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RELATIONSHIP BETWEEN AGE AND EFFECTS UPON WORK: A STUDY OF OLDER WORKERS IN THE GARMENT INDUSTRY

City University of New York PH.D. 1980

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RELATIONSHIP BETWEEN AGE AND EFFECTS UPON WORK
A STUDY OF OLDER WORKERS IN THE GARMENT INDUSTRY

by

JOSEPH EISENBERG

A dissertation submitted to the
Graduate Faculty in Business in
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Abstract

RELATIONSHIP BETWEEN AGE AND EFFECTS UPON WORK
A STUDY OF OLDER WORKERS IN THE GARMENT INDUSTRY

by

Joseph Eisenberg

Adviser: Professor Angelo Dispenzieri

This country is challenged with an increasing amount of people growing older within the work force, which is raising problems and issues without an empirical basis for political and management decisions.

The objectives of the present investigation are:

1. The examination of the relationship between age and worker productivity, absenteeism, injuries and accidents, and turnover.

2. Refinement of the decremental theory of aging (Shock, 1962; Botwinick, 1973), by introducing a crucial distinction among jobs requiring skill and experience and jobs demanding speed and agility.

3. Improvement of retirement decision-making within industry and government.

The study was carried out in a large garment manufacturing plant in the New York Metropolitan area. Three jobs were selected for study: one speed job (Sewing Machine Operator, N = 66) and two skill jobs (Examiner, N = 60 and Material Handler, N = 65).

Four hypotheses referred to job tasks requiring speed and agility: the older worker as compared with the younger worker, will have I) less productivity, II) greater absenteeism, III) greater accidents and injuries, and IV) equivalent turnover. Hypotheses I and IV were confirmed.

Another set of four hypotheses referred to job tasks requiring skill and experience: the older worker will be equivalent to the younger worker in V) productivity, VI) absenteeism, VII) accidents and injuries and VIII) turnover. All of the latter hypotheses were confirmed.

Generally, the results support the predictions for speed jobs and skill jobs, with the added proviso that decrements appear specific to the demands of particular jobs. An age-related decline in worker performance was not substantiated.

Policy implications are presented, including elimination of arbitrary age limits on jobs and rational assignment of workers to jobs on an individual basis, as well as recommendations for future research.

ACKNOWLEDGMENTS

The following study was partially funded by the Administration on Aging, U. S. Department of Health, Education and Welfare, under grant number 90-AT-2016/01. It was carried out under the advice of the committee established by the Graduate Center of the City University of New York. It derived from the conviction that we do not have adequate studies in the field concerning the relationship between age and work.

Although a doctoral dissertation requires a major individual effort by the candidate himself, I cannot think of a successful achievement of this type of project without the full support, advice and guidance of a committed group of people involved in the candidate's advancement and future.

Special recognition and thanks go to this project's principal advisor, Dr. Angelo Dispenzieri, Professor of Psychology at Baruch College of the City University of New York, for direction, encouragement, assistance and patience, and to Dr. Lloyd Rosenberg, Professor of Statistics at Baruch College of the City University of New York, for his attempts, mostly successful, to repress the excess imagination of the writer and to stimulate instead the orderly thought process of the scholar and investigator. In sum, whatever merit this work may possess derives in large part from the constant effort from these two gentlemen.

The other members of my committee, Professors Ann Brandwein and Aaron Levenstein, supplied moral support during the conduct of this study which enabled me to endure, recognize my shortcomings in time, and to avoid defeat. Their disposition and advice served as an additional source of encouragement during the starting point, design, development and constant changes of this pioneering research work.

Acknowledgement is further due to a group of persons in the garment industry who spent their time and served graciously with experience, thoughts and advice from the standpoint of the real world situation. First of all, I must emphasize the help of Mr. Mitchel Lokiec, Director, Management and Engineering Department, of the International Garment Worker's Union. Without Mr. Likiec's help, it would have been impossible to collect data in particular factories of the garment industry. He possessed excellent knowledge of the workers, of the industry in general and of the specific conditions in the garment industry.

I hope that this study will constitute a new drive to promote the understanding of the older worker's role in the industry and their usefulness to our national economy in the 80's and the 90's. It can be of some use to four groups: first, to individual researchers concerned with the problems of aging and employment of the aged; second, to public institutions and to governmental legislators promoting welfare of the elderly and the whole population; third, to employers who may eventually change their minds concerning the contribution of the older workers;

fourth, to the unions which may become more involved in the lot of the older worker. This study is only a starting point in this direction.

Finally, I would like to thank Doris Finn for her friendship, understanding and help over the last several years and for typing my manuscript.

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CHAPTER I

INTRODUCTION

The difficulties faced by older workers in securing and retaining employment constitute a national problem which is becoming more pressing as the number of older persons in the labor force rise due to dramatic increases in life expectancy during the 20th century. According to Harris (1978, p. 3), one of every ten Americans, or 22.4 million, are 65 and over, in comparison with 1900 when the elderly amounted to only three million, or one in every 25 persons; by the year 2000, 30.4 million, or one in eight persons will be 65 and over.

There are many factors which contribute to the difficulties of older workers. One type of problem results from the physical decrement which accompanies old age, such as the loss of agility and the lessening of energies, as well as the increase in illness and dependency (the decrement theory of aging, Schock, 1962; Botwinick, 1973). On the other hand, the aged in the U.S. have basic problems resulting from social and political institutions in this country that have victimized the elderly. Butler (1975) calls this the tragedy of old age in America. The pattern of the income and tax structure, employment, transportation, and housing opportunities, and vulnerability to crime, are a function of the diminished status of the aged in American youth-oriented society.

Age stereotypes may furnish an explanation for much of the declining status of older workers. Rosen and Jerdee (1976) and Rosen (1978) found that the older man was seen by the manager as less productive, less ambitious but more stable, resistant to change, disinterested in technological challenge, unable to change, unable to cope with stress and lacking creativity. Because these age stereotypes influence managerial decisions, it is possible to understand the source of the negative attitudes of managers towards aged people. These studies have shown that assumptions about the decline in mental and physical capacities of older workers were combined with biases in personnel decision.

The belief that work performance declines with age is widespread. This stereotypic perception occurs among many managers and constitutes one of the most crucial barriers to the employment opportunities and the retention of the older worker. Mark (1956) presents the reasons for not hiring older workers, including: (1) fear of increasing workmen's compensation and insurance costs, (2) concern for productivity of older workers and their supposed general inability to meet physical requirements, (3) greater injury rates, and (4) difficulties in training and retraining.

The point of this study is to explore how much factual evidence there is supporting the stereotyping and the overall prejudices that link old age (and even middle age) with senility, incompetence, decreasing productivity, absenteeism, accidents and injuries, and, generally, a lack of worth in the job market.

The answer concerning the real value of the older worker becomes extremely important for the national economy of the U.S. because of the

graying of America. In regard to a need for employment opportunities for the elderly, Harris (1978) points to the following factors: (1) Social Security financing problems which may limit benefits, (2) inflation continuing to lower purchasing power, (3) older persons favoring more continued involvement rather than withdrawal, (4) level of education, and (5) social services for the elderly getting more costly.

With the projection of growing numbers of middle aged and elderly Americans in the population and the labor force, executives, scientists, governmental institutions and unions have a good reason to be interested in the relationship between age and its effects upon work. From a managerial standpoint, the problem is how much the older worker still can offer and how the organization can contribute to ensure that their human resources continue to be most effectively used. Human and economic considerations dictate that we provide appropriate employment for the older worker and help reduce the tragedy of the aged in the U.S. General policies can be designed according to the requirements of the society and the needs of the industry and the workers.

This investigation will provide an analysis of the relationship between age and job related factors, to fill the void in recent studies on this matter, and will attempt to dispel the myths resulting from ignorance, an emphasis on youth culture, and premises built into the society during the previous decades. Organizations, government institutions, and unions have to be alert to the changing composition of the work force and its needs as a function of age, health, qualifications and willingness to perform, and must be flexible in replying to satisfy these needs.

This study will reflect real age and job related factors and will attend to the following issues:

1. The first aim of this research is to examine the relationship between age and its effects upon worker productivity, absenteeism, injuries and accidents and turnover.

2. The second aim of this investigation is to enrich the conceptual background of the decremental theory of aging by making a crucial distinction among jobs requiring skill and experience and jobs demanding speed and agility. This division is made in order to refine and test particular hypotheses. No previous study in a particular industry or plant has presented this type of distinction.

3. The third aim of this study is the presentation of some moderating variables for each job separately. No known study has introduced the influence of these moderating variables in these contexts.

4. The fourth aim of the present research is to improve the data base supporting retirement decision making within industry, government and society.

An anticipated result of the proposed research is to help offset the effects of age bias and other myths surrounding aging. The results will have both theoretical and policy implications.

In the following section, a review of the literature relevant to aging will be presented. Six focal points will be considered: 1) intelligence, 2) productivity, 3) the related issues of absenteeism, turnover, and injuries, 4) willingness to retire, 5) impairment of cognitive functioning in the elderly, and 6) biological vs. psychological aging.

CHAPTER II

REVIEW OF THE LITERATURE

A. Intelligence

Although aging is a multifaceted process, the study of intelligence with regard to aging has received an overwhelming, if not disproportionate, amount of attention. This review begins with a consideration of those issues in intelligence that may bear on productivity of the aging worker.

Schaie and Parham (1977) concluded, after an extensive analysis of the effects of aging on intelligence, that the presumption of a generalized decline remains unconfirmed. These researchers consider "intellectual decrement" to be highly specific with regard to variables and individuals. They argue that little data is available for justifying generalizations on decline. Nevertheless, as Schaie and Parham also admit, there is no question that some decreases in intellectual function are shown by most people of advanced age on present day psychometric tests. For example, Berkowitz and Green (1965) and Green (1969) in a longitudinal study of men from 56 to 65 discovered that those closer to 65 did more poorly on the Wechsler-Bellevue intelligence test. The mean scaled scores declined on every subset of the test and, approximately, by the same relative amounts. After controlling for potentially biasing factors in the samples, such as the continuing cognitive activities of

some members, the decline in evidence was attributed to the process of aging.

One factor not accounted for in the study by Berkowitz and Green was that of test fatigue. Furry and Baltes (1973) investigated the test fatigue variable and found that older people tended to tire more readily during extended testing procedures. This, they concluded, impairs performance. Earlier studies by Birren and Morrison (1961) showed other extraneous variables which might influence measured intelligence, such as education level, economic status, and cohort cultural, and generational factors. These researchers reported a higher correlation between intelligence test scores and education level than between intelligence test scores and age.

Followers of Schaie caution against the significance attached to the decreasing intelligence hypothesis, while followers of Horn and Donaldson (1976 and 1977) espouse the decreasing intelligence hypothesis as determinative in the aging process. As an alternative explanation, Schaie and his associates (1977) point to the cultural obsolescence concept as determining the decreasing performance of the elderly, outside of deteriorating biological mechanisms. (Botwinick, 1973, p. 193)

This controversy sets the stage for evaluating the literature related to productivity and age. As in the case of intelligence, it has been presumed that productivity decreases with age.

B. Productivity

An early comprehensive review of the literature relating to the older worker was presented by McFarland (1943) during World War II when

manpower was short. From the scanty information available, he concludes that the output of older workers is less than that of younger ones. McFarland, however, suggests that decreased output of the older worker is compensated for by various other conditions. These include: (a) fewer industrial accidents, (b) less breakage and spoilage, (c) less turnover, and (d) greater responsibility. When translated into output, McFarland argues that these factors more than balance out the decreased productivity, leaving a "net contribution to company operations". McFarland's notions support the results of Palmer and Brownell (1939). In a study of six companies in the textile industry and in nonferrous metal manufacturing, these writers reported that older workers remaining on the payroll maintained the overall minimum production standards of younger persons even though per-unit productivity of the older persons was slower.

Griew (1964), building on the work of Wackwitz (1946), examined speed and wastage of four groups of workers - skilled engineers, glass-blowers, semi-skilled and unskilled workers. His findings tended to show that there was only a slight decrease in per-unit productivity between middle age and older age personnel.

In a series of studies conducted by the Bureau of Business Management of the University of Illinois (Peterson, 1955), supervisors in 81 organizations were asked to evaluate productivity of those aged 60 and above in industrial, office and managerial positions. The survey covered 3,077 individuals. The supervisors concluded: (1) that a majority of the workers aged 60 and above were as good as, or superior to, average younger workers with reference to absenteeism, dependability, judgment, work quality, and human relations; (2) there was no specific age at which

an employee becomes unproductive; - satisfactory work performance can continue to the eighth decade; (3) 69 percent of the older workers have few apparent or specific weaknesses.

Welford (1958) noted that the productivity gap between older and younger workers is narrow in normal work situations, when the older persons are in full possession of their faculties. It is only when capacities are tested to the limit that their impairment becomes apparent. According to Burke, et al. (1953), the maximum endurance of older persons is less than the maximum of younger persons. It is in this vein that Welford says older people have reduced reserves. Decline in speed of performance is one such situation where the elderly do not have the reserve capacity to keep up their output under pressure (Welford and Birren, 1965).

Three BLS surveys were conducted between 1956-1961 to compare worker productivity in three work contexts having different physical requirements and stress conditions (Walker, 1965; Kelleher and Quirk, 1973). One study focused on office workers (Kutscher and Walker, 1960 and Bulletin 1273/BLS, 1960).

The study concluded that (a) differences in the output per man hour among the different age groups are not significant, (b) there is a considerable variation within the particular age cohorts, (c) workers in the older age groups have less variation than workers in the younger groups, (d) older workers maintained an equal degree of accuracy, (e) experience in a job seemed to be the crucial factor influencing average performance among the different age groups; within all age groups

employees who had more than 9 months on the job, had practically the same average rate of output.

A study of the footwear and household industries (U.S. DOL Bureau of Labor Statistics Bulletin 1203, Sept. 1956) produced different results. Among these workers, performance was highest for the 25-34 age group, while workers above 60 had significantly lower average performances. The authors argue that the difference may be explained by higher physical demands placed upon factory workers in this environment.

In a study of Federal Mail Sorters (Walker, 1964), the results were comparable to those in the office work context; they showed that differences in output among the various age levels were non-significant. Only where physical effort was required by the job could a distinguishable decrease in productivity be identified for the above 45 group.

These studies seem to shed some light on the reserve capacity hypothesis identified by Welford (1958): the reserve capacities of the elderly decrease where sheer physical stamina is required in performing a job and/or the stress is continuous (Bromley, 1974, p. 156).

Experimental studies relating to the reserve capacity hypothesis were carried out at the Nuffield Research Unit in Cambridge, United Kingdom. Welford (1958) tested subjects to the limit of their performances on particular types of tasks. Differences in capacity were measured by an error rate-type amount, that is, changes in behavior and changes in the amount of time needed to perform the task. Bromley (1974, p. 161)presents these experiments: (1) In one such experiment, subjects attempted to match the position of an object with the position of a pointer on an adjacent display. Older subjects were slower, making about half as many

attempts in a given period of time as did younger people; (2) In another experiment, subjects were asked to trace numbers with a metal stylus. Older people required more time but made fewer errors. Welford (1958) suggested that the slowing in behavior was due not to a desire for increased accuracy but to the progressive degeneration in perceptual mechanisms which help control movement. Physiological degeneration in the central nervous system due to age leads to the restriction on a maximum level of performance (Eisdorfer and Wilkie, 1977, p. 251; Botwinick, 1973). The Nuffield studies thus tend to confirm the notion that the elderly seem to have inadequate reserves to cope with production situations requiring continued physical stamina and extended conditions of environmental stress which may weaken the reserve capacity of the organism and the ability to respond (according to Eisdorfer and Wilkie, 1977).

Murriel and Griew (1965) replicated some of the earlier Nuffield studies using telephone operators as test subjects for evaluating capacity of different age groups to process information. Their results were in conformity with those of Welford (1958). The perceptual motor performance of older subjects was substantially worse than that of younger ones.

Although functional job performance decreases with age because perceptual and motor capacity decrease with age, Laufer and Fowler (1971) argued that most jobs do not demand physical strength equal to the capacity of the elderly. Laufer and Fowler conclude, therefore, that the productivity gap between older and younger workers is significantly narrower than might be expected.

Kunze (1976) studied the age distribution of jobs in an aerospace company. He found that 58 percent of the technical factory and managerial occupations had workers aged 63-68 years. He could identify little if any differences in job performance between those older workers and any others.

Many have argued that the reason for the ability of the elderly to keep up relates to their accumulated experience. Comparing the performance level of older and younger workers in firms producing consumer goods, Schwab and Heneman (1977) were able to show that older workers were neither more nor less productive than their younger counterparts, regardless of their accumulated experience. It would seem from their report that the older workers continue to be productive. (Low performers among the aged tend to quit their jobs).

Similar results were found for public employees in New York State agencies (Survey, 1972). This state report concluded that job performance in the group over 65 was about equal to, and sometimes noticeably higher than, younger workers in similar technical and administrative jobs.

When considering the literature from a methodological perspective, one finds two types of studies: One is the opinion type survey where superiors are asked to evaluate older employees' performances. The other is the aggregate data study, where actual performance of older workers is measured by production, attendance and safety records.

With regard to the survey studies, performance ratings of older workers tend not to be significantly different from those of younger workers. It appears that working conditions and individual conditions, not accumulated experience, seem to compensate for any decreased output

which may be identified.

In the case of the hard data studies, the major emphasis is on decline. One finds a consensus that the per-unit decline in productivity for the elderly is due primarily to reduced speed of performance. Many compensating features, along with accumulated experience, however, help to mitigate this situation. Broadly speaking, the greater the worker's skill, competence and experience, the smaller the decrease in productivity with advancing age.

There are considerable differences among industries and jobs, but comparative data is lacking in the literature on aging for various types of industrial occupations. Moreover, unified definitions of the "elderly" as well as "productivity" are also lacking, thus not permitting inter-study comparisons.

In the next section, attention is turned to the related question of workers' age, absenteeism, turnover, accidents and injuries.

C. Absenteeism, Turnover, Accidents and Injuries

M. D. Kossoris (1948) analyzed the six-month work records of 17,800 workers with regard to absenteeism and work injuries. He found that the absenteeism rate for the 60-70 year olds was about the same as for the younger cohorts.

Kossoris' (1948) data concerning the frequency of the rate of injuries also showed similar results. An injury was defined as being disabled for at least one work shift. Rate of disabling injuries per worker in the age bracket of 55-59 was about the same as that for 45-49 group, whereas the highest injury rate occurred for the group between 35-44 years of age. Underscored in this study, however, was the finding

that the relative severity of injuries was much higher for older workers, who tended to be disabled longer once they were injured. For example, a disabled worker, between 45-59 years of age lost from 16 to 19 days per disability, while an injured worker between 30 and 39 years lost between 6-1/2 to 9 days. Regarding non-disability injuries, the data showed a steady decrease with age, reaching the lowest level for age group 70-74.

Behrend (1951), in contrast to Kossoris, found that absence for all types of workers increased sharply above the age of 50. But Behrend (1959), in her review of voluntary absence, indicated that the evidence connecting age and absenteeism is conflicting.

Liddel (1954) in part confirmed Kossoris when he noted in a study of coal miners that the younger miners lost more time voluntarily than did the elderly. Likewise Kahne, et al. (1957), found the absence rate to decrease with age in the food processing industries. When absence is distinguished by cause, Griew (1964) indicated that the elderly nevertheless have a higher level of sickness absences than the younger workers. The studies of De La Mare and Sergean (1961), Cooper and Payne (1965), and Porter and Steers (1973) support the assumption that absence due to sickness increases with age.

Hedges (1973) determined whether duration of absence varies with age. He found that full week unscheduled absences were higher for older workers. Single day unscheduled absences, however, decreased with age and were highest for the younger workers.

In a later study by Hedges (1977), absenteeism was distinguished by age and by type of absence. The data indicated that illness and injury

absences were higher for older workers over 55, whereas personal and civic absences were lower for the older workers. For women, in contrast, absence due to illness was lower for those aged 55 than for those 25-34.

Bartley (1977) studied absenteeism in a large food processing plant and found a different picture. Older workers had better attendance records, better health records and less injuries than younger workers. Bartley, therefore, argued that with proper job placement, a company can take advantage of older workers' stability, more serious attitude toward work and mature judgment, to improve attendance problems all around. This seemed to confirm the early work of Kossoris (1948).

On balance, the studies of the relationship between absences due to accidents and injuries and age are the most controversial. Palmer and Brownell (1939) eliminated two separate analyses in which the accidental injury results were contradictory, in the one case decreasing, and, in the other case, increasing with age. Griew (1964, p. 15) pointed out some studies which have showed decreases in accidents with age and some studies which have indicated increases in accidents with age.

Tiffin and McCormick (1968) concluded that the accident rate was higher among the younger more inexperienced employees, after analyzing some additional studies which showed a noticeable drop in disabling injuries with age.

Van Zelst (1954) also concluded that accident rates tended to be higher among younger persons. His data obtained in a sheet tin mill showed a drop-off in the accident rate with the age of employees and their years of service on the present job. There was a continuous decrease in hospital

visits with increasing age and job experience.

In addition, Riley and Foner (1968) state that substantial research suggests no general rise in injuries among older workers, although age patterns in accident rates vary with the type of work examined. Among manufacturing workers, those beyond age 45 seem to have more favorable records. Accidents preventable by judgment tend to decrease by age, whereas those preventable by rapid response to sudden events tend to increase with age (Bromley, 1974). On the matter of safety, McFarland (1973) cites the evidence that older drivers tend to have better safety records than the younger ones. A study of bus drivers in the London Transportation System relating age and length of experience in the company to accidents found the safest group to be 60-64.

In comparing the accident and injury rates of older and younger workers, one may find that the accident rate of older workers is lower partly because some selective factors eliminated the older worker prone to accidents from hazardous jobs.

Several explanations for the trends have been suggested. One may infer that the younger workers are placed on the more hazardous jobs and that, as they become older, they try to be transferred to jobs of greater relative safety. Also, it has been argued that the younger employee is less cautious and more likely to take chances. Van Zelst (1954) refers to the immaturity of younger workers.

Regarding labor turnover, most authors agree that it decreases with age. It is generally known that older people normally do not change work and occupations if they are not forced to do so. Griew (1964) indicates some studies report tremendous decreases of labor turnover or

separations with age. Specifically, he emphasizes Speakman's (1956) study which showed a decrease in turnover of about 10 percent per decade from the twenties to the early sixties. Forssman (1957a, 1957b, 1962) studied turnover in Swedish industries, and showed that all male employees over 60 and all female employees over 55 formed a stable population with low turnover. When time of employment was related to age, it was found that male employees 60 years old obtained their employment in the same factory, on the average, at the age of 33. The corresponding figure for the female employee of 55 was 43.

According to Forssman (1962), Hyden, et al. (1951) indicated in their study which was conducted in Sweden that labor turnover decreased rapidly with increasing age, especially over 45 and in larger factories. Additionally, Forssman (1962) shows that there was a certain occupational mobility among older workers in the same factory for reasons of health but these changes within the same place of employment were not included in the studies on labor turnover.

Riley and Foner (1968) state that the older worker is likely to remain on the job up to retirement. In general, the pattern that older workers have longer job tenure than younger workers prevailed for every industry, for different occupational groups and for varied occupational levels (O'Boyle, 1975). Porter and Steers (1973) reviewed a number of studies which demonstrated a strong negative relationship between age and turnover.

An inescapable conclusion can be drawn from the studies of absenteeism, accidents and injuries, and turnover; namely, that labor

turnover decreases with age (Porter and Steers, 1973). But the results of studies of absenteeism, accidents and injuries are so contradictory, that it is possible to assume that they depend upon the type of job, kind of workers, conditions and industry, etc. which act as moderating variables between age of the employee and the effects on absenteeism, accidents and injuries.

D. Willingness to Retire

Attention is now turned to the problem of the retirement decision.

Parnes and Nestel (1975) studied early retirement using multivariate analysis techniques to assess the economic and psychological determinants of retirement. According to their study, expected retirement income assumes special importance. For example, among employed men with incomes of $600 or more per month, and other things being equal, such as health and job satisfaction, those who were eligible for early retirement benefits were two times more likely to choose early retirement than those employees who were not eligible for any early retirement benefits. Parnes and Nestel add that the retiree's commitment to the work ethic is important in this decision as well. The greater the commitment to work, the lesser the expectation of early retirement. These findings conform to those reported by Barfield and Morgan (1969). They concluded that financial factors, such as expected retirement income, were of principal importance in the retirement decision, with attitudinal variables having less influence.

Although the individual's willingness to retire may be closely related to his financial situation, there is a complex interrelationship

between income, educational level, occupational status, and attitudes toward retirement, which have to be analyzed in the retirement decision. For example, workers at the higher occupational and educational levels, who have higher post-retirement earnings, may tend to have more favorable attitudes toward retirement, but they also might find their jobs more interesting and, therefore, may tend to be less willing to retire. In line with these premises, Riley and Foner (1968) found that people committed to their specialization do not seem to seek retirement; nevertheless, workers in lower occupational levels, having smaller post-retirement incomes, also do not readily favor retirement.

Jacobson (1973) considered the role of the physical requirements of a job in voluntary retirement decisions. He hypothesized that a worker's willingness to retire would vary according to the severity of the job demands and the degree of strain caused by physical working conditions. Jacobson's sample consisted of 145 British male factory operatives, aged 55-64, selected at random from three medium-sized firms engaged in the manufacture of (1) furniture, (2) motor components, and (3) telecommunication equipment. The investigator created a Rest Allowance Index (RA) to measure the magnitude of various stress factors in different jobs. He then classified them as heavy, moderate and light stress jobs.

It was found that workers in the heavy job stress category were twice as likely to retire at the customary age as were the workers in the light category. It was also shown that the heavier the stress on the job, the higher the proportion of men who thought that the retirement age should be below the pension age.

E. Impairment of Cognitive Functioning

Research pathologists interested in gerontology have focused on age related changes in cognitive functions such as intelligence, perception, learning, memory and attention. Much of this research has been applied to the problem of how these processes are altered as a function of age in normal persons. More emphasis has been given to the pathology of the old rather than to the normal decrease in efficiency of cognitive functioning of the aged. Eisdorfer and Cohen (1978) discriminate two categories of cognitive diseases for clinical purposes: (1) non-reversible conditions such as senility due to neuronal degeneration or cerebrovascular problems, and (2) reversible conditions such as depression and acute brain syndromes. The authors state that the prevalence of cognitive disorder occurs more frequently with advancing age over 60.

The development of knowledge concerning the character and course of psychopathology in the aged population and new therapeutic interventions will help to prolong the productive life of the growing amount of elderly workers.

F. Biological and Psychological Aging

In this society, the word aging connotes sadness, misfortune, obsolescence and other bad feelings that the physical capabilities are decreasing and the particular person is losing something of his core. Sarason (1977) emphasizes that the psychological feeling of aging comes into existence when the individual is faced with the conviction that his time is limited and that he or she is sooner or later subject to death. Further, aging entails the fear of stagnation and decline, and anxiety about an uninteresting and limited future.

Aging is a process of many years' duration. Before World War II, one could distinguish physical decline as a phenomenon of later life. But during World War II, many young people in the armed forces were found to be sick and in need of surgery or special treatment. As a result, it became evident that many of the physical conditions of aging were already well developed long before they constituted an open problem. Old age can only be understood as a whole, because it is not solely a biological, but a psychological and cultural fact as well.

CHAPTER III

HYPOTHESES

There are two distinguishable task types which can be found in many industries: A) tasks demanding speed and agility, and B) tasks demanding skill and experience. Hypotheses regarding the relationship of age and productivity, absenteeism, accidents and injuries, and turnover will be presented within each major job task. In addition, the effect of selected moderating variables on the hypotheses will also be considered.

A. Hypotheses concerning job tasks requiring speed and agility.

Hypothesis I. The older the worker, the less his productivity on job tasks requiring speed and agility.

Rationale: Welford (Welford and Birren, 1965, p. 17) indicates that reduction in speed of performance takes place with increasing age, although the manifestation of this slowdown takes various forms and individuals differ greatly in their patterns of slowdown with age. Welford (1977) gives the following reasons for slowing with age: three reasons are of physiological origin, including (1) reduced signal-to-noise ratio in the brain, (2) slowing of electroencephalogram rhythm, and (3) cardiac insufficiency, and three reasons are of psychological origin, including (4) difficulty in manipulating data mentally, (5) difficulty in monitoring of response and (6) increased caution. These explanations are not mutually exclusive.

Hypothesis II. The older the worker, the greater his rate of absenteeism on job tasks requiring speed and agility.

Rationale: Studies of absenteeism due to illness demonstrate an overall increase with age (Griew, 1964; DeLaMare and Sergean, 1961; Cooper and Payne, 1965; Porter and Steers, 1973).

Hypothesis III. The older the worker, the greater the rate of accidents and injuries on job tasks requiring speed and agility.

Rationale: Older people are more liable than younger people to come to harm in the presence of hazards due to stumbling, tripping and sudden losses of balance. This is tied to an increased liability to make inaccurate perceptual judgments and to a general slowing of responses. Regarding injuries, Kossoris (1948) stated that the relative severity of injuries is much higher for the older age brackets, and they tend to be disabled longer once they are injured.

Hypothesis IV. The older worker is equivalent to the younger worker in the rate of voluntary turnover on job tasks requiring speed and agility. (Voluntary turnover excludes retirement and leaves of absence due to illness).

Rationale: Regardless of the job type, the older worker will not readily leave a job for fear that on the open market he or she will be at a comparative disadvantage because of age, especially in jobs and tasks requiring agility and speed. Forssman (1962) and Riley and Foner (1968) reported on the older worker's job stability and loyalty and, in their review, Porter and Steers (1973) presented a number of studies demonstrating strong negative relationships between age and labor turnover.

Although older workers appear to be more stable than younger workers, the investigator has chosen a more moderate position, postulating equivalent turnover rates among both younger and older workers.

B. Hypotheses concerning job tasks requiring skill and experience.

Hypothesis V. The older worker is equivalent to the younger worker in productivity on job tasks requiring skill and experience.

Rationale: Welford (Welford and Birren, 1965, p. 17) explains that older workers build up routines and strategies based upon experience, and these steps enable them to perform tasks more efficiently and to compensate for their reduced speed. Muriel and Griew (1965) suggest that experience gained over years of work can very often replace fully the decrease in biological capacity. Similarly, Sheppard (Binstock and Shanas, 1977, p. 296) states that experience can compensate for decrement due to old age.

Hypothesis VI. The older worker will be equivalent to the younger worker in rate of absenteeism on job tasks requiring skill and experience.

Rationale: There are studies which have shown that absenteeism increased with age, while others found that absenteeism decreased with age (Brownell, 1939; Griew, 1974). In the specific context of skill jobs, it is believed that absenteeism will not differ among age groups.

Hypothesis VII. The older worker will be equivalent to the younger worker in rate of accidents and injuries on job tasks requiring skill and experience.

Rationale: Jobs requiring skill and experience do not expose workers to the need for rapid and evasive movements as is true for speed jobs.

Hypothesis VIII. The older worker is equivalent to the younger worker in the rate of voluntary turnover on job tasks requiring skill and experience. (Voluntary turnover excludes retirement and leaves of absence due to illness).

Rationale: According to Porter (1973) and Griew (1964) labor turnover decreases with age. The older worker prefers to stay on his job because his whole human capital is already engaged in the effort due to his experience and knowledge achieved during many years of work. As with Hypothesis IV, the investigator has chosen to take a conservative stand, predicting equivalent turnover among younger and older workers.

The investigation will also explore the moderating effects of sex and race upon the eight hypotheses presented above.

CHAPTER IV

METHOD

Selection of Industry

Garment manufacturing is a light industry with many plants located in the New York Metropolitan area. There are a large number of job types in this industry ranging from those which are primarily speed-oriented to those which are primarily skill-oriented (See Appendix A for the most important speed and skill jobs in the garment industry).

In addition to the benefit of geographic accessibility and varied job tasks, the investigator received assurance of physical access to the plants from an official of the International Ladies Garment Workers Union (See Appendix B for letter of commitment from the Director of the Management and Engineering Department, ILGWU).

Selection of Plants

The investigator, in conjunction with the union representative and the Association of Plant Managers, selected fourteen metropolitan area plants for inclusion in the study.

Selection of Worker Sample

During July and August, 1979, the investigator visited the fourteen plants that had been selected, gained access to their files and

records, and accumulated relevant data for nearly 1,000 cases. The on-site visits made it soon apparent that each plant differed in its physical working conditions, its population characteristics, and in its management orientation toward the workers. Further, the data bank was inconsistent from plant to plant; there were serious information gaps at some organizations and, in some cases, the data was of questionable reliability.

Preliminary analyses of the available data revealed wide variations in the characteristics of workers at specific plants, such as mean age, proportion of males and females, as well as the proportion holding speed and skill jobs. It became apparent that aggregating data from individual plants to form one large group of speed workers and another large group of skill workers would lead to gross confounding of results. Because these methodological flaws were deemed to be too serious to ignore, the investigator concluded that the sounder approach would be to concentrate on one representative plant with a sufficiently large population of workers holding speed and skill jobs, for whom well-kept records were available. One plant, located in New Jersey, met these refined criteria, and it was selected for the study.

Data Collection

The investigator spent the Fall of 1979 collecting all available data from the selected plant. A number of sources were utilized. The Personnel Division maintained files which contained the worker's name, time clock number, date of birth, year hired, and craft code number indicating the type of job held. Race was ascertained from photos affixed to the personnel files; where racial designations were uncertain, the

investigator consulted with the job supervisors. Ethnic background was difficult to determine and was, therefore, dropped from consideration.

A second set of files was located in the Payroll Division. These files contained the worker's time clock number, earnings per quarter, and attendance record.

Reports on accidents and injuries were available in the Nursing Unit. These reports included age, sex, type of job, job experience, and working time lost.

Finally, turnover data was obtained from a special file maintained for termination. This file included information on sex, type of job, job experience, cause of termination, and date of termination.

Discrepancies were reconciled with the assistance of management and inadequate information was supplemented by consulting the general personnel files.

Designation of Speed and Skill Jobs

The plant listed nearly sixty job types. In order to assess which was a speed job and which a skill job, the investigator met with the union representative once again to analyze each job listed. Each job type was assigned a rank from 1 to 5 with regard to its speed requirements and a rank of 1 to 5 with regard to its skill requirements (See Appendix C). This dual ranking procedure was utilized in determining whether the job was primarily one in which the speed component prevailed (a speed job), or one in which the skill component prevailed (a skill job). In actuality, the jobs distributed themselves on a scale from simple tasks with speed and agility as a primary factor on one end of the continuum to increasingly

complicated tasks requiring skill and experience on the other end of the continuum.

Characteristics of the Workers

A total of 667 complete records were obtained. Of these, 212 (32%) held speed jobs and 455 (68%) held skill jobs. There were 183 (27%) males and 484 (73%) females. Further, 551 (83%) workers were white and 116 (17%) were black. Specifically, the sex by racial breakdown consisted of 402 (61%) white females, 149 (22%) white males, 82 (12%) black females and 34 (5%) black males. The demographic breakdown within speed and skill jobs is shown below:

	Speed Jobs			Skill Jobs		
	SEX			SEX		
	Male	Female	Total	Male	Female	Total
White	10	168	178	139	234	373
Race						
Black	4	30	34	30	52	82
Total	14	198	212	169	286	455

The intent of this study was to investigate the relationship between age and the dependent measures for speed jobs and for skill jobs, respectively. However, it soon became apparent that the designation "speed job" or "skill job" entailed a wide variety of disparate characteristics. For example, one specific type of speed job was held by older women (primarily white) with many years of experience, earning a moderate salary, while another type of speed job was an entry level position held by young men (both white and black) earning low salaries. Clearly, if age

were correlated with earnings under these circumstances, we would obtain a spuriously high correlation because the younger workers (men) held low salaried jobs, while the older workers (women) held higher salaried jobs. Similar difficulties arose within the skilled job categories as well.

Thus, the investigator was forced to shift the guidelines of his research design once again. He selected for study specific speed jobs and skill jobs which had the largest number of workers of a specified sex by racial mix. The following clearcut job types emerged:

1. Sewing Machine Operator: Speed Job with White Females (N = 66)
2. Examiner: Skill Job with White Females (N = 60)
3. Material Handler: Skill Job with White Males (N = 45)

None of the other job types had large enough subgroups available for testing the hypotheses.

Dependent Measures

The measures of productivity and absenteeism were drawn from the company records for the First Quarter of 1979, covering the period from December 25, 1978 through March 24, 1979. The normal work schedule was seven hours a day during a five day week which extended over thirteen weeks for the quarter. Thus, the maximum work period for the quarter was 455 hours. However, we had to exclude established holidays from the maximum as follows: Christmas Day (7 hours), New Year's Eve (3.5 hours), New Year's Day (7 hours), and Washington's Birthday (7 hours), which came to a total of 24.5 holiday hours subtracted from 455, leaving 430.5 potential working hours for the first quarter of 1979.

A. Productivity: Hourly piece rate wages earned during the first quarter 1979.

B. Absenteeism: Hours absent during the first quarter 1979.

The investigator returned to the plant in February, 1980 in order to obtain the remaining data on accidents and injuries and turnover for the calendar year 1979.

C. Accidents and Injuries: Number of accidents and injuries reported during calendar year 1979.

D. Turnover: Voluntary separation from the work force during calendar year 1979.

Data Analysis

Records were available for almost all of the subjects included in the subgroups selected for the study. Because the data was representative of nearly the entire population, analyses based upon sampling statistics were deemed to be inappropriate. Purely descriptive measures were utilized, such as Pearson product moment correlations between age and the four dependent variables. In addition, age data will be presented in a grouped frequency distribution format, with all means for productivity and absenteeism, and all frequencies for accidents and injuries and turnover.

CHAPTER V

RESULTS

The occupational specializations of operator, examiner, and material handler will provide three independent means of evaluating the hypotheses set forth above.

1. Speed Job. Sewing machine operators were employed in a task requiring high speed and moderate skill. At this plant, records were available for a subgroup of 66 white female operators. Their average age was 57, with a standard deviation of 7 years.

A. Productivity. Table 1 presents the number of operators in each age interval who were on the payroll during the quarterly work period under investigation. Mean hourly piece rate wages are shown within each age category. The overall piece rate wage for this group of workers is $5.53 per hour, and the standard deviation is $0.91. The Pearson product moment correlation between age and hourly rate is -.21, a low negative relationship. There appears to be a tendency toward decreasing earnings with increasing age. This gives limited support to Hypothesis I which predicts lowered productivity for the older worker in speed jobs. The need for caution in interpreting the results is made evident when one considers that age accounts for only 4% of the total variance in wages (r^2).

B. Absenteeism. Table 1 also contains the absenteeism data for the operators. The average operator was absent 55 hours during the quarterly

Table 1

Hourly Piece Rate Wages and Hours Absent Within Age Categories During a Quarterly Work Period for White Females in a Speed Job (Operator) and Correlations of Age With Hourly Rate and Hours Absent

	Speed Job: Operator (N = 66)		
Age Category	N	Hourly Rate ($)	Hours Absent
Under 25	0	----	---
25 - 34	1	5.61	41
35 - 44	3	5.65	18
45 - 54	13	6.07	63
55 - 64	46	5.35	55
65 and Over	3	5.86	48
TOTAL	66	5.53	55
		r = -.21	r = -.09

work period, and the standard deviation was 8 hours. The distribution of mean hours absent is presented for each age category, and the correlation between age and absenteeism is -.09. Clearly, there is no relationship between age and absenteeism. Hypothesis II, which predicts higher absenteeism with increasing age, for workers employed on jobs requiring speed and agility, is not supported.

C. Accidents and Injuries. There were no accidents or injuries reported for the operators during calendar year 1979. Hypothesis III predicts a higher rate of accidents and injuries with age, for those holding speed jobs. At the very least, the results are indeterminate; at most, the absence of injuries among the older operators disconfirms the hypothesis.

D. Turnover. During calendar year 1979, only four terminations were recorded for operators. All four workers, in their early sixties, left for retirement. Because retirement is excluded from the definition of voluntary turnover, we are left with no turnover for younger or older operators. While this finding may be indeterminate, it may also confirm Hypothesis IV which predicts equivalent turnover rates for younger and older workers in speed jobs.

2. Skill Job. Quality control examiners inspected finished garments and rated them in accordance with standards established by the company. The job required a slight amount of speed and moderate skill. Thus, the positions of operator and examiner were relatively close in skill level, while differing essentially in speed. Once again, data was available for a large group of white females. There were 60 examiners in this subgroup and they were slightly younger than the operators; their average age was 49 (S.D. = 13).

A. Productivity. Table 2 presents the mean hourly rates earned by different age groups during the quarterly period. The overall rate is $5.69 per hour (S.D. = $1.72), and the correlation between age and earnings is .29, a low positive relationship. Apparently, there is a tendency toward increased earnings with age. Hypothesis V predicts equivalent productivity across ages for those workers holding skill jobs. Therefore, the findings not only support the hypothesis, but demonstrate that older workers may earn even higher rates.

B. Absenteeism. Mean hours absent for examiners in each age group are found in Table 2. The average time absent is 110 hours (S.D. = 12), and no relationship was found between age and absenteeism (r = -.05). This confirms Hypothesis VI which predicts equivalent absenteeism rates across age level for skill workers.

C. Accidents and Injuries. No accidents or injuries were recorded for the examiners during the calendar year. While the results may be inconclusive, they nevertheless do not challenge Hypothesis VII which predicts equivalent injury rates across age.

D. Turnover. Three terminations were reported during the calendar year; these were examiners in their mid-sixties who retired. These cases were excluded from the tally, and no other terminations occurred. While zero turnover may be indeterminate, nevertheless, it is consistent with Hypothesis VIII which states that younger and older workers in skill jobs will have equivalent turnover rates.

Table 2

Hourly Piece Rate Wages and Hours Absent Within Age Categories During a Quarterly Work Period for White Females in a Skill Job (Examiner) and Correlations of Age with Hourly Rate and Hours Absent

	Skill Job: Examiner (N = 60)		
Age Category	N	Hourly Rate ($)	Hours Absent
Under 25	6	5.13	148
25 - 34	4	5.08	112
35 - 44	5	4.60	122
45 - 54	16	5.72	97
55 - 64	27	5.99	108
65 and Over	2	6.92	102
TOTAL	60	5.69	110
		r = .29	r = -.05

3. Skill Job. Only one other occupation, material handler, had a large enough N to enable the investigator to test the hypotheses. Material handlers must have some familiarity with the fabric they handle and are responsible for delivering cloth to cutters, operators and stockworkers. The position requires minimal speed and slight skill, and is designated a low level skill job. This subgroup is composed of 45 white males with an average age of 29 (S. D. = 14). Thus, the third group is distinct from the first two; it consists of young men performing a low level job.

A. Productivity. The mean piece rate wages are presented in Table 3. On the average, the material handlers earned $4.54 an hour during the quarter (S. D. = $0.89). The correlation of age and hourly rate reached .48, a moderately high positive relationship. Although Hypothesis V states essentially that the older workers will hold their own compared to younger workers, nevertheless, the older men have higher earnings than the younger men. This is supportive of the intent of the hypothesis.

B. Absenteeism. Table 3 contains the distribution of mean hours absent. The average time absent is 79 hours (S. D. - 9), and the correlation between age and absenteeism was -.35, a low to moderate negative relationship. While Hypothesis VI predicts equivalent absenteeism rates across ages, older workers have lower rates than younger workers. This conforms with the intent of the hypothesis.

C. Accidents and Injuries. Fifteen injuries to material handlers were reported in calendar year 1979. The accident reports did not contain information on [illegible]. Therefore, the injury data referring to all male material handlers was compared to all male material handlers employed during

Table 3

Hourly Piece Rate Wages and Hours Absent Within Age Categories During a Quarterly Work Period for White Males in a Skill Job (Material Handler) and Correlations of Age with Hourly Rate and Hours Absent

	Skill Job: Material Handler (N = 45)		
Age Category	N	Hourly Rate ($)	Hours Absent
Under 25	28	4.20	106
25 - 34	9	4.88	46
35 - 44	0	----	---
45 - 54	3	5.36	0
55 - 64	4	5.47	26
65 and Over	1	4.77	0
TOTAL	45	4.54	79
		r = .48	r = -.35

the quarter. Table 4 presents the number of injuries as a percentage of the number of workers within younger and older age categories. The injury rate was 32% for material handlers 34 years old and younger, while it was 30% for workers over 35. These results clearly confirm Hypothesis VII.

D. Turnover. Table 4 contains the turnover data for material handlers covering the 1979 calendar year. Racial data was unavailable in the termination file, so the presentation format was similar to that for injuries. Prior to the analyses, five younger workers who had been fired were removed from the analyses, as well as one older worker who retired. It was found that 35% of the younger workers had voluntarily terminated, while none of the older workers had terminated. Hypothesis VIII predicts equivalent turnover rates across ages, but the findings conform to, and even exceed, the intent of the hypothesis.

Table 4

Number of Males Employed in a Skill Job During a Quarterly Work Period Serving as a Base for Percentage of Calendar Year Injuries and Turnover Within Age Categories

Skill Job: Material Handler

	Employed	Injuries		Turnover	
Age Category	N	N	%	N	%
Under 25 - 34	37	12	32	13	35
35 - 65 and Over	10	3	30	0	0
TOTAL	47	15		13	

CHAPTER VI

DISCUSSION

The subgroups included in the study (operators, examiners, and material handlers) provide us with three independent tests of the hypotheses under investigation.

Older women working as sewing machine operators tended to earn less on a piece-rate basis than younger women. This supports the decremental theory of aging which emphasizes reduced speed of performance in the older worker. Further, as predicted, there were no age differences in turnover rate. Clearly, the aging worker in a speed job would not leave voluntarily to face an uncertain reception in the open market.

The expectation that older workers in speed jobs would have higher absenteeism rates was not confirmed; attendance records equalled that of the younger workers. In fact, absenteeism was generally low for the operators as a whole (approximately 6 days).

The average age of the women was 57, which means that many are less than five years away from retirement. We can attribute their good attendance rates to the fact that the women are typically family oriented, they need money, and would be reluctant to lose their income prior to retirement. Further, the operators have been with the company for many years and have known each other for a long period of time; they share deep friendships and company loyalty, and look forward to coming to work.

The prediction of higher accident rates in speed jobs also lacked support; the safety records of older women matched that of the younger women. Although decrements in sensorimotor skills are expected with age, obviously their abilities in working with the machines have not flagged.

The kinds of decremental effects one will find are most likely specific to the demands of a particular job.

The hypotheses proposed for skilled jobs anticipated equivalent levels of productivity, absence, injury and turnover across age groups. With regard to the position of quality control examiner, all predictions were confirmed. In fact, the older women in this skill job tended to perform better than the younger women. Perhaps years of experience gave these women the edge.

Although there were no age-related differences in absenteeism, the rate was relatively high for the group as a whole. In fact, the rate for examiners was twice as high as that for operators (16 days as compared with 8 days). The salary rates were similar for both groups, but, on the average, the examiners were younger (13 years from retirement). The company management indicated that it tended to find higher absenteeism rates among workers who were further away from retirement, even when they had been with the company for many years.

The outcomes for those working as material handlers also confirmed the four hypotheses proposed for skilled jobs. The fact that a different subgroup (younger males) also supported the predictions gives additional backing for the thesis.

Older men earned more and were absent less than the younger men. Further, an injury rate of three out of ten was found for both age groups, and turnover was reported for the younger material handlers, but not for the older men.

The findings must be interpreted in light of the job requirements. Material handling is physically demanding work, the pay scale is low, and the accident rate is high. Given the conditions of employment, it is not surprising that the young men tend to be absent more, and, if they are not fired, that they soon leave to find better jobs. Clearly, the younger men are more flexible in seeking other employment opportunities, while the older men are more limited because of their age.

Generally, granting the qualifications, the results tend to support the specific predictions for speed and skilled jobs. Although the investigation was limited to positions under the incentive pay system, the findings can be generalized to a large portion of production workers in the garment industry which employs more than 600,000 persons. Performance will depend upon the specific requirements of a job, rather than the age of a worker. In many cases, years of job experience can offset the physiological decrease in capacity (Welford, 1965; Muriel and Griew, 1965; Sheppard, 1977). In fact, the greater the worker's skill, competence, and experience, the smaller the decrease in productivity with advancing age (N.Y. State Survey, 1973).

Implications of Findings

Achievements in medicine have led to improved health and increased longevity. As a result, greater numbers of elderly workers have sought to remain in a productive capacity. It is industry's responsibility to find a place for such persons, for, obviously, their capability has been demonstrated. There must be improved utilization of human capital by means of rational job assignments.

Findings support the need for hiring, placement, and firing policies based upon individual merit, rather than on a straight, age-based cut-off system. Public policy and managerial policy should be directed toward evaluating every employee in terms of job effectiveness. Creating arbitrary age limits for some jobs may lead to rejection of a considerable number of older workers who can meet and even excel the performance of younger workers - with less absenteeism, less accidents and injuries, and less turnover.

If management, and society as a whole, follow the recommendations given above, it can diminish the waste of human potential, the social cost of unemployment, the psychological and material deprivation of the older worker, and lead to the improvement of the living conditions of the elderly.

On a theoretical level, the results call for a refinement of the decremental theory of aging. Only a moderate decrease in productivity with age was demonstrated for a speed job, and this was offset by worker dedication and reliability. For skill jobs, older workers demonstrated equivalent or better performances than the younger workers. Therefore, an age-related decline in activity within a light industry was not substantiated in a real work situation. The decremental hypothesis was not supported in

the present context.

Future Research

1a. First and foremost, the study should be replicated in other plants of the garment industry which have sufficiently large populations of workers with similar demographic characteristics.

1b. Because the current study was inconclusive with regard to turnover and injuries, the workers should be followed-up for long enough periods of time to accumulate the data necessary for differential analyses of accidents and injuries and turnover among younger and older workers.

2. The investigation should be extended to occupations which were not included in the original study and to other major ethnic groups.

3. We have to embark upon a comparative study of the effects of age in different levels of the manufacturing industry, i.e., comparing a light industry, a medium industry and a heavy industry.

4. We must explore the rate of retirement among companies with and without mandatory termination policies.

5. We should investigate age discrimination and the outcomes of efforts on the part of older workers to find employment.

6. We should upgrade the skills of older workers or explore the possibilities of part-time employment, and ascertain the effects of these steps upon their job market.

7. Finally, it is recommended that we engage in cross-cultural studies of the effects of age on performance.

An expanded research effort will ultimately benefit the rapidly growing population of elderly workers and the nation as a whole.

APPENDIX

APPENDIX A

Most Important Jobs in the Garment Industry (From the Dictionary of Occupational Titles, 1977, p. 1241 - 3 and in Consultation With Union Officials.)

1. Garment industry jobs requiring speed and agility:

Armhole and shoulder off presser, armhole baster, armhole baster, jumpbasting, armhole feller, handstitching machine, armhole raiser, arahole sew and trim operator, assorter, back maker, band cutter, band cutting machine operator, baster, hand baster, basting machine operator, basting puller, belt cutter, belt loop cutter, belt loop maker, belt turnover, binder, chainstitch, binder, coverstitch, binding cutter, blindstitch machine operator, boner, button-buttonhole marker, buttoner, buttonhole machine operator, buttonhole maker, buttonhole tacker,button sewer-hand, button sewing machine operator, canvas baster, jumpbasting, chainstitch sewing machine operator, cloth measurer, machine, coat draper, coat ironer-hand, coat joiner, lock-stitch coat padder, collar band creaser, collar baster, jumpbasting, collar closer, collar feller, collar fuser, collar padder, blindstitch-hem, collar stay fuser tender, collar tacker, collar trimmer, collar turner, collar turner operator, coverstitch machine operator, cuff creaser, curtain feller, double needle operator, dress draper, dress marker, edge baster, edge maker, edge stitcher, elastic attacher, elastic attacher, coverstitch, elastic attacher, elastic attacher, zigzag

machine operator, elastic cutter, elastic tape inserter, emblem fuser tender, embroidery machine operator, fabric and accessories estimator, facing baster, facing cutting machine operator, facing slitter, fagoting machine operator, felled seam operator, hand-finisher, flat-lock sewing machine operator, fly raiser, fly setter, folding machine operator, front edge tape sewer, front maker, fusing machine feeder, fusing machine tender, garment parts cutter, hand, garment parts cutter, garment sorter, garment turner, hemmer, hemstitching machine operator, hook and eye attacher, jumpbasting machine operator, jump iron machine presser, lining baster, lining feller, lining finisher, lining maker, lining presser, marker, multineedle chainstitch machine operator, overlock sewing machine operator, pants outseamer, piece presser, pinking machine operator, pinner, piped buttonhole machine operator, piped pocket machine operator, piping cutting machine operator, pleat patternmaker, pocket creaser, pocket flat creasing machine operator, pocker marker, pocket presser, pocket setter, profile stitching machine operator, rhinestone setter, ribbon cutter, safety stitch machine operator, seam presser, seam steamer, seat joiner, semi-automatic machine operator, sleeper and presser, shell maker, lockstitch smocking machine operator, steaming cabinet tender, thread pulling machine attendant, top collar maker, topstitcher-lockstitch, topstitcher-zigzag, trimming cutter, trimming finisher, trimming machine operator, trimming sewer, automatic machine operator, tunnel elastic operator-chainstitch, tunnel elastic operator-lockstitch, tunnel elastic operator-zigzag, ultrasonic sewing machine operator, semi-automatic machine

operator, undercollar baster, undercollar maker, underpresser, hand presser, vest front presser, vest presser, zigzag machine operator, zipper setter.

2. Garment industry jobs requiring skill and experience:

Alteration tailor, appliquer zigzag, assembler, clothing pattern preparer, cloth shader, coat baster, coat tailor, collar feller, collar setter-lockstitch, collar setter-overlock, cuff setter-lockstitch, cuff setter-overlock, custom tailor, cutting inspector, draper, dress draper, dressmaker, duplicate maker, hand feller, final assembler, finished garment inspector, lining setter, lockstitch complete garment operator, overlock complete garment operator, pattern grader-cutter, patternmaker, piece-goods buyer, repair operator, sample cutter, sample stitcher, top collar baster, utility operator-lockstitch, waistband setter, lockstitch waistline joiner, overlock waistline joiner, lockstitch zipper setter, hand-pressing finished garment, machine pressing finished garment, pattern making, pattern grading, making markers, sample marking, material handler.

APPENDIX B

January 25, 1978

THE DOCTORAL COMMITTEE
OF BUSINESS,
N.Y.C., N.Y.

To whom it may concern:

This is to confirm my willingness to assist Mr. Joseph Eisenberg in his research on productivity and related problems of older workers. I understand he needs the necessary data in connection with his work on Ph. D. dissertation.

Sincerely yours,

Mitchell Lokiec

Mitchell Lokiec
DIRECTOR MAN. ENG. DEPT.

ML/gt

APPENDIX C

Dual Ranking Procedure for Assigning Speed and Skill Designations

CRAFT NAME	CRAFT CODE		
	CODE #	SKILL	SPEED
Operator	01	3	4
Clipper	02	1	4
Floor Girl, Utility Girl	03	1	2
Looper & Cleaner	04	1	4
Checker	05	2	1
Wire Former	06	3	2
Inspectors	07	3	1
Hot Press	08	2	1
Elastic Stretcher	09	2	1
Sample Makers	10	4	2
Remnant Rollers	11	2	1
Gadget	12	2	1
Material Handlers	13	2	1
Stapler	14	1	2
Salvage	15	2	1
Pressers	16	2	1
Examiners	17	3	2

CRAFT NAME	CODE #	SKILL	SPEED
Pre-Ticker	18	1	2
Stampers	19	2	1
Return Stock	20	2	1
Bar-Tack	21	1	2
Spray Gun	22	1	2
Labels	23	1	2
Pin Ticket	24	1	2
Bra Bar	25	1	2
Hangering	26	1	2
Stock Clerk	27	2	1
Preparer	28	3	1
Expediter	29	3	1
Shortages	30	3	1
Marker	31	5	2
Standard Checker	32	3	1
Ozalid	33	2	1
Cutter	34	5	3
Stretcher	35	4	3
Damage Repair	36	2	1
Pattern Girl	37	3	2
Ticket Preparer	38	3	1
Clerk Factory	39	3	1

CRAFT NAME	CODE #	SKILL	SPEED
Assorter	40	3	1
Sizers	41	2	1
Label Hanging	42	2	1
Material Handlers who Drive	43	2	1
Singles	44	2	1
Consolidation	45	2	1
Sweepers & Matrons	46	1	2
Drivers	47	4	3
Standard Checker	48	4	2
Machinist	49	3	2
Mechanic	50	5	3
Electrician	51	5	3
Carpenter	52	5	2
Door Elevator	53	1	2
Elevator Operator	54	1	2
Guard	55	3	1
Machine Examiner	56	4	2
Kimball Attacher	57	5	2
Management	58	5	3
Forklift Operator	59	4	2
Shipping Clerk	60	4	3
Stellar Lacing (Top)	61	2	3

CRAFT NAME	CODE #	SKILL	SPEED
Stellar Pin Ticketing (ED)	62	2	1
High-Low Std.	63	2	1
High-Low Off Std.	64	2	1
Picking Std.	65	2	1
Picking Off Std.	66	2	1
Packing Std.	67	2	1
Packing Off Std.	68	2	1
Export Packing Std.	69	3	1
Export Picking	70	3	1
Special Projects-Shipping	71	4	2
Donald Brooks-Shipping	72	4	2
Post Exchange Std.	73	4	2
Post Exchange Off Std.	74	4	2
Stellar Cleaner	75	2	1
Stellar Picking Off Std.	76	3	1
Distributor	77	4	2
Stellar Box Tacking	78	1	2
Tagging - Ed. - Sleep	79	2	1
Bagging - Ed. - Sleep	80	1	2
Hanging - Ed. - Sleep	81	1	2
Puffers - Ed. - Sleep	82	1	2
Barbing	83	1	2

CRAFT NAME	CODE #	SKILL	SPEED
Boxing - Permizia	84	1	3
Heat Sealer	85	1	3
Stickering	86	1	2
Stocktakers	87	3	2
Stylist	88	5	2
Stocktaker/Stylist	89	5	2
Secretary	90	4	2

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