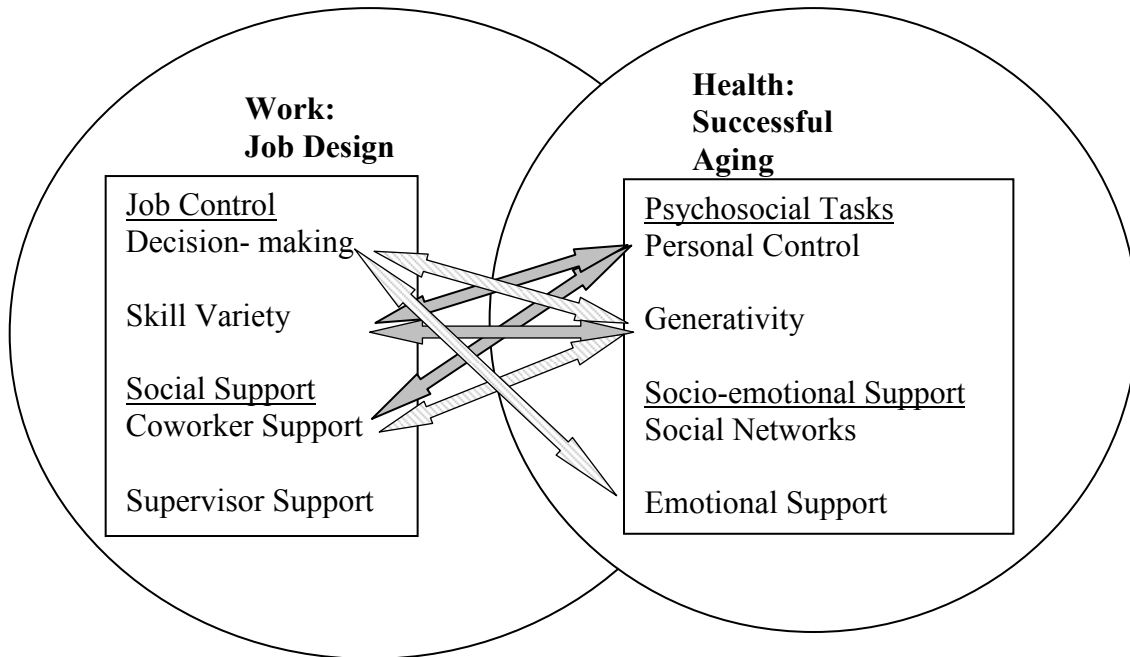


Figure 4. Final relationships among workplace job design variables and successful aging variables. Gray arrows represent significant contributions of the job design characteristics to the successful aging variables in multiple regression equations; patterned arrows represent small relationships among variables and insignificant contributions in multiple regression equations.

Generativity. The importance of generativity has been associated with older adults' successful adaptation to older adulthood (Erikson, 1997) and for the transmission of cultural mores to younger generations. However, a person's ability to be generative is dependent upon the social environment which is shaped by cultural demand. In contemporary society, generativity may be harder to enact due to limited

intergenerational contact and decreasing esteem given to older adults' knowledge base and set of values (McAdams & de St. Aubin, 1998; Sanders & McCready, 2009). One avenue that has not been explored to a great extent is the range of social roles in which an older adult may enact generativity (Hedge, Borman & Lammlein, 2006; McAdams & de St. Aubin, 1998).

The results of this study suggest that generativity can be enacted and promoted through the social role of a worker. In this study, over 75% of the older workers possessed knowledge about do-it-yourself (DIY) home building fixes that were directly related to the job; other (non-handy) older workers brought people skills and organizational skills to the workplace. Clearly, do-it-yourself skills were highly valued and sought after by the customer base and younger workers, and thus, this study may represent an idealized example of workplace generativity. However, when scores from the Loyola Generativity Scale were compared between those older workers with trade experience and those without direct trade experience there was no significant difference in generativity outcomes (*previous trade-related experience*, 18.68; *previous non-related work experience*, 17.90; $t = -.924$, $df (104)$, $p = .358$). These results indicate that, even without trade specific skills, older workers are able to pass along knowledge and information to younger workers through their involvement in the workplace.

Likewise, older workers can view the workplace as a means to contribute to society and leave a personal legacy. Older workers were able to enact two aspects of generativity, creativity and productivity, through their abilities to solve customers' problems and creatively explain home building concepts according to customers' levels

of knowledge. DeLong (2004) and Goldberg (2000) advocate that older workers' tacit knowledge and problem-solving skills are crucial to corporate systems integration and knowledge management, a corporate interpretation of generativity. Thus, older workers can contribute work experiences and life skills to a workplace and job position that offers opportunities to embrace them.

Managers can facilitate generativity by creating a culture of respect for older workers. Managers can design jobs to utilize older adults' knowledge, business acumen, people skills, leadership, and technical skills. They can reexamine organizational structures so that older workers retain positions of responsibility such as training and mentoring younger workers. Managers should respect the breadth of skills and experience that older workers bring to their jobs and seek advice from older workers themselves whenever possible. Such a workplace design would provide opportunities for older workers to fulfill their psychosocial needs to be productive individuals and teachers to younger generations

Workplace generativity may also serve the broader social impact of transmitting cultural values to other generations, although the messages transmitted may vary from generation to generation. Whereas previous generations passed along trade specific skills to younger workers (Smola & Sutton, 2002), this generation of younger workers tend to be more technically savvy than their senior counterparts. Therefore, older workers in contemporary society may pass along broader messages related to solving problems, dealing with people (customers), listening to others' needs, and promoting self-reflection for future life endeavors. Gerontologists consider these capabilities to be strengths of

older adults as they age (Birren & Schaie, 2006; Bonder & Wagner, 2001). Workplaces may be pivotal in redefining the context and content of generativity from a skill-based transmittal of knowledge to a broader context-dependent approach for critical thinking, problem-solving, and negotiating customer interactions provided that a culture of respect is established. A service-related worker role may represent an ideal venue for generativity given that older workers' people skills can be showcased. In blue collar environments, generative attempts have been minimized and even criticized by younger workers when work roles emphasize only physical job demands (Sanders & McCready, 2009).

Personal sense of control. Personal sense of control is an adaptive strategy in older adulthood related to perceiving control over a person's physical and social environment. A low sense of personal control has been associated with psychological distress, learned helplessness, and depressed mood (Baltes & Baltes, 1990; Rowe & Kahn, 1997).

Personal control in older workers would also appear to be fostered through a workplace design that features teamwork among coworkers and use of a variety of skills. In this study, the job design variables of skill discretion and coworker support contributed to a significant proportion of the variance in personal sense of control. Although Bandura (1997) suggested that older workers may experience decreased sense of control over the work environment if their skills become obsolete, this sample older workers indicated that their skills were valued by customers and coworkers, and utilized on a regular basis. Further, their skills were updated through ongoing retraining to maintain technical expertise in DIY home building skills.

Personal control is also nurtured through mastery of a person's social environment which occurs through workplace teamwork, collaboration, and social respect. Older workers collaborated with coworkers to complete work-related tasks and control work functions, which appear to impact their perceived capacity to control life events on a larger scale. The outcomes of this study partially support those of Ross and Wright (1998) who investigated the degree to which job control (defined as social support, decision-making, and skill variety) was related to the broader construct of personal sense of control. Ross and Wright found that jobs in which workers perform a variety of tasks, solve problems, and interact with people they enjoy are associated with high personal control. These concepts are reflected in the DCM variables of skill discretion and coworker support.

However, Ross and Wright (1998) also found that high levels of personal control were associated with jobs characterized by autonomy, decision making, and freedom from close supervision. In this sample of older workers, decision making (decision authority) was not significantly related to personal sense of control. This finding was unexpected since decision making is a key facet of job control in the DCM (decision authority and skill discretion form the construct of job control, called decision latitude). In the DCM studies, decision authority and skill discretion are highly correlated and integral to a healthy job design (Karasek & Theorell, 1990; 1996). This outcome suggests that the construct of a healthy job design may be different for older adults than for all workers in general.

The construct of a healthy job design for older adults. The construct of healthy job design may be different for older adults than for younger or middle-aged workers. The small contribution (insignificant in the MR equation) of decision making to successful aging outcomes may reflect older workers' reduced needs for control or achievement at this point in their careers. Older adults may have reduced expectations about what a job should offer and accept the procedural constraints in a job (including the lack of opportunity for decision making) cognizant that independent decision making is limited by standard operating procedures in many entry-level jobs. Alternatively, older adults may be complacent about not being acknowledged in company decisions since their overall purpose for work has changed from a career orientation to more simply, productive engagement. These interpretations are supported by current studies of older workers.

The AARP (2003) *Working in Retirement Study* reported that older adults were motivated to work not only for financial gains, but also for the desire to remain productive, stay mentally and physically active, perform meaningful activities, and socialize with others. In qualitative studies, older adults reveal that self-efficacy, intergenerational contact, social support, and recognition are important to this generation of older workers (Altschuler, 2004; Noonan, 2005; Sanders & McCready, 2009). In this study, a lower percentage of workers reported opportunities for decision-making and autonomy as compared to skill variety; however, older workers were still positive about the entire work experience. Almost 80% of respondents agreed that they could make their own decisions, but fewer participants noted they had a lot of input into their jobs (57%).

Thus, decision making abilities may be less important for older workers than for other populations of workers. Older adults may have less need to control their jobs and more a need to feel productive, respected, skilled, and included in the social environment.

Mirowsky and Ross (2007) recently challenged the notion that autonomy (decision making) and skill variety (termed *creativity* in their studies) combine to create the construct of job control, the hallmark of a healthy job design according to Karasek and Theorell (1990). Mirowsky and Ross found the constructs of autonomy and creativity to be distinct attributes in employed and non-employed populations. Researchers found that individuals who are employed express lower autonomy but higher creativity (at work and in other life endeavors) as compared to individuals who are unemployed across industries, occupations, and organizational levels. Thus, even though the entry-level job position of a sales associate offered fewer decision making opportunities, older workers were able to use their own persona in a creative manner to communicate their experiences, stories, and interact with customers on an individual level. They perceived opportunities for creativity and skill development without the autonomy afforded.

Impact of organization on job design. Although the job description for a retail sales job in the home building industry was similar among different companies, the organizational structure may have impacted the job design at the individual worker level. In this study, job design characteristics were compared between independently owned and corporate home building stores. Survey outcomes indicated that older workers in corporate stores expressed higher levels of skill discretion (creativity and skill development) than those in independently owned stores; and workers in independently

owned stores expressed significantly higher levels of supervisor support and total social support than those in corporate stores. Only the successful aging outcome of generativity was higher in corporate owned stores, possibly due to a great emphasis on educating consumers, development of specialty niches, or a greater volume of customers.

These findings support a recent study that examined the variance in job characteristics within similar occupations at different organizational levels (Bolin, Marklund, & Bliese, 2008). Bolin et al. investigated the magnitude of organizational impact on job demands and job control at four levels of organizational involvement: a parent organization, an establishment (store), a subunit (department), and the individual level. Bolin et al. found that all levels of organizational input impacted the variance in job characteristics: the establishment level (middle level, store) was most important for impacting job demands; and the subunit level had the greatest impact on worker job control (skill variety and decision making). This finding suggests that managers can impact workers' experiences relative to job control within a particular industry and occupation.

The second assertion involving the overall benefit of work for older adults' health is presented. The demographic information from the study is the primary source of support.

Work Contributes to the Health of Older Adults

Health for older adults has recently been studied within the context of successful aging as advanced by Rowe and Kahn (1998). Successful aging is equated with high

physical functioning, cognitive functioning, and active engagement in life, all of which can be realized in the role of a worker. The outcomes of the study indicate that *work in the service industry contributes to the health of older adults*. In this study, the demographic information and successful aging variables indicated that, by all accounts, this sample of older adults is healthy and aging successfully as compared to other age-related samples. Although this study did not compare health outcomes between older workers and nonworkers, the good health reported by this sample of older workers supports outcomes by Ross and Mirowsky (1995) and Rooks and Antestenis (2006) indicating a positive relationship between working (paid employment) and self reported health in older adults. The evidence to support this proposition is presented relative to each aspect of successful aging.

Work contributes to high physical functioning. Only 6% of this sample of older workers reported poor health, whereas close to 20%-27% of all older adults in the United States report poor health or a chronic disability that interferes with life functions (Friedman, Martin, & Schoeni, 2002; Rooks & Antestenis, 2006). The likelihood of having a work-limiting medical condition increases with age such that almost 23% of older workers aged 54-65 have a disability that precludes their ability to work (LaPlante, Kennedy, Kaye, & Wenger, 1995; Schofield, Fletcher, Earnest, Passey, & Shrestha, 2008). Although one may argue that initial good health (self-selection) enables older adults to return (or remain) in the workforce, older workers in this study appeared to maintain a high level of physical functioning through their daily job tasks.

The job tasks for the position of a retail sales associate require that workers stand continuously or maintain a trunk supported position (if in a wheelchair) for the duration of their shift (BLS, 2003). In the home building industry, the physical job demands appear higher, such that sales associates must walk and stand constantly to assist customers, lift and move bulky items without assistance, and climb ladders up to the height of 12 - 16 feet in order to obtain or stock merchandise (U. S. DOL, 2005). These physical work demands are not sedentary; they fit the “Light” category of work given the constant activity demands (ONET, 2006).

In this sample, older adults worked a mean of 36.46 hours per week (range 12 - 60 hours) on a part-time (40%) or full-time basis (60%). Although older adults worked fewer hours as they aged (a significant negative association existed between age and hours worked [$r = -.452, p = .000$]), the minimal number of hours any participant worked was at least 12 hours per week. In this study, there was no significant difference in the reported health of part-time versus full-time workers. Thus, the constant standing, walking, lifting, and carrying in this job would appear to contribute to the health recommendations for older adults offered by the CDC (2008): 2 hours and 30 minutes of moderate aerobic activity per week for older adults in order to maintain health.

High cognitive functioning. Although this study did not formally measure cognitive functioning, older adults used complex cognitive skills in order to interact with customers and apply product knowledge to DIY problems. The job description for a sales associate states that older workers must “know all departments/areas and effectively promote products and services; make decisions in line with the goal of selling;

demonstrate and maintain a thorough knowledge of the products and services” (DOL, 2005). In this study, 97% of older workers reported that they learned new skills on the job and 93% agreed they performed a variety of tasks. Further, 84% of all older workers indicated they used creativity to solve problems with customers and coworkers. Older workers noted ongoing opportunities for training (formal and informal) which is unique for the job positions of many older workers (BLS, 2001). These job tasks reflect the use of high cognitive functioning during in order to effectively accomplish the job. Schooler, Mulatu, and Oates (1999) found that performing cognitively complex work, such as that described, increased the intellectual functioning of older workers in the National Longitudinal Survey even late in their careers.

Mirowsky and Ross (2007) equated creative work (cognitively complex) with good self-reported health on a scale that exceeds education and household income. This finding implies that employment provides an outlet for creative self-expression, even within lower-level jobs, that is associated with high physical functioning and self-perceived health. The mechanisms through which creativity affects health are postulated as psychosocial channels of improved self awareness, sense of control, and mood, as well as biological channels that regulate stress and energy expenditure (Lee, Glass, McAtee, Wand, Bandeen-Roche, Bolla, et al., 2007; Mirowsky & Ross, 2007).

Active engagement in life. Rowe and Kahn (1998) defined active engagement in life as opportunities for *interpersonal relationships* and *productive activities*. However, prescriptions for the type and qualities of these relationships and activities are still being explored. Menec (2003) found that participation in social activities such as senior groups

and productive activities such as light housekeeping were related to happiness in older adults.

This study of older workers supported that work provided opportunities for social participation. Older adults exercised opportunities for social interaction and productivity in their job positions as sales associates. Older workers developed interpersonal relationships with coworker and supervisors during their daily work roles. Eighty-four (84%) of all older workers reported that supervisors and coworkers were concerned and interested in them; 97% reported that coworkers were friendly and helpful at completing tasks; and 98% of all older workers felt they passed along knowledge to customers and coworkers. Thus, almost all workers participated in some level of interpersonal interaction. A significant, positive relationship existed between social support in the workplace (combined supervisor and coworker support) and years working at the present title ($r = .274, p = .005$) suggesting that older workers developed increasingly closer relationships with longevity in a job position.

However, there was no significant contribution of work-related social support to older workers' personal social networks as measured by the Social Network scale; and, emotional support was minimally (yet significantly) related to coworkers being interested in them ($r = .236, p = .012$) and coworkers working together ($r = .218, p = .024$). Thus, although intimate relationships may not be fostered through workplace participation (possibly due to changing work schedules or limited time for personal conversation), there appears to be friendly interaction (and respect) among coworkers of all ages.

Despite the lack of association between social networks and job characteristics, close personal relationships may not be the only type of relationship advocated by Rowe and Kahn (1998). Menec (2003) found that less intimate social group participation (such as formal and informal social groups and sporting events) was also related to the successful aging outcome of happiness in older adults. Since older workers in this study reported interpersonal relationships with supervisors, coworkers, and customers that became stronger over time, and were a source of emotional support, older adults may not necessarily seek close personal friends in the workplace but find enjoyment and emotional support when needed. These results suggest that older workers did have positive social interactions in the workplace although they may not be as close or intimate as those measured in the Social Network scale.

Participation in *productive activities*, the other aspect of active engagement, was also realized for workers in this study. Productive activities have been defined as behaviors that produce valued goods and services through activities such as paid employment, volunteering, housekeeping, and care giving, among others (Rooks & Antestenis, 2006; Rowe & Kahn, 1998). Productive activities, such as work, are assumed to support health by expanding social contacts and establishing a positive identity, increasing demands for mobility and cognitive processing, and by providing opportunities to serve others and feel useful (Birren & Schooler, 2006; Ross & Mirowsky, 1995; Schaie & Schooler, 1998). All older workers in this study were engaged in a productive activity by virtue of participating in paid employment.

The concept of feeling productive was more specifically measured by the Loyola Generativity scale in relation to generativity. At least 85% of all older workers felt they were productive and 88% reported that they gave advice to others, another indication of productive engagement with work. Two aspects of generativity, creativity and productivity, were enacted through older workers' assistance in solving customers' problems and creatively explaining home building concepts according to customers' levels of knowledge. Although Avery, McKay, and Wilson (2007) found that older workers were most engaged in work when interacting with same-age peers with whom they enjoyed, this study of sales associates did not find any indication that an intergenerational workforce minimized engagement or productivity in the workplace. (In this study 97% of all older workers found coworkers to be friendly and helpful). Thus, work in the service industry can be considered a health-promoting activity that contributes to older adults' cognitive, physical functioning, and active engagement with life.

The Construct of Successful Aging as Enacted in the Workplace

Successful aging variables relevant to the workplace. The construct of successful aging is defined according to various perspectives as discussed in chapter 2. Four different outcome variables were chosen for this study because no one assessment adequately reflects the desired variables relative to successful aging in a workplace. This study took a sociological approach defining successful aging according to outcomes that may be affected by the social environment of the workplace and the organization of the

job. Although the theories of personal sense of control, generativity, social network, and emotional support are commonly associated with successful aging (Erikson, 1997; Seeman et al., 2001), these concepts have differing theoretical bases and have not been grouped in previous studies to represent one successful aging construct.

This study indicated that three of these four variables appeared to represent the construct of *successful aging in the workplace* when grouped together. The correlation coefficient matrix in Table 9 shows significant associations between personal sense of control and emotional support ($r = .228, p = .018$), personal sense of control and generativity ($r = .320, p = .001$), emotional support and generativity ($r = .348, p = .000$), and emotional support and social network ($r = .271, p = .005$). The small to medium correlations suggest that similarities exist in the underlying philosophies and concepts relative to constructs. As discussed, the variable of social network may not be relevant to future studies of workplace social interaction since the scale reflects only close, personal relationships that may not be typically fostered in the workplace.

Alternate theoretical perspective for studying older workers: Human Capital Theory (HCT). HCT is an alternate theoretical perspective that may be relevant to older workers. Human capital refers to the productive capacity developed, embodied, and stored in human beings. As humans invest in themselves through education, training, and good health, they are developing personal resources and an economic capacity to continue productive lives. Mirowsky and Ross (1998) suggested that personal sense of control and human capital theories converge, in that people who feel in control of their own lives develop healthy, productive lifestyles.

HCT may explain the overall high scores for personal sense of control for this group of workers who are actively engaged in helping themselves stay active, healthy, and engaged as productive members of society. It may also explain the significant associations between personal sense of control, health, and education (personal sense of control and health: $r = .249, p = .01$; personal sense of control and educational attainment: $r = .236, p = .014$; health and education: $r = .237, p = .013$). HCT may be a theoretical concept relevant for future study on older workers.

The following sections provide recommendations to optimize older workers' experiences in the workplace. The recommendations are presented from the perspectives of older workers, businesses, and social policies.

Recommendations for Older Workers, Business, and Social Policy

Recommendations for Older Workers

Older adults should consider work as a means of maintaining good health as they age. Older adults should consider full- or part-time work as an option for engaging themselves in a meaningful, productive activity that promotes healthy aging. Older adults should seek job positions in complex, active, work environments in which opportunities exist for using and developing a variety of skills, interacting with coworkers or consumers, solving problems, and exercising creativity in the work role.

Older adults should also view the worker role as a means to transmit technical skills and cultural knowledge to younger generations in a workplace that values older workers' knowledge. Older workers should consider their cumulative experiences as valuable assets they bring to a workplace including career-related skills, broad knowledge

about organizational systems and people, and personal experiences, all of which contain generative messages. Cumulatively, the job tasks involved in service-oriented work environments, such as the home building industry, promote a contemporary view of successful aging for older workers (Erikson, 1997; Hedge et al., 2006; Rowe & Kahn, 1990).

Recommendations for Business

Business recommendations for older workers relate to age management; that is, managing older workers to optimize their individual and generational strengths. This study highlights recommendations for job design and management leadership that optimize older workers' strengths in the work arena (Ilmarinen, 2006).

Job design for older workers. A job design for older workers should emphasize their abilities to utilize a variety of skills and work collaboratively with coworkers. Jobs should be designed to minimize repetition and monotony by enlarging the tasks performed within a particular job description; or, by rotating workers to different jobs (within the same responsibility level). Job rotation can promote new skill acquisition, knowledge, or use of current skills in a different manner. Managers can provide ongoing retraining and develop older adults' expertise in specific product areas.

Managers should promote *coworker support* through teamwork and cooperative work with other employees (even within entry level jobs). Small work groups can be designed around product or services areas with the possibility for intergenerational work groups. Self-managed and self-directed work teams may enable older workers to

collaborate with coworkers using their broad problem solving skills and creative thinking that is associated with experience and tacit knowledge.

Generativity can be fostered by creating opportunities for intergenerational collaboration. Generativity can also be promoted through older workers managing project work teams, mentoring and training younger workers, becoming the subject matter experts for special policies, and participating in the creation of new projects. Although older workers do not express the need for positions of authority or ultimate decision making responsibilities, the workplace must foster a culture of respect for older workers in order for generativity to occur. Mentoring programs may help fill a supervision gap in providing new workers with direction from older workers when beginning a new job (Goldberg, 2000; Hursh, Lui, & Pransky, 2006).

Management approach. Older adults will benefit from a flexible style of leadership in which close supervision is not necessary once job tasks are learned. Many older workers in this study had little direct contact with supervisors, which may suggest older workers did not need specific direction, coaching, or guidance to perform their jobs. However, older workers sought variety, challenge, and creativity in their work and associated these job characteristics with successful aging. Therefore, a situational style of leadership would be relevant to older workers in which supervisors manage according to the capabilities of the workers (Yukl, 2005). Managers can delegate tasks to older workers and utilize their strong interpersonal skills, leadership skills, and experience to make suggestions for continuous improvement to service-related performance (Kidwell, 2003; McNaught & Barth, 1995; Pitt-Catsouphes, 2007; Robson & Hansson, 2007).

Organizational structure. Businesses may create nontraditional temporary or part-time job positions for older workers that capture and utilize their knowledge through consultation, organizational development, and futuristic planning. Older workers may be given special assignments that require high level, organizational knowledge; or, they may consult to organizational decision makers. Older workers may be utilized for providing input that creates workplace environments in which customer loyalty, customer education, personal respect, and intergenerational respect is valued.

Career trajectory. Older workers do not appear to strive for job positions in which power, authority, or achievement is the driving focus. Instead, older workers seek career paths in which they utilize their skill sets in new, creative ways, and are challenged in job assignments and responsibilities. Although supervisor relationships did not impact successful aging in this study, it would appear that supervisor roles could be broadened to create career paths or goals for older workers. Managers could facilitate personal goal setting for older workers and identify areas of engagement that may be the most satisfying to older workers (such as developing opportunities for intergenerational contact, generativity, socialization, or new skill learning). This process would encourage communication between older workers and employers so that workers would be motivated by personal goals which would ultimately contribute to the organization's productivity. The process would promote synchrony between the older workers' goals and those of the organization. It would offer social support and promote a balance between a personal life and vocational aspirations for the older worker (Robson & Hansson, 2007; Yeatts et al., 2001).

Recommendations for Social Policy

Culture of workplace respect for older workers. On a social systems level, organizations and corporations must establish a culture in which older workers are recognized as valuable assets to company and the labor force. The negative myths regarding older workers need to be replaced by the findings from this study and others that older workers are engaged, positive, productive, and generative additions to the workforce (Hedge et al., 2006; Hursh et al., 2006; McNaught & Barth, 1995). Employers and managers of workplaces need to integrate policies into their administration that ensure older workers training in work-related skills, flexibility in scheduling, and proactive disability management or workplace accommodations. A positive attitude toward older workers, such as that displayed in the home building industry, may help alleviate the unspoken perceptions of age discrimination that are not reported as violations of the Age Discrimination in Employment Act.

Human resource training. Corporations need to expand diversity training to include intergenerational respect, communication, and collaboration among workers of all ages. Corporations need to embrace and capitalize on the generative knowledge that older workers can pass along to coworkers and consumers. Managers themselves should undergo training that promotes their understanding of the aging process, the heterogeneity of older workers, generational differences in older workers' values, and unique ways of measuring older workers' performance.

Job skills training. Ongoing retraining is the key for retaining productive and skilled older employees (Fisk et al., 2004). Older workers may be encouraged to take

advantage of tuition free courses to update technical skills and enroll in older workers training programs already subsidized by federal governmental initiatives already in place for those eligible for Title V and ADA benefits.

Study Limitations

A number of limitations existed in this study, which affected interpretations and the ability to generalize results to all older workers in the home building industry. First, although the sample appeared to represent the population under study (older sales associates in the home building industry in Connecticut), specific groups of workers were underrepresented in the final sample, including women, those of varied ethnic backgrounds, those with low educational attainment, and those with poor self-reported health. Thus, the study results can only be generalized to older White men working in the home building industry in this region. Further, the unbalanced nature of the sample (relative to the number of older male versus older female workers and the number of older adults working in national versus corporate home building stores) limited the power of the study at detecting differences among groups and the ability to calculate statistical significance for comparisons. This limited power may increase the potential for a Type II error in not detecting differences among groups that really exist.

Second, bias relative to the researcher and participant interaction during recruiting may have limited older female workers' participation in the study. The number of refusals from older female workers was proportionately higher than older male workers. This may have been due to older female workers' lack of comfort divulging personal

information about their life situation (given that the researcher was a woman in a different role).

Third, the sample was a convenience sample of older workers. Thus, this may be a group who is more positive and willing to share positive experiences and who may have possessed a brighter outlook than workers who refused to participate. The use of a convenience sample further limits the ability to generalize beyond those stores in which older workers were actually employed.

Fourth, limitations existed in the measurement tools used in the study. The Social Network scale and the Emotional Support scales addressed only the quantity and quality of close personal relationships. Broader, casual and collegial relationships such as those found in work-related or community-based group settings may have been valuable to address. Further, the entire JCQ inventory was not used due to the length of the questionnaire. Thus, job demands and job stressors were not addressed. Increased knowledge of job demands may have provided a more complete understanding of the physical job demands relative to successful aging for this sample of older adults.

Fifth, demographic information was inadvertently omitted from the questionnaire and one question was presented in an ambiguous manner. The demographic questionnaire did not request participants' number of children; this information would have helped interpret qualitative answers for the number of close social ties. Further, the questionnaire did not include the number of work hours attributed to full- time or part-time work; this would have improved the validity in reporting full- or part-time status.

Future Directions for Research

Future research should study other samples of older workers from different industrial sectors, occupational groupings, and include more diverse workers (women and those with different backgrounds). In particular, job designs for older workers in blue collar or industrial jobs should be addressed relative to modifications in physical job demands. Such workers appear to have different experiences than those in the service industry (Sanders & McCready, 2009). Older female workers may also have different issues and concerns than older male workers given their tendency in this study and others (Altschuler, 2004) to be single and working full time.

Future studies on older workers may examine workplace generativity more closely by conducting qualitative, semi-structured interviews to understand the content of workplace generativity and the messages transmitted. Although research on intergenerational workplace values have been conducted (Smola & Sutton, 2002) more needs to be understood about how different generations work together and what type of knowledge is communicated.

Finally, future research may examine the impact of employment on older workers from a psychological perspective that addresses the individual personality differences in older workers versus non-workers, the role of optimism in older workers' perceptions of working, older adults' coping mechanisms for work-related stressors; or, from a vocational perspective, career trajectories for older workers and how their contributions be recognized in the workplace.

Social Impact

The graying of America will become a reality within the next few decades as 20% of the population will reach retirement age and potentially look forward to two more decades of life. This aging of America has created concerns relative to understanding how successful aging can be promoted to minimize disability; how businesses can survive the exodus of older workers from the American workforce; and how important cultural messages can be transmitted to younger generations. This study of older workers in the home building industry demonstrated that the workplace can meet the older adults' psychosocial needs for assuming personal control of their lives and for engaging in generative experiences while contributing to social economy. A respectful work environment that optimizes older workers' use of skills and coworker support can promote this realization.

Contemporary business leaders have emphasized the importance of a fit between the knowledge, skills, and ability requirements of the work environment and the older worker (Yeatts et al, 2000). Older workers in the home building industry exemplified an optimal fit between their past experiences and present job demands for skills and knowledge. Thus, workplaces can aspire to make the most of older workers' past experiences while challenging them to continue to learn, interact with others, and contribute to the welfare of others. These challenges exemplify the productive engagement and psychosocial tasks inherent in successful aging.

Older workers can be viewed as a national resource if we recognize the value of employing older workers and putting in place job designs that highlight their strengths

and needs. The social impact of this study is the realization that American workplaces can be recognized as social institutions that can meet the successful aging needs of older adults while enabling older adults to contribute to the economy and culture that supports them. The mutual support and interdependence between older adults and society is exemplified in workplace generativity, a ideal will promote a culture of healthy, productive, and actualized older workers.

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APPENDIX A:

JOB CONTENT QUESTIONNAIRE

Instructions: Please answer each question by checking off the one answer that best fits your job situation. Sometimes none of the answers fits exactly. Please choose the answer that comes closest.

1. What is your age? _____ Sex: Male Female

Marital status

- Single
 Married
 Divorced/Separated
 Widowed

Ethnicity (Race)

- African American Other
 White
 Hispanic
 Asian
 American Indian

What is your living situation?

- Live alone
 Live with family member
 Live with spouse or significant other
 Live with assistance
 Other _____

How would you rate your health?

- Excellent
 Above average
 Average
 Below average
 Poor

What is your education? (Highest grade completed)

- Junior high (8th and 9th) Four-year college
 High School Graduate school: Masters
 Two-yr college or trade school Graduate school: Doctorate

2. What is your job title? Please be specific _____

What do you do? _____

What business is your company? (i.e., home building) _____

How long have you been at this job title? _____

Previously, what was (were) your job title (s)? _____

How many years have you been working altogether? _____

For the questions below, please check the box with the answer that comes closest to your answer

3. My job requires that I learn new things.
- Strongly (1) Disagree Disagree (2) Agree (3) Strongly (4) Agree
4. My job involves a lot of repetitive work.
- Strongly (1) Disagree Disagree (2) Agree (3) Strongly (4) Agree
5. My job requires me to be creative.
- Strongly (1) Disagree Disagree (2) Agree (3) Strongly (4) Agree
6. My job allows me to make a lot of decisions on my own.
- Strongly (1) Disagree Disagree (2) Agree (3) Strongly (4) Agree
7. My job requires a high level of skill.
- Strongly (1) Disagree Disagree (2) Agree (3) Strongly (4) Agree
8. On my job, I have very little freedom to decide how I do my work.
- Strongly (1) Disagree Disagree (2) Agree (3) Strongly (4) Agree
9. I get to do a variety of different things on my job.
- Strongly (1) Disagree Disagree (2) Agree (3) Strongly (4) Agree
10. I have a lot of say about what happens on my job.
- Strongly (1) Disagree Disagree (2) Agree (3) Strongly (4) Agree

11. I have an opportunity to develop my own special abilities.
- Strongly (1) Disagree Disagree (2) Agree (3) Strongly (4) Agree
12. How many people do you work with?
- I work (1) alone 2-5 (3) people 6-10 (8) people 10-20 (15) people 20 or more (30) people
13. I supervise other people as part of my job.
- No (1) Yes (2) 1-4 Yes (3) 5-10 Yes (4) 11-20 Yes (5) More than 20 people
14. My supervisor is concerned about the welfare of those under him or her.
- Strongly (1) Disagree Disagree (2) Agree (3) Strongly (4) Agree I have no supervisor
15. My supervisor pays attention to what I am saying.
- Strongly (1) Disagree Disagree (2) Agree (3) Strongly (4) Agree I have no supervisor
16. I am exposed to hostility or conflict from my supervisor.
- Strongly (1) Disagree Disagree (2) Agree (3) Strongly (4) Agree I have no supervisor
17. My supervisor is helpful in getting the job done.
- Strongly (1) Disagree Disagree (2) Agree (3) Strongly (4) Agree I have no supervisor

18. My supervisor is successful in getting people to work together.
- Strongly (1) Disagree Disagree (2) Agree (3) Strongly (4) Agree
19. People I work with are competent in doing their jobs.
- Strongly (1) Disagree Disagree (2) Agree (3) Strongly (4) Agree
20. People I work with take a personal interest in me.
- Strongly (1) Disagree Disagree (2) Agree (3) Strongly (4) Agree
21. I am exposed to hostility or conflict from the people I work with.
- Strongly (1) Disagree Disagree (2) Agree (3) Strongly (4) Agree
22. People I work with are friendly.
- Strongly (1) Disagree Disagree (2) Agree (3) Strongly (4) Agree
23. The people I work with encourage each other to work together.
- Strongly (1) Disagree Disagree (2) Agree (3) Strongly (4) Agree
24. The people I work with are helpful in getting the job done.
- Strongly (1) Disagree Disagree (2) Agree (3) Strongly (4) Agree
25. I have opportunities to pass on knowledge to coworkers.
- Strongly (1) Disagree Disagree (2) Agree (3) Strongly (4) Agree
26. I have opportunities to pass on knowledge to customer and clients.
- Strongly (1) Disagree Disagree (2) Agree (3) Strongly (4) Agree

27. My family income level is:

- | | |
|---|--|
| <input type="checkbox"/> 0- 20,000 | <input type="checkbox"/> 60,001- 80,000 |
| <input type="checkbox"/> 20,001-40,000 | <input type="checkbox"/> 80,001- 100,000 |
| <input type="checkbox"/> 40,001- 60,000 | <input type="checkbox"/> >100,000 |

APPENDIX B:

LOYOLA GENERATIVITY SCALE

For each of the following statements please indicate how often the statement applies to you.

- 1 = if statement never applies
2 = if statement only occasionally or seldom applies to you
3 = if statement applies to you fairly often
4 = if statement applies you very often or nearly always

1. ___ I try to pass along the knowledge I have gained through my experiences.
2. ___ I think I would like the work of a teacher.
3. ___ I try to be creative in most things that I do.
4. ___ I have important skills that I try to teach others.
5. ___ Other people say that I am a very productive person.
6. ___ People come to me for advice.

APPENDIX D:

SOCIAL NETWORKS AND EMOTIONAL SUPPORT SCALE

Social Networks: Please write in the requested response.

1. How many of your children do you feel close to? _____
2. How many close friends/relatives do you have? _____

That is, people that you feel at ease with, can talk to about private matters, and can call on for help. Include spouse, children, grandchildren, siblings, relatives, friends, coworkers, and other people.

3. How often do you participate in group activities such as meetings for clubs or other groups, religious services, or other activities with a religious group?

Every day 2-3 times per week Once a week Once a month Less than once a month

Emotional Support: Please check the box that comes closest to your answer.

4. How often does your spouse make you feel loved and cared for?
Never (1) Rarely (2) Sometimes (3) Frequently (4)
5. How often is your spouse willing to listen when you need to talk about your worries or problems?
Never (1) Rarely (2) Sometimes (3) Frequently (4)
6. How often do your children make you feel loved and cared for?
Never (1) Rarely (2) Sometimes (3) Frequently (4)
7. How often are your children willing to listen when you need to talk about your worries or problems?
Never (1) Rarely (2) Sometimes (3) Frequently (4)
8. How often do your friends and relatives make you feel loved and cared for?
Never (1) Rarely (2) Sometimes (3) Frequently (4)

9. How often are your friends and relatives willing to listen when you need to talk about your worries or problems?

Never (1) Rarely (2) Sometimes (3) Frequently (4)

CURRICULUM VITAE

MARTHA J. SANDERS

36 Cherry Lane
Madison, CT 06443

FORMAL EDUCATION

- 2004 to present Walden University
PhD in Health Services
Specialization: Community Health
- 1996-2004 Masters of Science in Occupational Health and Safety
University of New Haven
New Haven, CT
- 1987-1990 Advanced Masters, Occupational Therapy
University of Southern California
Los Angeles, CA
- Award: Elizabeth J. Yerxa Award of Leadership
Grant Recipient: Adolescent Transition Training Program
U. S. Department of Education
- 1974-1979 Bachelor of Arts, Occupational Therapy
Tufts University
Medford, MA
Graduated Cum Laude

CERTIFICATION

- American Occupational Therapy Association
January 1979 Reg. 453159
- Connecticut License
October 1990 Reg. 968
- Certified Personal Trainer, Aerobic and Fitness Association
of America, June 1996
- Certified ROM Dance Instructor, 1998
- Certified Aging in Place Specialist, 2004
- Certified Professional Ergonomist (CPE) 2008

PROFESSIONAL EXPERIENCE

- January 1995 to Owner/Director

Coordinated hospital and community services. Performed clinical research.
Provided translations for Hispanic population.

August 1979 to Occupational Therapist
June 1981 St. John's Hospital and Health Center
 Santa Monica, CA

Provided adult psychiatric day treatment services and acute general medical services.
Developed programs in time management, socialization, and independent living skills for
diverse cultural populations. Supervised OT fieldwork students.

PROFESSIONAL SOCIETY APPOINTMENTS AND MEMBERSHIPS

Editorial Board, Work: A Journal of Assessment and Prevention, 2006 to present
Editorial Board, American Journal of Occupational Therapy, 1997-1999, 2004-2006,
2007-2009

Visiting Nurses Association, Professional Advisory Board, 1999 to present
Sigma Xi, National Scientific Honor Society, Quinnipiac Chapter 1995 to present
Nominations committee; secretary 2007 www.sigmaxi.org

Human Factors and Ergonomics Society, 2000 to present www.hfes.org

American Occupational Therapy Association 1979 to present www.aota.org

World Federation of Occupational Therapists 1981 to present

Connecticut Occupational Therapy Association 1990 to 1998, 2001- present

Chairperson Work Programs SIS 1992 to 1997 www.connota.org

American Public Health Association, 2005 to present www.apha.org

Arthritis Health Professionals Association of the Arthritis Foundation 1981-1991

Southern California Arthritis Health Professionals

President 1985-1986

Vice-President 1984-1985

Secretary 1981-1984

RESEARCH ACTIVITIES

Professional Research Completed

Computer training for Seniors; Occupational Stress in an Occupational Therapy Practice,
Ergonomics of Childcare; Adaptation to Shiftwork; Cumulative Trauma Disorders in
Dental Hygienists; Adolescent Learning in Two Work Environments; Independence As
Related to Locus of Control; Vocational Achievement for Persons with Disabilities.

GRANTS and AWARDS

Faculty Scholar of the Year Award, Quinnipiac University, 2006

Quinnipiac University 2006 Summer Research Grant Computer Training in Seniors
 Quinnipiac University 2005 Summer Research Grant- Occupational Stress in Occupational Therapy Clinicians and Educators;
 Quinnipiac University Faculty Supported Research Grant 2004-Comparison of Ergonomics versus Traditional Kitchen Tools;
 Quinnipiac University Summer Research Grant 2003 Occupational Stress in Dental Hygienists

PEER REVIEWED ARTICLES

- Sanders, M. J., & McCready, J. (2009). A qualitative study of two older workers' adaptataion to physically demanding work. *Work*, 32(2), 111 - 122.
- Morse, T., Bruneau, T., Michalak-Turcotte, C., Sanders, M., Warren, N. (2007). Musculoskeletal disorders of the neck and shoulder in dental hygienists and dental hygiene students. *Journal of Dental Hygiene*, 81 (1), 1-20
- Michalak-Turcotte, C. & Sanders, M.J. (2005) Developing a plan of action: Part 2. *Dimensions of Dental Hygiene*, 3(11), 20, 22-23.
- Michalak-Turcotte, C. & Sanders, M.J. (2005) A problem-solving approach to ergonomic intervention in dental hygiene: Part I. *Dimensions of Dental Hygiene*, 3(9), 18, 20-21.
- Sanders, M. & Morse, T.F. (2005). Ergonomics of caring for children: An exploratory study. *American Journal of Occupational Therapy*, 59 (3), 285-295.
- Morse, T.F., Michalak-Turcotte, C., Atwood-Sanders, M., Warren, N, Peterson, D.R., Bruneau, H., Cherniak, M. (2003). A pilot study of hand and arm musculoskeletal disorders in dental hygiene students. *Journal of Dental Hygiene*, 77, 3, 173-179.
- Sanders, M & Michalak-Turcotte, C. (2002). Strategies to reduce the risk of musculoskeletal disorders in dental hygienists: Two case studies. *Journal of Hand Therapy*, 15 (3), 363-374.
- Sanders, M. (2001) Sounding Board: Stress management in the workplace-whose responsibility is it? *WORK*, 17, 263-265.
- Michalak-Turcotte, C. & Atwood-Sanders, M. (2000). Ergonomic strategies for the dental hygienist-Part II, *Journal of Practical Hygiene*, 9, 3, 35-38.
- Michalak-Turcotte, C. & Atwood-Sanders, M.(2000). Ergonomic strategies for the dental hygienist-Part I. *Journal of Practical Hygiene*, 9, 2, 39-42.

Sanders, M.J., & Turcotte, C.A. (1997). Ergonomic strategies for dental hygienists. *WORK*, 8, 55-72.

Sanders, M.J. (1994). Women's socialization into non-traditional heavy work: A case study. *WORK*, 4 (2), 93-102.

Atwood, M.J. & Michalak, C.A. (1992). The occurrence of cumulative trauma disorders in dental hygienists. *WORK*, 9 (3), 17-31.

Atwood, M.J. (1992). Adolescent learning in two work environments. *WORK*, 9 (2), 61-81.

Atwood, M.J. (1985). Occupational therapy intervention with the adolescent with juvenile rheumatoid arthritis. *Occupational Therapy in Health Care*, 2 (3), 109-126.

CHAPTERS, BOOKS, AND NON-PEER REVIEWED ARTICLES

Sanders, M. (August, 2007). Your comfort zone: Proper lifting technique. http://www.wdjournal.com/articles/article_display.html?id=303745

Sanders, M. (July, 2007). Your comfort Zone: Body Mechanics.

Sanders, M. (June, 2007). Your Comfort Zone: Ergonomics of gardening http://www.wdjournal.com/articles/article_display.html?id=303745

Sanders, M, (2007, May). Comfort Zone: Stress management

Sanders, M. (2007, April). Comfort Zone: Wellness

Sanders, M. (2007, March). Comfort Zone: Ergonomics in the home. *Woman Dentist Journal*, 5 (3), 61-63.

Sanders, M. (2007, February). Comfort Zone: Computer Ergonomics in Dental Offices. 5 (2) *Woman Dentist Journal*, Can be retrieved at:

Sanders, M. (2007, Jan). Comfort zone: The benefits of stretching. *Woman Dentist Journal*, 5 (1), 65-67. Can be retrieved at:
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Sanders, M. & Wright, R. (in press). Work-related interventions. In Meriano, D. & Latella, D. (Eds.) *Occupational performance approaches to adult physical*

dysfunction: Wellness, Adaptation, and Remediation Thorofare, New Jersey: SLACK

- Michalak-Turcotte, C., Sanders, M., Dussetschleger, J., & Ing, M. (2006, Nov/Dec.). Selecting equipment to fit your ergonomic needs. *Woman Dentist Journal*, Nov/Dec, 32-36.
- Sanders, M. (2006) Health and wellness for occupational therapy assistants. In Early, B. (Ed.). *Physical management for occupational therapy assistants*. St. Louis: Elsevier.
- Sanders, M.J. (2006). Non-occupational contributors to musculoskeletal disorders. In *W. Karwowski (Ed.) International Encyclopedia of Ergonomics and Human Factors* (2nd ed.). Taylor-Francis: Philadelphia.
- Sanders, M.J., & Stricoff, R. (2006). Management of work-related musculoskeletal disorders: Clinical perspective. In *W. Karwowski (Ed.) International Encyclopedia of Ergonomics and Human Factors* (2nd ed.). Taylor-Francis: Philadelphia.
- Sanders, M.J.(2006). History of work-related musculoskeletal disorders. In *W. Karwowski (Ed.) International Encyclopedia of Ergonomics and Human Factors* (2nd ed.). Taylor-Francis: Philadelphia.
- Dillon, C., & Sanders, M.J. (2006). Classification and diagnosis of musculoskeletal disorders. In *W. Karwowski (Ed.) International Encyclopedia of Ergonomics and Human Factors*. Taylor-Francis: Philadelphia.
- Sanders, M.J. (Ed.)(2004) *Ergonomics and the management of musculoskeletal disorders*. St. Louis, MO: Elsevier.
- Sanders, M.J. (2004). A worldwide history of musculoskeletal disorders. In M.J. Sanders (Ed.) *Ergonomics and the management of musculoskeletal disorders*. St. Louis, MO: Elsevier.
- Baker, N. & Sanders, M.J. (2004). Individual worker perspective on MSDs. In M .J. Sanders (Ed.) *Ergonomics and the management of musculoskeletal disorders*. St. Louis, MO: Elsevier.
- Warren, N. & Sanders, M.J.(2004). Biomechanical risk factors. In M.J. Sanders (Ed.) *Ergonomics and the management of musculoskeletal disorders*. St. Louis, MO: Elsevier.
- Sanders, M.J. (2004). Ergonomics in the home. In M.J. Sanders (Ed.) *Ergonomics and the management of musculoskeletal disorders*. St. Louis, MO: Elsevier.

- Sanders, M.J. (2004). Ergonomics of caring for children. In M.J. Sanders (Ed.) *Ergonomics and the management of musculoskeletal disorders*. St. Louis, MO: Elsevier.
- Sanders, M.J.(2001). History of work-related musculoskeletal disorders. In W. Karwowski (Ed.) *International Encyclopedia of Ergonomics and Human Factors*. Taylor- Francis: Philadelphia.
- Sanders, M.J. & Stricoff, R. (2001). Management of work-related musculoskeletal disorders: Clinical perspective. In W. Karwowski (Ed.) *International Encyclopedia of Ergonomics and Human Factors*. Taylor-Francis: Philadelphia.
- Dillon, C. & Sanders, M.J. (2001). Diagnosis of work-related musculoskeletal disorders. In W. Karwowski (Ed.) *International Encyclopedia of Ergonomics and Human Factors*. Taylor-Francis: Philadelphia.
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