

ISSUES CONCERNING RETURN TO WORK

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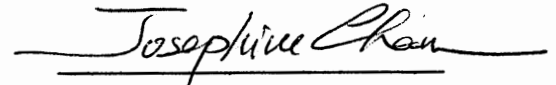
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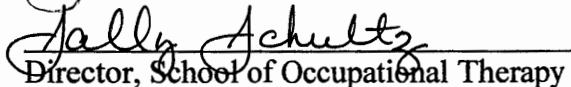
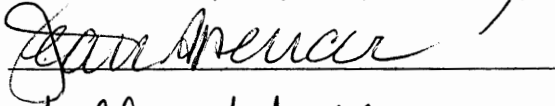
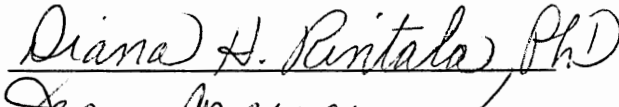
To the Dean of Graduate School:

I am submitting herewith a dissertation written by Victoria Jade Strong, MOT, OTR, CHT, entitled "Issues Concerning Return to Work." I have examined this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy with a major in Occupational Therapy.



Dr. Josephine Chan, PhD

We have read this dissertation and
recommend its acceptance:


Director, School of Occupational Therapy

Accepted:


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ABSTRACT

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ISSUES CONCERNING RETURN TO WORK

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Issues concerning return to work following a work-related injury can bring about multiple obstacles the worker may face. The phenomenon of adaptation with return to work emerges from complex interactions between the worker and environment. Understanding these interactions with return to work after injury may have an influential effect with workers. Meyer (1922) symbolized the primary premise of occupational therapy by the “value of work” and “problems of adaptation”. The injured worker experiences a disruption in his/her everyday work requiring an adaptive response in which to deal with this disruption. This process from the time of injury until return to work is an ongoing adaptation process. This line of research explores the various issues regarding returning to work including the worker’s environment and adaptation strategies used during the process.

Chapter one simply states the problems and specific aims of the dissertation. Chapter two reviews general issues with return to work after a work-related injury. It serves as a general introduction for return to work issues and a background for the theoretical and empirical work that follows. The third chapter focuses on the social work environment and its role with return to work. The social work environment is

conceptualized in terms of relationships, pressure, and structural factors within the environment. All subsystems are reported as strong influencing factors with the worker's return to work.

The fourth chapter describes a study that used a mixed design involving both a qualitative and quantitative approach with a small sample. The fifth chapter describes a quantitative study of a larger sample. The focus of these two studies is primarily on the role of the environment in the adaptive process of returning to work. These studies involved injured workers in the search for adaptive strategies as well as associations that occur in the social work environment.

The significance of this work to occupational therapy lies in the importance of the "value of work" and "problems of adaptation" (Meyer, 1922). By understanding the injured worker's adaptation process and the role of the work environment, therapists can better elicit adaptation strategies. The findings are significant to other health professionals, employers and insurance companies since it identifies adaptive strategies and environmental associations with returning to work.

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CHAPTER ONE

INTRODUCTION

This dissertation addresses the notion of returning to work. It concerns both the issues of occupational adaptation and applied science in the specialty of hand therapy. The research conceptualizes the work environment, its roles in occupational adaptation and adaptive strategies that the injured worker may utilize with returning to work.

Statement of the Problems

Return to Work

Returning an injured worker back to an existing program in their work environment can be a challenging task that often coexists with numerous obstacles. These obstacles may include the injury itself, environmental aspects as well as the worker's ability to adapt. Delayed return to work not only leads to excessive absences but also large amounts of expense to the employer, insurance agencies and the worker. Large bodies of literature report specific statistics that allude to determinants of work outcome; however, there is limited research on the influence of the work environment. The physical environment has been well recognized and acknowledged in the work literature but not until recently has the social environment become an issue. To illustrate, ergonomics in the work environment has been well recognized in many work places. More and more businesses have offered more appropriate seating devices, keyboards and an overall improved ergonomic workstation to their employees. The U.S. Department of

These strategies were both industry and task specific; however, they involved changes only in the physical environment. In a filtration company that manufactured diesel engine filters, the workers were required to use an expanded pinch grip and torque their wrists to its full range of motion. This repetitive use of the upper extremity seemed to be causing carpal tunnel syndrome in the workers, which led to surgery in some cases. The solution to this problem was use of a robotic device that required no manual work from the workers. Obviously, the Occupational Safety and Health Administration (OSHA) has made tremendous gains in the prevention of work-related MSDs but the consideration of another aspect of the environment can only improve those gains. Broadening our understanding of the work environment will not only facilitate the decline of work injuries but may also improve the process of returning to work.

Adaptation Process

Occupational therapy has been symbolized by “the value of work” and “the problems of adaptation” (Meyer, 1922). Occupational therapists view the injured worker as experiencing a disruption in the everyday work that calls for an adaptive response to deal with this disruption. Adaptation in occupational therapy is conceptualized in different ways amongst theorists. The theoretical basis for this research lies in the occupational adaptation frame of reference (Schkade and Schultz, 1992) where adaptation is considered to be the desire of the worker to participate in work or occupation. It is the process by which the worker and the occupational environment interact when the worker is faced with an occupational challenge (injury) that calls for an occupational response. This response will in turn be reflected in an experience of relative

mastery (return to work). The worker's desire for mastery is a motive that is recognized by the worker and is related to achieving a higher level of performance.

When a worker is injured on the job, there is an adaptation process that he experiences throughout. Some workers have an intrinsic motivational force that leads to successful adaptation while others experience difficulty with the challenge of injury; therefore, causing disruption. Studying adaptive strategies of injured workers should offer significant insight to occupational therapists. A better understanding of adaptive strategies that workers use with regard to return to work can also be useful to employers, insurance companies as well as other workers.

Specific Aims

The purpose of this research is to explore various issues with returning to work including the worker's environment and adaptation strategies that are used in the process. This line of research is comprised of three studies with the purposes as follows:

Study 1: Synthesize current literature about the social work environment.

- A. What are the subsystems of the social environment that may be influencing factors with return to work?
- B. What is the role of relationships in the work environment?
- C. What is the role of work pressure in the work environment?
- D. How is control associated with return to work?

Study 2: Explore the essence of experiences of workers with a work-related upper extremity musculoskeletal disorder (MSD) and their adaptive strategies.

- A. Qualitative research design: What are the emerging themes or adaptive strategies found in workers diagnosed with a work-related MSD?
- B. Quantitative research design: What are the workers' perceptions of their symptoms and function after a work-related injury?
- C. How the qualitative and quantitative approaches complement each other?

Study 3: Compare perceptions of the social environment held by workers who do (non-worker) and don't (worker) take time off from work when diagnosed with a work-related MSD.

- A. Is there a significant difference between the 'worker' and the 'non-worker' and their perceptions of social support in the work environment at initiation of therapy?
- B. Is there a significant difference between the 'worker' and the 'non-worker' and their perceptions of their health and well-being (physical and emotional well-being) at initiation of therapy?
- C. Is there a significant change in perceptions of physical functioning over time (between initiation of therapy and discharge) with the 'non-worker'?

These questions will be addressed through three different research methods: conceptual review (study 1), mixed qualitative and quantitative design (study 2), and quantitative design (study 3).

CHAPTER TWO

A REVIEW OF THE LITERATURE

Issues concerning return to work after a work-related injury bring about a number of obstacles, including adaptation as an ongoing process, paradigm shift, work environment, and the occupational therapist's role. This chapter reviews relevant literature about these issues as a background for the theoretical and empirical work to follow.

Introduction

Injury to the worker can be a major source of burden to the employer and worker while leading to excessive work absence. Returning the injured worker back to an existing program in the company is an obstacle that is often associated with this adaptation process. It is considered to be a major health issue in the United States. Existing studies indicate that most injured workers get back on the job without difficulty or disability; however, a small number of workers do not recover as quickly and are responsible for much of the expense. Insurance industry statistics indicate that approximately 15% of workers' compensation claims represent failure to return to gainful employment (LWCC, 2004). In a 1998 study of 148 workers, it was estimated that men were 1-½ times more likely to return to work than were women. The chance of an injured worker returning to work decreased 20% for every decade increase in age and workers with a high level of psychological stress were less likely to return to work

(Crook, Molodofsky, and Shannon, 1998). There have been multiple studies that suggest that the speediest possible return to the workplace following an injury is usually the best for all concerned (Kunkel and Miller, 2002). Length of time away from work, psychological problems, and local labor conditions may be stronger determinants of work outcome than objective clinical variables where medical advice determines return to work. Statistics repeatedly support the notion that the quicker the employee returns, the quicker the case will be closed. Workers who have not returned to duty within 90 days of injury have less than 50% likelihood of ever returning. Workers away from work greater than 120 days have a 10% chance of returning (LWCC, 2004). The term “soap opera syndrome” has been used to describe “disabled” workers (LWCC, 2004). The longer workers are off work, the more likely they consider themselves disabled while becoming accustomed to the sedentary lifestyle and finally losing their motivation to return to work. With these numbers in mind, it would seem important to have a better understanding of the multifactorial nature of the injured worker’s adaptation process assuming that return to work is considered a good indicator of adaptation.

“Return to work” as an Ongoing Adaptation Process

Published in the first edition of the *Archives of Occupational Therapy* in 1922, Adolph Meyer symbolizes the primary premise of occupational therapy. He discusses the “the value of work”, “the problems of adaptation”, and indicates that the process of adaptive development results from “doing”, “work”, and “occupation.” In the occupational therapists view, injured workers have experienced a disruption in their everyday work and have to have an adaptive response to deal with this disruption. The

entire process from the time of injury until the worker's return to work is considered to be an ongoing adaptation process. The process also may continue even after return to work. The construct of adaptation is conceptualized in different ways amongst occupational theorists. A common and well-published theoretical concept is that of Kielhofner and Burke's Model of Human Occupation (Kielhofner and Burke, 1985). They proposed that occupational therapy's primary concern is the worker's ability to adapt to his level of occupational functioning. Adaptation is characterized by whether the worker's experience includes personal satisfaction as well as by his ability to respond appropriately to the environmental demands he experiences.

Schkade and Shultz (1992) and the committee at Texas Woman's University articulate the occupational adaptation frame of reference as the integration of occupation and adaptation constructs into one interactive construct. Adaptation is the worker's desire to participate in his work or occupation. This desire is the intrinsic motivational force that will lead to his return to work. The process of occupational adaptation is a complex one. It is the process by which the worker and the occupational environment interact when the worker is faced with an injury (occupational challenge) that will call for an occupational response that in turn will finally be reflected in an experience of relative mastery. The desire for mastery is a motive recognized by the worker that is related to achieving a higher level of performance such as returning to work.

The occupational environment demands an occupational response. The contexts of work, play and leisure, and self-maintenance are those in an occupational environment. There are three subsystems that contribute to the nature of the occupational environment.

According to Spencer (1987), these subsystems include the physical, social and cultural. The physical subsystem is made up of the nonhuman factors while the social consists of those persons who may be influencing the environment through their social attitudes, actions and predispositions. The cultural subsystem reflects the method by which the physical and social subsystems come together and consists of procedures, methods, rituals, values and the constraints of work, play and leisure, or self-maintenance (Spencer, 1987).

Role of the Environment

Physical Subsystem

The physical subsystem is the environment made up of the nonhuman factors. It can be divided into further subsidiaries including ambient factors and physical layout. The ambient factors will be reviewed in terms of lighting, sound, and temperature while the layout will be reviewed by location and arrangement (Hollahan, 1982).

Ambient Environment

The ambient environment encompasses all aspects of one's surroundings in the work setting. Light, sound and temperature are all aspects of the ambient environment. When discussing the ambient environment, characteristics of the physical environment are included. Features of the ambient environment can greatly affect human performance. When reviewing the literature for aspects of the ambient environment, visual fatigue or light may be common predictors of work-related injury.

Lighting

In recent years, lighting has come to be recognized as an essential element of workplace ergonomics. With regard to computer monitors, proper or correct lighting refers to a lack of direct and reflected glare and good character contrast on the monitor surface (MacLeod, 2000). Proper lighting can enhance the worker's comfort while improper lighting may lead to adapting with poor posture in order to cope with the inadequate lighting. When reviewing the literature for aspects of the ambient environment, visual fatigue or light are reported to be common predictors of work-related injury and can affect more than the eyes. Illumination levels and contrast are important to consider when regarding visual symptoms. When all of these conditions are adequate, visual fatigue will not be present (Gobba, Broglia, Sarti, Luberto, and Cavalleri, 1988). When these conditions are inadequate, it can cause the worker to contort his or her posture to avoid glare or to see well in dim conditions, thus causing excessive bodily stress.

In today's workplace, computers have become common fixtures and continue to grow. They provide efficiency and competitive advantages that allow work to be carried out more effectively with their use. On the other hand, computers cause jobs to be more sedentary, require more mental attention and require less physical expenditure of energy. Many jobs that require computer use have been found to be stressful (Carrajon, 1993). With the spread of the use of computers and the increase in work-related injuries, there are many studies that identify the possible causes of these health problems (Mocci, Serra, and Corrias, 2001). Computer screen design, improper illumination, work demands and

task characteristics all may lead to potential visual discomfort (Laubli, Hunting, and Grandjean, 1981). Visual discomfort leads to higher levels of stress that, in turn, has been shown as an indicator of physical disturbances (Smith, 1997).

In a study of visual fatigue in video display terminal VDT operator, VDT-induced symptoms were assessed by means of the workers' answers to a questionnaire. Results revealed a positive correlation between eye discomfort, ocular asthenopia (eye strain often accompanied by dimming vision and headache), and myopization (nearsightedness) (Gobba, et al., 1988). The results also suggest that fewer musculoskeletal symptoms may be present if the ergonomic design of the workplace and the viewing distance are adequate (Gobba, et al., 1988).

In contrast, a study of 385 bank workers found that some of the environmental discomfort factors such as lighting and temperature were not highly correlated with visual complaints. The visual complaints instead seem to be due to the lack of well-being at work, poor support from colleagues, or conflicts with colleagues (Mocci, et al., 2001). Although these results did not reveal a direct positive correlation between inadequate lighting and visual fatigue, they do show a positive correlation with social support from colleagues that will be discussed later.

Temperature

In a sub-optimal environment, human performance often deteriorates. Poor working conditions can influence the workers' health. Excessive heat or humidity can slow down activities while cold can have an effect on the efficiency at which work is performed. In a study of working conditions and health in hairdressing salons, the

authors found that poor general ventilation increased the health complaints caused by hairdressing chemicals. Effective general ventilation alleviated the air pollutant effects but unfortunately, did not completely resolve the problem. The ventilation often caused discomfort as a result of the drafts. The authors recommended a local exhaust ventilation where the chemical content in the air was the highest. According to their results, by increasing the air exchange rate up to 5-7 times per hour also improved the situation (Leino, Kahkonen, Saarinen, Henriks-Eckerman, and Paakkulainen, 1999).

A comprehensive questionnaire that assessed both physical and psychosocial work environments was administered to 133 employees. Environmental factors that were found to be most often associated with poor work environments included improper room temperature, light reflection, dust and dry air. Individuals with environmentally-related health symptoms tended to work primarily in customer support divisions and viewed their jobs as having higher work demands (Arnetz, Berg, and Arnetz, 1997). Optimizing the temperature in the work environment, may reduce the amount of stress on the worker, thus allowing for optimal work and increasing the return to work rate.

Layout

The physical setting layout may have an impact on the level and nature of social interaction between coworkers. The design of the office may determine the kinds of interactions that can take place. The layout of work settings can also affect the ease and efficiency that the overall job is carried out. A goal is to arrange spaces to facilitate the performance of the total set of activities engaged in the setting (Bennett, 1977). Two aspects of a setting is the location of environmental features and their arrangement.

When arranging features, it is be important to consider the relationship of a group of environmental features to one another in a particular area. For example, the placement of interrelated tools of assembly-line equipment in an industrial setting is important to consider (Hollahan, 1982).

In a study of physical and chemical working conditions of hairdressers, the most frequent causes of discomfort were awkward working postures due to inadequate layout and repetitive motions. Many of these discomforts caused a work-related injury in the hairdressers and made it difficult for them to return back to work due to the discomforts (Leino, et al., 1999). A standardized questionnaire sent to 471 dental hygienists revealed that physical environmental factors contribute to musculoskeletal complaints. Among these were strainful ergonomics due to the physical layout, solitary work, patient treatment hours and working hours. The author also found that musculoskeletal complaints increased significantly in several body parts with age (Ylipaa, Arnetz, Benko, and Ryden, 1997). This information may be useful as a baseline when establishing physical layout and organization of work in work environments as well as modifications required when an injured worker returns to work. By improving the physical layout as well as the organization of the work process, it cannot only create a greater workload capacity but increase the return to work rate by offering the worker organizational support.

Social Subsystem

Social environments include those persons who are present and may have an influence on the surroundings through their social predispositions (Spencer, 1987). A

theme in Bertil Gardell's work is that one's position in the social and work environment can have a huge effect on health and well-being (Gardell, 1980). A positive social environment can be a positive influence, if not a motivating factor, in the injured worker's return to work. Social environments include both informal and formal networks. Formal networks include superiors, subordinates and others (support staff). Informal networks include family and peer cohesion.

Informal Networks

It has become increasingly recognized that in order to understand how the work environment affects an individual's well being, it is also important to understand how other situations outside of work can play a role in this relationship. Within the marital relationship, the spouse or spouse-equivalent has a significant impact on boundary options. The attitudes of spouses, their views of their own work and domestic roles, and any physical or psychological problem they may have may have important implications on the constraints of work (Nippert-Eng, 1996). When a spouse has a good feel for the way his significant other's work is completed, it makes him a valued adviser and facilitates a high level of home and work integration. On the other hand, a spouse may perceive his spouse's work as being in direct conflict with their home environment resulting in spatial, temporal, and social separation from the work and home life. Children can also have long-standing issues associated with the work environment. They can consistently cause problems at home that in turn can be indirectly related to the parent's work. Problems they have can be associated with moral and financial irresponsibility that may cause malaise (Nippert-Eng, 1996).

Physically active lifestyles are often associated with improved health and quality of life. In a study from a cross-cultural environment, 3342 working adults were interviewed to assess social environmental factors. The authors found that the strongest independent predictor of being physically active was the social environment. Those who perceived low social support from their personal environment (family, friends, and workplace) were more likely to be sedentary compared to those with high social support from their social environment. Surprisingly, a supportive physical environment was not associated with participation in physical activity as strongly as had been anticipated (Stahl, Rutten, Nutbeam, Bauman, Kannas, Abel, Luschen, Rodriguez, Vinck, and van der Zee, 2001). By increasing the worker's informal social support network, the worker's physical activity may increase as well as his or her quality of life, health and finally decreasing the risk of MSDs and increasing the success of return to work.

In a representative survey of 200 employed persons examining disruptive factors in working conditions, the most frequent disruptive factor mentioned was insufficient time for family and friends (Buchberger, 1993). This disruption may not only impede the quality of the work, but may cause unnecessary stress, thus increasing the risk of injury or preventing successful return to work. Disturbing thoughts, or even pleasant thoughts, about home may now be present when the worker is attempting to return to work. His or her workplace self can be consumed by who or what he or she is at home.

Formal Networks

A strong social support network, supervisor support and workplace culture have been shown to have a positive effect on both job satisfaction and longevity (Butterworth,

Hagner, Helm, and Whelley, 2000). After a work injury, there may be other non-health related reasons for not returning to work. The worker's relationship with his or her supervisor and coworkers or his or her satisfaction with the job may play an imperative role in the injured worker's decision to return to a job (Tait, Chibnall, and Richardson, 1990).

In a 1995 study, workers with upper extremity work-related disorders were found to be angrier with their employers than non-injured workers. Poor employer- employee relationships were reflected in the high number of workers who sought an attorney (Himmelstein, Feuerstein, Stan, et al., 1995). This high prevalence of poor relationships may warrant an intervention focused on resolving these differences and improving the organizational climate. When reviewing the formal social networks, a three-year prospective cohort study found there was a positive relationship between low coworker support and chronic neck pain. Interestingly, there was no statistically significant relationship between neck pain and other work-related factors such as supervisor support. However, there was a slight increase in the relative risk with poor supervisor support (Ariens, Bongers, Hoogendoorn, Houtman, van der Wal, and van Mechelen, 2001). These are important risks to consider when attempting to facilitate a successful return to work with an injured employee

Cultural Subsystem

The cultural subsystem indicates the manner by which the physical and social subsystems unite (Spencer, 1987). The culture may help to shape many aspects of the environment including social support, working hours, and acceptability of behaviors. In

the occupational therapy Uniform Terminology, cultural environments are defined as “customs, beliefs, activity patterns, behavioral standards and expectations accepted by society of which the individual is a member.” It includes political aspects such as laws that affect access to resources and affirm personal rights, opportunities for education, employment, and economic support.” (AOTA, 1994). In the work environment context, culture refers to the shared way of the workplace in a group of workers. Many definitions of culture discuss the importance of establishing patterns of how things are done, and systems belief of what is done by particular workers (Gertz, 1983)(as cited in Spencer, 1998). The cultural environment in the workplace, can be studied at various levels including the immediate scale, proximal scale, community scale or societal scale (Spencer, 1998).

To better understand how cultural beliefs can shape how a worker interacts with his coworkers or superiors, it can be seen with a study of the immediate scale cultural environment. An evaluation of immediate scale cultural environment can be illustrated by a work-based visit focused on evaluation and intervention centered on the worker’s use of his environment in managing potential problems with coworkers or subordinates. Use of this technique may be a potential strategy for adapting the culture of the work environment to optimize occupational performance of workers (Spencer, 1998).

The concept of shared culture in the workplace has been termed “local worlds” by Arthur Kleinman (1992). An example of this concept being studied is in Dyck’s (1992) study that presented a case study of a Chinese-Canadian immigrant woman with a chronic illness. The woman’s family, community networks, and workplace shaped her

daily management of her illness. Her experiences and management decisions about her health were related to the social conditions of her life. The author finally suggests that attention needed to be paid to the environment's broader systems versus the cultural distinctiveness of the individuals when attempting to understand individual's responses.

The community scale environments are studied to examine individuals with disabilities and their life community experiences (Spencer, 1998). Literature was examined for persons living with work-related injuries in the workplace and their experiences. The "community" in this context will be that of the workplace environment. A 1991 qualitative study analyzed women's perceptions of living and working with MSDs. Fifty-two women working in telecommunications and a chicken-processing factory who had been diagnosed with a MSD were interviewed about their perceptions and experiences of their illness. Their accounts of the search for caring and treatment suggest that they felt the need to be believed in order to establish their integrity. The failure of "belief" argued that chronicity might have been the culprit (Reid, Ewan, and Lowy, 1991).

Understanding the nature of the occupational environment and its elements will provide a more holistic view of some of the obstacles that the injured worker may face upon return.

Paradigm Shift

After review of the literature, the trend with the injured worker suggests a major paradigm shift. Previous and more common rehabilitation often occurs outside of the work environment but seems to be shifting to services that take place at the actual

worksite. With the worker receiving rehabilitation onsite, the employer not only assumes more control but also is experiencing a reduction in workers' compensation claims (Shrey, 1996). In Crook's (1998) study, workers who were offered a "light-duty or modified" job were twice as likely to return to work than those workers who were not offered the modifications. It is estimated that employers save approximately \$96 for every dollar spent in rehabilitating the injured worker to return to his or her previous job tasks (LWCC, 2004). Injured workers who participated in an onsite program while receiving 100% of their wages demonstrated a reduction in overall workers' compensation costs (Shrey, 1996).

Rehabilitation programs outside of the worksite are often considered to be an obstacle when attempting to return the injured worker back to work. Much of the research suggests that by establishing an onsite return-to-work program, employers can reduce overall workers' compensation costs, avoid the costs of hiring replacement workers, reduce fraud and facilitate improved employee morale. Unfortunately, at this time, there is a lack of uniform standards when collecting outcome data regarding efficacy of different programs.

Traditional rehabilitation off the work site may include a hospital stay where therapeutic services in a limited amount are received followed by discharge and an outpatient therapy program. Finally, the injured worker may attend a work hardening program that offers a multidisciplinary team approach including physical and occupational therapy. Work hardening is a work-related individualized treatment that incorporates real or simulated work with the goals of restoring physical, functional and

vocational skills. Many work hardening programs do not focus on facilitating the worker's adaptation process.

Worksite programs offer similar services to that of the traditional rehabilitation but in the worker's familiar work environment. It is a relatively new concept of treating work-related injuries. The occupational therapist actually offers the treatment at the worksite versus an outpatient clinic or hospital. The actual job duties are incorporated into the rehabilitation with the overall goal of returning the worker to pre-injury levels.

The rehabilitation program is developed based on the physical demands of the job. Following treatment sessions, the worker's job performance is monitored with the therapist acting as a coach regarding body mechanics and injury prevention. If the worker is unable to perform his or her regular job duties, an alternate job within the restrictions is provided.

An early return to work program was initiated at The Johns Hopkins Hospital in 1992 as part of an effort to control costs of work-related injuries. A longitudinal study (10-years) was completed revealing a significant decrease (55%) in the rate of lost workdays. The return to work initiative went from an average of 0.63 per 100 employees to 13.4 per 100 employees (Bernacki, 2000).

This paradigm shift from offsite to onsite work rehabilitation is consistent with the philosophy of occupational therapy since it promotes "meaningful occupation." This shift places the occupational therapist in the optimal environment to utilize the "meaningful" tasks during the worker's adaptation process.

Occupational Therapy Role

Much of workers' sense of worth and identity stems from their occupations and their ability to provide and be productive. When this production is removed due to an injury, many injured workers experience physical limitations as well as a sense of depression.

The treatment of the injured worker includes knowledge of the workers' compensation system and coordination of the entire team. The team often consists of the treating physician, the therapists, the case manager, and the insurer and, of course, the worker. Speedy and efficacious return to work is often the central objective of the employers, worker's compensation authorities and hopefully the worker. Since the paradigm shift favors onsite work rehabilitation, this may be the primary environmental focus for the occupational therapist. The use of appropriate resources can more efficiently guide the process to achieve the outcome of return to work. The occupational therapist can often offer a unique role by having a greater and deeper understanding of the workers' experiences and adaptation process. It is important for the occupational therapist to recognize those workers most in need of assistance in the adaptive process. Particular attention should be paid to those workers who are relatively less satisfied with their job, who have a longer disability period, who experience injury aggravation while participating in the program, or who have a poor perception of company support (Williams, 1991).

In a recent qualitative study, occupational therapists explored why people choose to return to the same high-risk careers after a serious work-related injury. Results

revealed common influential factors including a strong coworker support system and job satisfaction (Scheelar, 2002). With this deeper understanding of the adaptive process, a positive facilitation is more apt to occur.

Specific roles in facilitating successful adaptation may include fostering an environment of caring and sensitivity towards the injured worker by keeping the employee up to date about work issues or having the supervisor phone the employee periodically. This may also assist in promoting faster healing since the employee gets a sense of feeling missed and needed. If the worker has strong social support, the occupational therapist can tap into the worker's motivation for return to work by drawing upon their available strong social and professional networks available.

Often, injured workers tend to become frustrated due to the gap between their functional level and their job expectations. Occupational therapists may employ stress management techniques in order to help the worker cope with these high frustration levels. Along with stress reduction, it is important for the occupational therapist to assess the worker's perceived functional limitations.

The notion of "meaningful occupation" is also a consideration with the injured worker. Since the injured worker may be engaged in an early return to work program, identifying and developing meaningful alternative duty assignments is important. Alternative work will provide a positive, healthy physical and mental and challenge within medical restrictions.

Understanding the injured worker's perspective with regard to return to work will provide healthcare workers, employers as well as insurance companies with the necessary

information to develop strategies that are effective for the adjustment of the worker. The occupational therapist can play a unique and imperative role in easing the transition to normal work activities by facilitating the adaptive process so the worker can experience mastery with a successful return to work.

CHAPTER THREE

A CONCEPTUAL MODEL OF THE SOCIAL WORK ENVIRONMENT AND ITS ROLE IN RETURN TO WORK

Submitted for publication to Work

There is an increasing awareness that psychosocial factors in the work environment are involved in the return to work of the injured worker. Compelling evidence exists favoring positive associations between the social environment and return to work after injury (Toomingas, Theorell, Mechelsen, and Nordemar, 1997; Devereaux, Vlachonikolis, and Buckle, 2002; Joksimovic, Starke, v d Knesebeck, and Siegrist, 2002; Devereux, Buckle, and Vlachonikolis, 1999; Malchaire, Roquelaure, Cock, Piette, Vergracht, and Chiron, 2001). Concerning the prediction of success, several studies have shown that medical background diagnosis and physical impairment as well as physical variables (mobility and strength) have limited predictive value (Fruanulic, Carbonell, Pinto, and Sepulveda, 2004) with return to work. Disease is commonly thought to be manifested by the functions that occur in the social organization of the workplace (Hocking, 1990).

Work environments can have both disabling and enabling effects on the injured worker as well as with their experiences when returning to work (Strong, 1998). The Western Pacific Region of the World Health Organization (WHO, 2004) considers the workplace a priority setting for health promotion and protection in the 21st century. The

workplace can have either a positive or negative impact on the health and well-being of the workers, their families, communities and the society at large. However, the concept of a healthy work environment to which one returns after injury is not a reality for many workers. All too often, some combination of the physical and social work environment is responsible for injury, disease and the failure to return to work. How the worker perceives the environment may be of primary importance rather than as it may exist in an objective reality (Brofenbrenner, 1979).

Attention to the social hazards in the work environment and their associations with return to work after an injury should become an increasingly important component to interventions as well as promotion of an optimal work environment. Since 1922, Meyer described the occupational therapy environment as carefully managed and having the ability to provide patients with the opportunity to strive for meaning in their lives as well as have their needs met (Meyer, 1922). Occupational environments are contexts in which occupations occur. According to Spencer (1998), characteristics of the occupational environment include three subsystems that provide expectations for occupational roles and adaptive behaviors.

These subsystems include the physical, social and cultural. The physical subsystem is made up of the nonhuman factors while the social subsystem consists of those persons who may be influencing the environment through their social attitudes, actions and predispositions. The cultural subsystem reflects the method by which the physical and social subsystems come together and consists of procedures, methods,

rituals, values and the constraints of work, play and leisure, or self-maintenance (Spencer, 1998). The social subsystem of the work environment will be the primary concept of review regarding return to work after injury.

Occupational therapy's practice framework defines social environments as "including larger social groups which are influential in establishing norms, role expectations, and social routines" (AOTA, 1994). With review of the existing literature, the social work environment will be viewed in terms of relationships, work pressure and stress, control and structural factors. All of these subsystems can be relatively strong influencing factors with the injured worker's return to his or her previous employment.

RELATIONSHIPS

Whether the workplace operates locally with two employees or internationally with thousands, much of the work relies on the professional relationships that occur within the work environment. No worker functions solely in isolation and regardless of the communication medium, there are no abstract relationships. Ultimately, all work relationships are, at some level, built between individuals whether it is between coworkers, supervisors or outside individuals and/or customers. Effective relationships can be productive as well as diminish the chances of injury and increase the percentage of injured workers who are able to return to work. Poor perception of relationships, on the other hand, may decrease the probability of the injured worker returning to his previous level of employment and may increase the risk of re-injury.

Support

Support can have various conceptualizations including coworker and supervisor support. Social support in the workplace can be an influential system in the worker's successful return to work after injury. In a study of associations between perceived work conditions and musculoskeletal symptoms, the most pronounced association was seen between poor social work conditions and coexisting signs and symptoms of the upper extremity region. Primarily, poor social support at work correlated with these symptoms and signs of injury (Toomingas, et. al., 1997).

Social support was found to be a positive predictor of health functioning in a study by Stansfield, et al. (1998). The authors assessed whether certain work characteristics and social support act as predictors of psychological, physical and social functioning using the SF-36 General Health Survey with 10,308 subjects. Negative aspects of close relationships were found to be predictors of poor physical, psychological and social functioning. Interestingly, these psychosocial characteristics acted in a similar manner in both the healthy and injured workers. The authors concluded that negative aspects of close relationships can be strong independent predictors of ill-health which may have a causative role that is independent of the baseline illness (Stansfield, Bosma, Hemingway, and Marmot, 1998). Close relationships may have strong associations with the injured worker's return to work as well.

Bultmann and his colleagues (2002) examined associations between psychosocial work characteristics and fatigue. Results revealed that low social support at work were

associated with fatigue in both men and women. Specifically, strong associations were found between conflict with supervisors and emotional demands. These findings suggest that with a positive association between poor supervisory relationships and fatigue, workers have an increased risk of injury. Injured workers may recollect their poor work environment which may influence their motivation to return to work.

Associations between symptoms from the musculoskeletal system and social stressors in the job were analyzed in 1306 salespeople. Interestingly, a lack of social support from colleagues was specifically related to back pain (Skov, Borg, and Orhede, 1996).

Social support at work also has been associated with lower blood pressure during the workday and only small increases during more stressful times at work (Quigley, 2003). In a study with New York City traffic enforcement agents, researchers found there was a preferred source of social support depending on gender. Females tended to receive more benefit from strong immediate supervisor support while males preferred their support to come from their coworkers. Close social relationships are often a source of stress for women that would make supervisor support more preferential. The authors encourage future research in this area but warn that attention should be paid to any other moderating factors that play a role (Quigley, 2003).

In general, these findings suggest that if the injured worker perceives the work environment as having a poor support system, not only will this increase the risk of injury but provide no incentive to return. Facilitation of a supportive environment may be

beneficial to healthy workers as well as those that have been injured.

Issue of Legitimacy

The act of measuring, describing and understanding the injured worker's return to work is a complex task. Unfortunately, all too often, workers who complain of diffuse, subjective upper extremity pain are found to have no discernible physical pathology and are classified as having a musculoskeletal disorder (MSD) (Derebery, 1988). Many critics of MSD object that it is neither organic in nature nor work-related. It is often thought that MSD or bodily discomfort from work-related tasks is, in fact, not injuries but normal symptoms from particular types of work. These work-related injuries are often described as a compensation neurosis or a malingerer's complaint (Reid, et al., 1991). In a 1999 article, authors state that MSD is a reactive phenomenon and not a true disease but that poor diagnostics and epidemiologic technique have linked these somatic manifestations to the workplace (Cherniack & Warren, 1999). Some feel that popular suggestion and medical sensibilities have produced this syndrome (Ireland, 1988). The idea that MSD sufferers are malingerers who take advantage of the workers' compensation system may not be printed verbatim in the literature but Awerbuch (Awerbuch, 1985) labeled MSD as a "kangaroo paw" (Reid, et al., 1991).

Ireland (1988) points out that MSDs are more prevalent in occupations that are monotonous, dull and boring. They affect mostly women who are young to middle-aged and are rarely seen in the self-employed. He asserts that MSDs are physical symptoms resulting from unresolved psychological and emotional conflicts otherwise known as a

conversion disorder. Hocking (1987) compares these occupational epidemics to mass psychogenic illnesses.

One can see how these views are unsympathetic towards the work-related MSD sufferers. This perspective may in fact benefit insurance companies and employers who desire to discredit workers' compensations claims (Reid, et al., 1991). Since the notion of legitimacy has been a primary focus in the analysis of health and injury (Tarasuk and Eakin, 1995), it is a concept that tends to be particularly salient in terms of return to work and is worth including in the social environment.

Application for workers' compensation in conjunction with absenteeism due to an injury often accentuates suspicions of abuse and malingering. Work-related issues that are not always physically seen such as MSD tend to epitomize this issue. Tarasuk and Eakin (1995) conducted an ethnographic study reporting on issues of legitimacy that emerged with work-related back injury interviews. It was designed to generate a conceptual framework accounting for the workers' subjective experiences of work-related back injuries and social environment relationships. Themes and concepts that emerged from the data included suspicion and mistrust, damaged relations at work, and job insecurity. These data indicated that the worker's interactions with other workers shaped their experiences, including their attitude regarding return to work. Although this study's focus was towards workers with work-related back injuries, specific upper extremity musculoskeletal injuries also may experience problems with credibility and return to work due their absence of visible evidence.

This issue of legitimacy cannot only impact the worker's disability and his or her return to work but also how he or she perceives the social environment in the workplace.

WORK PRESSURE AND STRESS

Stress at work has been recognized as a factor in increasing risk for both mental and physical health problems (Salminen, Kivimaki, Elovainio, and Vahtera, 2003). High associations between physical and psychosocial work demands makes determining the relative influence of each on health and return to work difficult (Josephson, Pernold, Ahlberg-Harenstam, et al., 1999). Separating the physical and social work environment is difficult since it may be the complex nature of the two that contribute to work pressure and stress; therefore much of the literature reviewed reports a combination of these two factors.

Perceived stress is often linked with MSDs and may be a primary contributor to the development of the disease and the ability of injured workers to return to their existing work (Bongers, deWinter, Kompler, and Hildebrandt, 1993). There are several pathways for theoretical relationships between job stress and musculoskeletal disorders.

Psychological stress is understood as a process involving the interaction of the environment and its demands with the individual. Stress can lead to acute psychological, behavioral, and physiological reactions and ultimately affect an individual's physical health (Kagan and Levi, 1971). This particular stress model suggests that an intervening variable, such as individual psychological attributes, serves to change or modify the relationship between the stressors (environmental demands) and ill health (stress

responses). It gives primary importance to the environmental factors when determining health outcomes while other stress models may place more of an emphasis on the actual balance between environmental demands and individual resources as the determining factor of ill health (Caplan, Cobb, French, Van Harrison, and Pinneau, 1975).

Occupational therapy theory tends to place more of its importance on the individual. It is the worker's perception of the social environment and how he or she is able to handle or respond to the environment in the process of adaptation.

In general, stress at work may play a crucial role in the contribution of work related health risks. Stress may be more prevalent in persons with certain individual characteristics as well as in different working class. An example of a specific characteristic that may have a higher risk of delayed return to work is lower socioeconomic class. Siegrist (2002) completed a study that attempted to reduce social inequalities in the workplace. His findings concluded that work stress is indeed more prevalent among the lower socioeconomic status groups.

The extent to which work stressors and stress predict injuries in the work environment was studied in a total of 5,111 hospital employees. Results determined that significant stressors that predicted injuries were low control, monotonous work and low skill discretion. Workers more often involved in injuries included those with numerous interpersonal relationship problems and conflicts in collaboration at work (Salminen, et al., 2003).

JOB SATISFACTION

Job satisfaction regards the worker's feelings or state-of-mind regarding the nature of their work. It can be influenced by a variety of factors such as the quality of the relationship with the supervisor, the quality of the physical and social environment in which they work and possibly the degree of fulfillment in their work. Job satisfaction can vary and as research suggests, the more prestigious jobs tend to create greater satisfaction. Least satisfied workers are often found in service occupations that are often related to a limited education (Scarcella, 1995). Other variations in job satisfaction may also include the number of years of experience, gender and place of work (Margall and Duquette, 2000; Newton and Gibbs, 2001). Job satisfaction is an important factor since there is a strong acceptance among researchers that increased job satisfaction produces improved job performance.

Consideration should be taken when viewing the overall worker's job satisfaction in that it intertwines with other social concepts mentioned. Workers' perceptions of commitment, social support, stress and absenteeism may be strong determining factors of job satisfaction (Lowe, Schellenberg, and Shannon, 2003). In Lowe's study (2003) analyzing correlates of workers' perceptions of the extent to which their work environment is healthy and how these perceptions influence job satisfaction, the strongest correlate of a healthy work environment was good social support. Employees who rated a healthier work environment had a higher overall job satisfaction and lower absenteeism (Lowe, et al., 2003).

In a 2001 study (Malchaire, et al., 2001) that reviewed the association between psychosocial factors and upper extremity musculoskeletal complaints, specifically wrist and hand complaints were associated with both personality and psychosocial factors. Psychosocial factors included job satisfaction, perception and appreciation of the work and stress symptoms. Wrist and hand complaints were found to be associated with the psychosocial factor of poor appreciation of work while neck complaints were more positively associated with constraints as seen by the supervisor.

In an assessment of whether psychosocial factors at work were risk factors for the occurrence of back pain, authors found strong evidence with low job satisfaction (Hoogendoorn, van Poppel, Bongers, Koes, and Bouter, 2000). In an attempt to investigate other possible causes of back pain other than physical activity, Johnston and his colleagues (2003) interviewed material handlers to investigate the psychosocial environment and its role. After adjusting for a history of back problems and work-related lifting, authors found that the risk of back pain was increased among those employees who reported job dissatisfaction (Johnson, Landsittel, Nelson, Gardner, and Wassell, 2003). These findings support Hoogendoorn's (2000) findings.

CONTROL

Exposure to an adverse psychosocial work environment has been argued to elicit long-term ill health effects. Specific exposures are defined by high demands and low control (Siegrist and Marmot, 2004). The perception of control in the work environment is an important factor in retention and in maintaining a quality workplace. It is important

to realize that these exposures often have an association with socioeconomic status such as an increase in frequency of perceived lack of control in the lower socioeconomic class and in lower status groups due to their increase in vulnerability (Siegrist and Marmot, 2004).

MacDonald and his colleagues (2001) found that there were modest associations between psychosocial stressors and musculoskeletal disorders. Stressors discussed included monotonous work and low job control. Their investigation examined exposure covariation between both blue and white-collar workers who were employed in a manufacturing environment. Findings suggested a strong covariation among blue-collar production and low status office workers. Shared variance was revealed between repetition (physical stressor) and job control (social stressor), which suggested that these stressors might be manifested from common work organization situations (MacDonald, Karasek, Punnett, and Scharf, 2001).

Another study supporting the strong associations between work control and MSDs is that of Bongers, et al. (1993). This epidemiologic review presented evidence that low control on the job as well as lack of social support by colleagues were associated with musculoskeletal disease.

Depending on the social environment, control and work demand may be experienced differently. To illustrate this point, psychosocial exposures related to musculoskeletal complaints in dental hygienists were compared. Public dental health service hygienists generally experienced more complaints and reported that the work was

more demanding allowing them less control when compared to the work in private practice. An interesting finding utilizing regression analysis revealed that physical environmental factors significantly contributed to musculoskeletal complaints while the importance of psychosocial factors were not significant predictors (Ylipaa, et al., 1997). Although this study did not find psychosocial factors to be significant, the authors did find that higher control in the work environment seemed to be health promoting.

To contrast, Johansson (1995) studied a group (N=305) of home care workers and a reference group of municipal employees (N=694). The home care workers were found to be less satisfied with control over their work compared with the reference group of municipal employees. The combination of a poor perception of control in the work environment and a high physical workload seem to produce the highest rate of work-related neck and shoulder symptoms.

The social environment that is characterized by low authority over decisions may be compensated by other means such as a strong support system or low stress. This concept is supported in a musculoskeletal discomfort study with music teachers (Fjellman-Wiklund and Sundelin, 1998). Results revealed that music teachers often experienced their discomfort in their necks, shoulders and lower back. They characterized their social work environment as having high psychological demands and low control or authority over decisions. However, the music teachers reported these characterizations were manageable since they were compensated by a good social support system.

STRUCTURAL FACTORS

Understanding the worker's social environment and the possible issues that may arise with return to work contributes to the worker's adaptive process. Another key factor that may very well have a strong association with the worker returning to their occupation is an outside social system, the workers' compensation system. Long-term absenteeism due to a chronic disability such as a MSD results in high workers' compensation costs and lost productivity (Deyo, Cherkin, Conrad, and Volinn, 1991). Medical uncertainty about the outcome may also often leave workers vulnerable to authenticity of their injury (Tarasuk and Eakin, 1995). Some compensation boards make a practice of financial penalties against employers whose claim rates rise above the norm for their particular industry (Ison, 1989). This penalty was initially intended to encourage an increase in the health standards; although it may actually be increasing the problem of scrutiny of compensation claims and their claimants in the workplace (Ison, 1989). The Texas Workers' Compensation System reports in their web page that employers are usually not happy when an employee is injured on the job while some believe that workers are often not actually hurt on the job but are faking and exaggerating their injuries (TWCC, 2004). With this advertising, it is not surprising that injured worker's not only hesitate to report their injury thereby increasing the risk of a poor outcome but may also be finding a means of delaying their return to work in fear of poor overall support.

DISCUSSION

In the words of Hermann Melville describing Moby Dick's spout, "You have seen him spout; then declare what this spout is; can you tell me water from air? My dear sir, in this world it is not easy to settle these plain things." This quote offers a metaphor to work-related MSDs and our attempt to reveal etiology and the complex social issues with return to work after injury. It alludes to the fact that despite the vast amount of literature that exists, work-related MSDs and the social environment not only overlap but also are clearly of an extremely complex nature.

Work-related injury, specifically musculoskeletal disorders generally result from a combination of physical factors as well as workplace environmental or organizational factors. Return to work following an absence with a work-related musculoskeletal disorders can often be facilitated or remediated when both the physical and environmental aspects are appropriately addressed. The change in the organization factors may not only have positive effects with the intervention of injury and return to work but may demonstrate other positive factors such as an increase in productivity and a happier and more satisfied work force. A number of these psychosocial variables can play a mediating role between illness and its effects. Clinicians must play a positive and facilitative role in ensuring that this prevails.

After review of the literature, it is obvious that evidence varies depending on multiple characteristics of the worker and the type of engaged work. These factors intertwine and are also present when the injured worker attempts to return to work. The

literature suggests strong associations between measures of adverse social work environments including overall structural factors, relationships, stress, job satisfaction and control, their health and successful return to work following an injury. Much of the literature serves as a confirmation of the multifactor character of many work-related injuries and underline the need for a global approach to work situations in order to successfully return the injured workers back to their existing jobs.

Psychosocial variables have recently been more prominent among epidemiologic risk factors for work-related disorders. Future research on work organization determinants and their coincidence in jobs may provide promising new insights into not only the nature of risk for work-related injuries such as MSD but also with their return to work. Evidence for the role of specific work factors needs to be established with specific working classes. Unfortunately, mechanisms underlying these social mechanisms are often elusive due to the broad variables, which in turn make hypothesis testing difficult.

Occupational therapists should remember to acknowledge the importance of environmental factors in the lives of the injured workers by altering their assessment techniques and treatment practices accordingly to reflect the importance of the environment. This complex issue of health can be addressed by the expanding available research methods. This conceptual literature review supports a comprehensive model of the workplace that targets conditions, relationships, stress and structural organization for not only disease prevention but also a decrease in risk of delayed return to work.

Finally, it is also important to assess the individual's risk factors...simplicity of

generalizing the entire social work environment to maximize the percentage of return to work is just not feasible.

CHAPTER FOUR

PATIENTS' ADAPTIVE EXPERIENCES OF RETURNING TO WORK FOLLOWING MUSCULOSKELETAL DISORDERS: A MIXED DESIGN STUDY

Submitted for publication to the Journal of Hand Therapy

Musculoskeletal disorders (MSDs) affecting the upper extremity are recognized as a major cause of lost work time and account for one third of all occupational injuries and illnesses (Bureau of Labor Statistics, 2002). Injury to the worker can be a major source of burden to the employer and worker while leading to excessive work absence.

Returning the injured worker back to an existing program in the company is an obstacle that is often associated with this adaptation process. Existing studies suggest that most injured workers get back on the job without difficulty or disability; however, a small number of workers do not recover as quickly as expected and are responsible for much of the expense. Insurance industry statistics indicate that approximately 15% of workers' compensation claims represent failure to return to gainful employment (LWCC, 2004). In a 1998 study representation of 148 workers, it was estimated that the chance of an injured worker returning to work decreased 20% for every decade of increase in age and workers with a high level of psychological stress were less likely to return to work than those with low levels of stress (Crook, Molodofsky, and Shannon, 1998).

Multiple studies suggest that the speediest possible return to the workplace following an injury is the best for all concerned (Kunkel and Miller, 2002; Wasiak,

Verma, Pransky, and Webster, 2004). Statistics repeatedly support the notion that the quicker the employee returns to work; the quicker the case will be closed. Workers away from duty greater than 90 days after injury have less than a 50% likelihood of ever returning, while those away greater than 120 days have only a 10% chance of returning (LWCC, 2004). The term “soap opera syndrome” has been used to describe the “disabled” worker (LWCC, 2004). The longer workers are off work, the more likely they consider themselves disabled while becoming accustomed to the sedentary lifestyle and finally losing their motivation to return to work.

In view of this evidence, it would seem imperative to have a better understanding of the multifactorial nature of the worker’s adaptation process after injury, since returning to work is generally considered to be a good indicator of adaptation. Hand therapists view the injured workers as experiencing a disruption in their everyday work; this disruption requires the worker to come forth with an adaptive response to deal with their injury. The entire process from the time of injury until the worker’s return to work is considered to be an ongoing adaptation process.

The core of therapeutic clinical reasoning has been primarily focused on treating the workers’ illness, often neglecting to address their illness experience. There are no known studies that specifically focus on those personal experiences of coping with an upper extremity MSD including the actual treatment experience, adaptation process and outcomes. However, the notion of understanding an individual’s perspectives and experiences with adaptation has been explored in the past outside of the hand therapy literature. Multiple studies found in the literature addressed perceptions of older persons’

and their adaptive strategies to a particular challenge (Clark, Carlson, Zemke, et al., 1996; Karasz, Dyche, and Selwyn, 2003; Bontje, Kinebanian, Josephsson, and Tamua, 2004). Bontje (2004) and his colleagues completed a phenomenological study that explored the experiences of occupational adaptation among Dutch persons with physical disabilities. An emerging theme or finding from this study was that the participants strove for satisfaction through meaningful activity. In order for them to stay healthy and be successfully independent despite their disability, it was important for them to remain active in their daily routines as well as to engage themselves in meaningful activities.

PURPOSE

Despite many injured workers' successfully returning to work without disability or maladaptation patterns, there are the few who are unable to return to their previous line of duty. The concept of return to work following a disability is multifactorial in nature, and therefore, necessitates alternative types of research design to fully address all the relevant issues and questions. The pure mechanistic method of research (experimental) has been criticized as being authoritative in nature without considering the individual's perspective or experiences (Creswell, 1998). In order to better understand return to work after injury, it is important to consider the entire spectrum, including work-related biomechanical and non-biomechanical (personal and environmental) factors as well as the experiences of those who have lived with a work-related injury.

The purpose of this study was to explore the essence of experiences of workers with a work-related upper extremity MSDs and their adaptive strategies. The problem was approached by gaining perspectives of insiders, discovering how they perceive their

work environment with a MSD and looking for adaptive strategies in their adaptation process. A mixed design explorative study involving quantitative questionnaires and qualitative interviews with workers with upper extremity MSDs was conducted, followed by a descriptive analysis of the issues that emerged from the data and examination of their implications.

Background

Adaptation is the change in a worker's function that facilitates survival in their environment (Meyer, 1922). Hand therapists often observe this adaptation phenomenon on a daily basis while working with their patients. This is a phenomenon illustrated by the workers who are able to return to work with minimal therapeutic intervention. They demonstrate successful adaptive strategies, therefore returning to their previous line of duty. On the other hand, there are those workers who experience the same or even a less serious injury who tend to stagnate in therapy. They often become dependent on therapy and report only minimal improvement but insufficient for discharge. These workers may be thought of as developing maladaptive patterns, thus preventing their return to work.

Assessing only quantitative components with a lack of attention to the significance of a MSD in the workers' lives as well as their strategies for adaptation may greatly disservice the worker. Hand therapists may not be effectively and efficiently eliciting the worker's maximum adaptation capacity by treating only the illness and not the entire person. Recently, Chan and Spencer (2004) discussed a broader ongoing holistic study of the adaptive process in hand-injured patients. Their research team is currently studying how the process of adaptation evolves over time and is identifying any

environmental and personal factors that may influence the process. General findings thus far support the importance to clients' hand-injuries and having meaningful occupations and relationships. Other arising themes included the client's adaptive strategies that were categorized as interdependent and independent. Overall, the findings of the study revealed the complex relationship between physical recovery and psychosocial adaptation. An interesting finding from the present study suggested that 4 out of 5 participants became disenchanted between 4 and 6 months after injury because their expectations were not being met. Keeping this time frame in mind, the hand therapist can effectively intervene during this period of disillusionment.

The Occupational Adaptation theoretical framework used for conceptualizing the process of adaptation in this paper was developed by Schkade and Schultz (Schkade and Schultz, 1992). According to this theory, occupational adaptation is a normative process that focuses on the internal adaptation process of a person. It is the change of a worker's internal state as the worker moves toward a more functional, meaningful state of returning to work. This adaptation process is one that the injured workers move through including any interaction with their work environment. Their response to both intrinsic (personal) and extrinsic (environmental) factors will dictate the final outcomes. A successful response will result in "occupational performance with mastery and satisfaction" (Schkade and Schultz, 1992; Schultz and Schkade, 1992) or a successful return to work. This theory suggests that therapists' goals are to understand the phenomenon of a work-related upper extremity MSD that may disrupt the worker's

occupational adaptation process and to assist in providing the necessary intervention that facilitates their role as a worker.

METHODS

A criterion sampling technique for qualitative research was used in the selection of the four workers. "Criterion" sampling was chosen since all workers being studied represented people who have experienced the phenomenon of a MSD (Creswell, 1998). All clients were of working age, held a full-time job, spoke and read English and were recently diagnosed with an upper extremity work-related MSDs. Workers were asked to participate in the study for up to 4 months following their discharge from therapy. Data collection occurred at the initiation of therapy and 4 months after returning to work. Workers were asked to provide three kinds of data at both the initiation of therapy and 4 months after returning to work.

- (1) Completion of the Disability of Arm, Shoulder, and Hand (DASH) questionnaire to document health status, functional and psychosocial recovery, and perceived outcomes.
- (2) Completion of the Work Environment Scale (WES) as a measure of social environment at work.
- (3) Completion of qualitative interviews that were audiotaped with the subject's consent and later transcribed into written text for analysis.

(All data are reported for workers individually and collectively. Pseudonyms have been used to assure confidentiality.)

The Disability of Arm, Shoulder, and Hand Questionnaire (DASH)

The DASH questionnaire is an evaluative outcome measure for upper extremity musculoskeletal injuries consisting of a 30-item index that has been validated for use with a wide range of upper extremity conditions (Ware, Snow, Kosinski, and Gandek, 1993). The DASH is self-administered and is intended to measure symptoms and functional status with a focus on physical functioning (Navsarikar, Gladman, Husted, and Cook, 1999). In a study of reliability and validity (Beaton, Katz, Fossel, Wright, and Tarasuk, 2001), the DASH exceeded recommended standards for test-retest reliability for individual interpretation of the scores in 86 subjects (ICC = 0.96). The DASH was also shown to be sensitive to change in individuals diagnosed with cumulative trauma disorders and tendonitis (Beaton, et al., 2001).

The Work Environment Scale (WES)

The WES is a social climate scale that consists of 10 subscales measuring the actual (real), preferred (ideal) and expected social environments of work settings. The underlying dimensions that these 10 subscales assess include: relationship dimensions, personal growth dimensions, and system maintenance and change dimensions (Moos, 1994). Further descriptions of the scales are outlined in Table 1.

Test-retest reliabilities of individuals' scores were calculated for 75 employees revealing the test-retest reliabilities falling within an acceptable range. They varied from a low of 0.69 for clarity to a high of 0.83 for involvement (Moos, 1994).

Qualitative Interviews

Workers taking part in this study were each interviewed at the initiation of therapeutic intervention and again 4 months after their return to work. The interview asked open-ended semi-structured questions that searched for phenomena that may have influenced their adaptation process (See Appendix A). Qualitative data analysis was completed according to the common representation of phenomenology (Creswell, 1998). It included managing the data by creating and organizing files that emerged from the data. All texts were read through while making margin notes. The data was interpreted by developing a structural description of “How” the phenomenon was experienced. Finally, an overall description of the meaning and essence of the experience was completed (Creswell, 1998).

RESULTS

Qualitative Interview Results

Semi-structured, open-ended and in-depth interviews were conducted with each participant in a relaxed atmosphere. During the interview, participants were asked to describe verbally their experiences of the phenomenon of living and working with a musculoskeletal disorder. Interviews were taped, transcribed and analyzed to identify the major themes.

Persons with UE Work-Related MSDs: Accounts of the Adaptive Process

Mr. Kenneth

Mr. Kenneth works for a railroad company as a car inspector. He describes his job as quite active. “I go underneath, on top, around, and every which way around the

cars (railroad cars) to see if anything is broken. I write, stand, sit, crawl, climb and lift throughout the day.” He reports his job mainly takes place outside under minimal shade. “It’s pretty hot sometimes. It can be difficult to breathe because of all of the dust and the leaking tanks cars.”

Mr. Kenneth says that all of his coworkers have been working together for about 10-15 years. “We all get along. It’s the bosses that we argue with. They (bosses) are always getting onto us because they think we are always horsing around but I think it keeps everyone happy...it’s important that everyone stays happy.” Mr. Kenneth believes that his coworkers get to know one another because of their “horsing” around. “If the job gets done, what’s the problem?”

Mr. Kenneth seems to be confident with his work performance. “I have been doing this job for 28 years so I don’t have any weaknesses. I’m good at what I do.” Mr. Kenneth reports he enjoys his job despite his injury. “Everybody at my job has been really supportive after I came back from rehab.”

Over the years, Mr. Kenneth says there have been some major changes with his job. Another company that brought new management as well as new methods bought his company. “This was a difficult time for all of us. We stuck with it because the pay is good and they can’t fire you. We’re union.”

After rehab was completed, Mr. Kenneth returned to his job without any physical modifications. He felt his therapy experience helped him adapt to the work. “I had such a good experience at therapy. My wife helps me with the home program. I still work out

at home just like I did in therapy.” As much as he enjoyed his therapy experience, Mr. Kenneth was ready to return to his normal way of life.

Ms. Goodwin

Ms. Goodwin is an accounting manager for a movie theater. She says her job takes place mostly at a desk so it sometimes is difficult to deal with the pain. Her physical environment is described as brightly colored, roomy and always cold. “We don’t have control over the AC (air conditioner). Corporate controls our AC.” The sociocultural environment is described as close-knit. “We have a pretty good working relationship. We eat lunch together but other than that, don’t take many official breaks during the work day.” Customer service is a valued concept in her company. “During peak season, we try to get everyone geared up by promoting excellent customer service.”

Ms. Goodwin describes her work performance as efficient and focused because of her love for the job. “I am really focused when I go to work. I get into my work and have a hard time trying to break away from what I am doing...that’s probably why I ended up here (referring to therapy).” She had some difficulty pointing out her limitations but eventually insisted that she would like it if other people learned to better focus on their work. Ms. Goodwin’s work history started with fast food but quickly changed to the business world. She worked for an oil company for 6 years finishing in management. “When I had children, I did not work but soon after, I went to work for the movie theater. Wherever I work, it’s important that all of the people I work with get along and have a good working relationship.”

In her follow-up interviews after her return to work, Ms. Goodwin states she feels better and would definitely go through the therapy again. "I still do all of the things we practiced and talked about in therapy. I have even picked up gardening again." Returning to her valued activities and occupation seemed to be important to Ms. Goodwin in addition to her work.

Mr. Pacific

Mr. Pacific has cubital tunnel syndrome and carpal tunnel syndrome bilaterally. He is a supervisor with a railroad company. His physical environment is described as very dusty, dirty and dark. If it rains, the men continue to work despite the weather conditions. He feels there is a good sociocultural environment in that everyone seems to get along. Mr. Pacific feels he has a close relationship with his coworkers. Cohesion between workers seems to be strong. "I think I get along with everyone...including the management. I'm pretty laid back." He reports starting his day on a computer for 30 minutes followed by a daily safety meeting. "I then go out to see what cars are on the track. I meet with all of my guys to let them know what has to be done for the day. This all happens from 3 pm to 11 pm. I occasionally may need to lift things to help out the men. Breaks are only taken if absolutely necessary...so I don't usually take them. If I did take a break, it would only be about 5 minutes." Mr. Pacific's workplace offers a structured environment with few breaks.

"As far as my work, I think that I do most things very good. I've been told that I have good communication skills. The only problem I do have is that I forget things...I have to write things down." Mr. Pacific is a second-generation railroad worker in his

family. “My dad had this job so I never thought much about what I was going to do...I have always done this and I probably always will. This injury will only slow me down for a while. Since I am now a supervisor, I shouldn’t have problems in the future.”

Since his injury and treatment, Mr. Pacific explains that he surfs and can play 18 holes of golf. He has joined a fitness facility and exercises at a minimum of three times a week. “The exercise is a change for me...I feel great doing it.” Mr. Pacific seems to value his leisure activities in addition to his work.

Ms. Parks

Ms. Parks is a middle-aged homemaker who cares for her daughter. Ms. Parks is diagnosed with a non-traditional work-related lateral epicondylitis. She reports her daily routine was pain-free prior to her daughter moving back into her home with her. “Before she moved back in with me, my life was good. I went to school to take art classes and took care of the house. My job was taking care of my house and my husband. You know, normal.” In October, Ms. Parks received a call from her daughter to inform her she had been diagnosed with Parkinson’s disease. Within a month, Ms. Park’s daughter had moved in with her for help. “After two months of living with me, I was doing everything for her.”

Ms. Parks describes her physical work setting as crowded. “I like open space with things spread apart. I don’t like things tight and cluttered. When she moved in, it just felt even smaller.” The sociocultural environment is one of her being the boss, the one who is in control. Her work is difficult and consistent with few breaks both physically and mentally. This concept of having breaks was an adaptive challenge. “My

house is such a...I don't know how to describe it. I try to keep the environment calm. I don't like it crazy. I'm not a carefree, throw it to the side, get to it later type of person. I like to be on top of things. Because of this, I don't get any breaks or time to myself."

Ms. Park's perception of her work performance is one of self-confidence. "I can pretty much see what needs to be done and be one step ahead...actually, I am about ten paces ahead of everybody in my thinking process which is frustrating. I am a rule follower. I don't like bending or breaking rules. I am clean, neat and organized. I do my job well." As far as her pain in her arms, Ms. Parks reports that she always hurts and no one seems to believe that she is truly in pain. Musculoskeletal disorders are invisible to surrounding people...."you don't see anything; therefore, there is no injury."

When Ms. Parks moved to the community she is now residing in, she felt her life change before her. Her daughter's illness seemed to be an influencing factor as to her work choice. "Just dealing with the emotional aspects of my daughter and her disease...what it has done to her life and what it has done to her physically. My hands seem like nothing comparably. I have had no choice regarding my work...this is what has been handed to me." Ms. Parks states she has never been comfortable working for money but always has been the volunteer-type. "If you need help, I will do it for you. Tell me, I'll be there and I don't want anything in return." At this time, Ms. Parks wonders if she is going to get to the next phase of life and also wonders what that phase has to offer. "How does this work? My friends are not here. My family is not here. I don't have anyone to talk to, a sounding board just to bounce things off of. I'm learning to lean on myself as opposed to having another person there. It's impossible to have

someone there but if not, you can't cave in. You have to find another way to approach it." Working alone and a lack of support seem to be difficult and challenging to Ms. Parks.

DASH Results

DASH subscales included the individual's 'treatment expectations', their 'satisfaction with treatment', 'overall function', and their 'function at work.' Scores at 0 represent "no disability" while 100 represents the greatest disability. According to Beaton, et al. (2001), a minimal detectable change for the DASH was determined to be 12.7. For the purposes of this descriptive analysis, a meaningful change of 12.7 or greater was used.

All of the workers demonstrated a meaningful change in their "overall function" at 4 months after their return to work. Seventy-five percent demonstrated a meaningful change in their 'function at work' and only 1 out of 4 showed a meaningful change in 'treatment expectations'. The 'satisfaction with treatment' scale is derived from the client's direct response to the Likert scaled questions, where 1=very dissatisfied and 5=very satisfied. Results are shown in Table 2 and graphically in Figure 1.

WES Results

Workers' "real" data at their initial evaluation, 4-months after their return to work, and their "ideal" work environment at 4-months were revealed in their response to the WES questionnaire. Results are displayed below (Table 3). Mr. Kenneth's results demonstrated similar associations in subscales 1-10 when comparing his 4-month "real" and "ideal" results. There was no apparent difference in his perception of his "real" and

“ideal” work environment. Ms. Goodwin perceived large differences between her “real” work environment and “ideal” environment at her 4-month follow-up in all subscales except in the subscale of “managerial control”. Mr. Pacific showed unremarkable differences at his 4-month follow-up in all subscales except ‘supervisor support’, ‘work pressure’, and ‘communication.’ Ms. Parks demonstrated differences in her perception of “real” and “ideal” work environments in five of the subscales at the 4-month follow-up: ‘involvement’, ‘coworker cohesion’, ‘supervisor support’, and ‘work pressure’.

Emerging Themes

Comparison across the four cases led to the identification of three major themes that characterized the adaptive process. These themes included the importance of ‘meaningful relationships’, ‘satisfaction with work’, and ‘discovering activities outside of the work environment.’

Importance of Meaningful Relationships

A work environment can sometimes be difficult or trying and is made more tolerable with support from coworkers or management. Coworker relationships were a motivating factor in the adaptive process. Mr. Kenneth seemed to value his coworkers’ relationships by commenting that they horsed around which made them happy. He laughed a great deal when discussing this during the interview indicating that the thought of his coworkers “horsing around” was pleasant. Ms. Goodwin valued a “good working relationship” with her coworkers and Mr. Pacific stated, “I think I get along with everyone...including the management.” Although Ms. Parks seemed to have maladaptive issues, she made comments that alluded that relationships were important to

her as well. “How does this work? My friends are not here. My family is not here. I don’t have anyone to talk to, a sounding board just to bounce things off of.” The needed relationships were not available to her; therefore fostering a strategy of self-reliance.

Importance of Satisfaction with Work

Satisfaction with work seemed to be a motivating factor in the adaptive process. In general, people tend to thrive with success. Once a sense of success has been achieved, the task at hand seems to become more satisfying. This sense of satisfaction emerged during the interview process. Mr. Kenneth had been doing his job for 28 years and was “good” at what he does. Ms. Goodwin reported she was extremely focused when at work while Mr. Pacific was told he had good communications skills and reported he was “good” at what he does. Although Ms. Parks reported herself as being efficient in her work, she did not report any kind of enjoyment in taking care of her daughter. An important consideration with Ms. Parks is her type of work as a personal caregiver for a family member. This brings about emotional factors that may not be an issue with the other workers.

Importance of Discovering Activities Outside the Work Environment

Those who work a full-time job requiring 40 hours per week or more often find themselves spending much of their time with their coworkers; therefore, the importance of relationships is an important motivating strategy in the adaptive process. On the other hand, many of these participants left the workplace and developed adaptive strategies outside of the work environment. Mr. Kenneth felt his therapy experience helped him in his adaptive process by providing him with a home program. He accepted help from his

wife to help him carry out his home program. Ms. Goodwin began engaging herself in activities that she was not able to do during her injury. Gardening became her motivator at home. Mr. Pacific stated that he joined a fitness facility, "The exercise is a change for me...I feel great doing it." Out of the four participants, Ms. Parks was the single participant who did not have an outside activity that was meaningful and served as a motivator in her adaptation. In fact, one of her few outings during the week included attending her therapy sessions. Her strategy of dependence is demonstrated by utilizing therapy as her "outlet" since it seemed that it was her only source of support. She became addicted to the sessions to an extent that made discharge difficult. Ms. Parks had a great deal of difficulty returning to her full duty as a caregiver. This may be an understandable phenomenon since she is caring for her daughter who has a chronic, progressive disease.

DISCUSSION

Overall, findings from this exploratory study support the notion that individuals are extremely complex. Their adaptation process is evolving and constantly changing. This study emphasizes the importance for the therapist to think autonomously and welcome the complexities that exist with the injured worker. Qualitative research explores a social or human problem and takes into account multiple variables (Creswell, 1998). By entering into the worker's subjective world, the therapist can better understand their adaptive process and strategies developed during the process. Strategically including qualitative interviews in therapy will allow the therapist to gain a more holistic view of patients. Interviews can take place during therapy sessions and can foster a

positive relationship between the worker and therapist. They can also increase the hand therapists' understanding of the worker's adaptive process and help identify specific motivators that can be elicited during therapy. Many workers in this study responded to the interviews with comments such as "I didn't realize these other things contributed to my problem" or "It was nice that someone took the time to dive deeper into this problem." Workers enjoyed talking about themselves and the uninterrupted attention they received from the interview.

An understanding of the individuals' work environments as well as their perception of their MSD can be beneficial to the hand therapist who is facilitating the return to work process. Qualitative interviews offered an individual perspective of how work impacts clients' MSDs and prompted the therapist to question the methods of providing intervention to this population.

According to the DASH results, most workers' overall functional status improved in the 4 months following discharge from therapy and a majority felt their function at work was not a problem. Scores for all of the subjects revealed a change of 20 or greater which may reflect a real change as this was supported with the interviews. Strong self-assurance was not as apparent during the initial interviews as in the follow-up interviews. This was specifically seen in Mr. Pacific's interviews with his follow-up comments regarding his new promotion as a supervisor and how he did not anticipate future injury. Positive and optimistic responses regarding their work performances were noted in many of the workers. An individual's positive self-confidence may be a factor to consider upon initial evaluation as a possible determination of outcome.

When considering the results from the WES questionnaire, specific areas in the work environment can be addressed to further facilitate the worker's adaptation. For example, Mr. Kenneth's perception of his "ideal" work environment was similar to his "real" environment. All of Mr. Kenneth's scores were identical in all subscales except "control". This may not be a startling finding in that during his interviews he stated, "We all get along. It's the bosses that we argue with. They (bosses) are always getting onto us because they think we are always horsing around but I think it keeps everyone happy...it's important that everyone stays happy." This may suggest that change in the overall work environment may not be a priority. Focus of change may include dealing with management in a more effective, efficient and satisfactory manner.

On the other hand, Ms. Parks showed significant differences in her perception of her "real" work pressure (WP) versus the "ideal" work pressure. Although there was a difference in all subscales, the greatest noted was six in the subscale of 'work pressure'. An unnecessary amount of work pressure may not necessarily be a direct cause of an upper extremity MSD but may be a significant contributing factor. The amount of work pressure Ms. Parks' experiences may be one of the contributing factors in her internal ability to generate and integrate an appropriate adaptive response. Focus of treatment for Ms. Parks should be directed at improving her adaptation response by including mechanisms for dealing with the amount of work pressure.

Traditionally, the role of the therapist has been to objectively measure a patient's progress through means of such contributions to function as range of motion, strength and sensation. Other than these traditional roles, the therapist may expand into facilitating

methods of handling the amount of pressure at work and increasing the efficacy of dealing with the load of work. Often, therapists do not follow the client after discharge from therapy and back to work. With use of the WES, DASH and qualitative interviews, their role with these workers may expand into the actual work environment by interacting with the manager, the worker's coworkers and the worker in facilitating a successful return back to work. Qualitative interviews may not only be important in the evaluative process to determine the worker's history and their perception of the problem but may also assist in evaluating the workers' view of their work environment and its role in their adaptive process. Interviews can also assist in setting treatment agendas as well as a plan of care for the worker.

In conclusion, all four workers demonstrated an ability to generate and evaluate an adaptive process. Mr. Kenneth, Ms. Goodwin, and Mr. Pacific also seemed to be able to integrate an adaptive process in which all experienced relative mastery. Unfortunately, at the final interview (4 months), Ms. Parks did not achieve the satisfaction of relative mastery. She finalized her interview by stating, "How does this work? My friends are not here. My family is not here. I don't have anyone to talk to."

By considering the workers' perception of their problem, their work environment and their experiences through their own words, therapists improve their understanding of the adaptation process. This view of the worker allows the hand therapist to treat the workers' experience rather than versus isolating their injury and treating only the upper extremity.

LIMITATIONS

Several limitations may be noted in this study. Primarily, it is important to remember that findings from this study are specifically for the four workers involved in the study; therefore they may not be applicable to other injured workers. All of the workers were diagnosed with a variety of musculoskeletal disorders and held jobs outside of the home with the exception of one worker whose job took place in the home environment. This combination may have created difficulty when interpreting the results. Future research may involve specific MSD diagnoses along with similar occupations in order to have a better understanding of job and/or person specific results.

Table 1.
Work Environment Subscales and Dimensions

Dimension	Subscale
Relationship Dimensions	Involvement, Coworker Cohesion, Supervisor Support
Personal Growth Dimensions	Autonomy, Task Orientation, Work Pressure
System Maintenance and Change Dimensions	Clarity, Managerial Control, Innovation, Communication

Appendix A: Work Adaptation Interview

- (1) Please describe your regular routine at work in detail.

Daily routine.

Weekly routine.

Monthly routine.

Other timeframes.

- (2) Please describe your workplace.

Physical setting.

Social setting (relationships with coworkers, boss, etc...)

Expectations and values (do you do anything at work you would consider a ritual?)

- (3) Please describe your current work performance?

Things you do well.

Difficulties experienced.

- (4) What changes have occurred since we last talked?

Changes in work experience.

Changes in the workplace.

- (5) What factors influenced these changes? What are your views about these influences?

Individual consultation

Therapy experience

Work environment modifications

Other factors

Table 2.
Disability of Arm, Shoulder, and Hand Results

Client		Treatment Expectation	Δ	Satisfaction with Treatment	Δ	Overall Function	Δ	Function at Work	Δ
Mr. Kenneth	Initial	87.5		1		34.1		100	
	4-mos	85	25	3	2	5.83	28.3*	0	100*
Ms. Goodwin	Initial	83.3		1		50.3		50	
	4-mos	95	-11.5	4	3	11.7	38.6*	0	50*
Mr. Pacific	Initial	95.8		1		37.5		100	
	4-mos	65	30.8*	4	3	1.7	35.8*	0	100*
Ms. Parks	Initial	16.7		1		68.3		75	
	4-mos	55	-38.3	1	0	49.2	19.1*	93.75	-18.8

Notes: Δ Indicates change. (*) Reveals a significant change (12.7 or greater)¹⁰

Figure 1.
DASH Results: Initial and 4-month Follow-Up

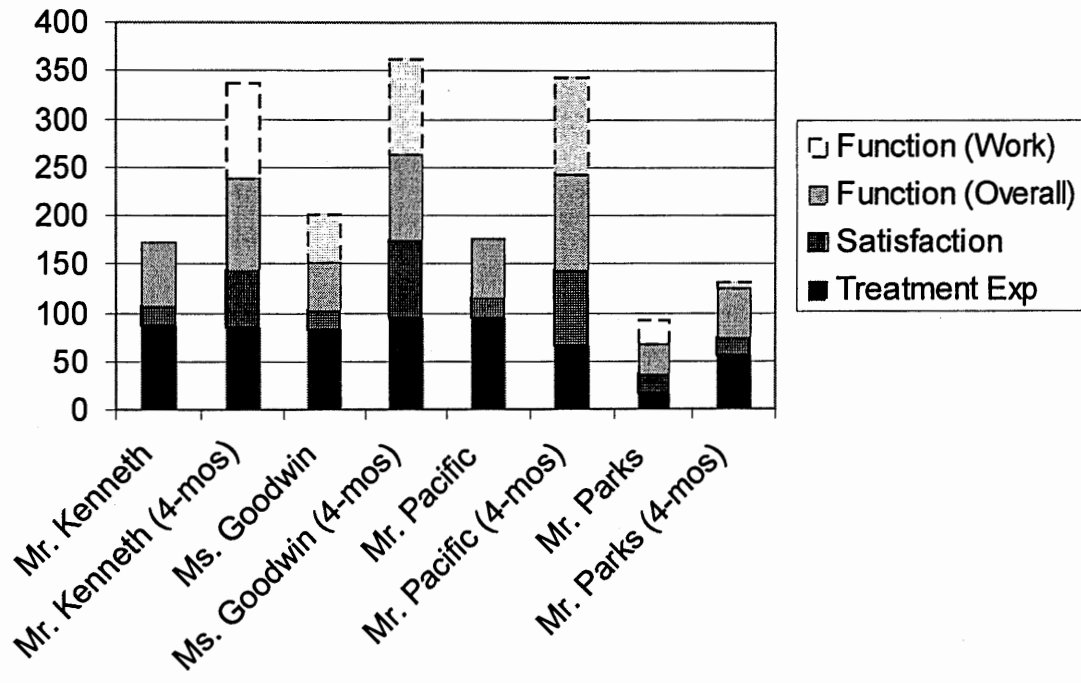


Table 3.
Work Environment Scale scores 4-months after Returning to Work

	Mr. Kenneth		Ms. Goodwin		Mr. Pacific		Ms. Parks	
	Real	Ideal	Real	Ideal	Real	Ideal	Real	Ideal
Involvement	3	3	3	9*	9	9	6	9
Coworker	3	3	2	8*	9	9	6	9
Cohesion								
Supervisor	0	0	3	8*	4	7*	5	9*
Support								
Autonomy	2	2	5	8*	5	7	8	9
Task Orientation	3	3	0	9*	7	8	8	9
Work Pressure	6	6	9	3*	6	1*	6	0*
Clarity	2	2	3	8*	6	8	6	8
Managerial	9	8	6	7	5	4	8	6
Control								
Innovation	0	0	1	7*	7	6	5	6
Communication	3	3	6	8	3	6*	9	8

Note: (*) indicates a difference in perception of “real” and “ideal” work environments

CHAPTER FIVE
COMPARISONS OF INJURED WORKERS' PERCEPTIONS ON SOCIAL FACTORS
IN THE WORK ENVIRONMENT

Submitted for publication to the American Journal of Occupational Therapy

Injury at work can be a major source of burden to the worker as well as the employer while leading to excessive work absences. Returning the injured worker to work is often an obstacle that is associated with work-related injuries. There are existing studies that found that a majority of workers return to their existing jobs without difficulty or disability; however, there is a small number of workers who do not recover as quickly and are responsible for much of the expense (LWCC, 2004).

Unfortunately, many work-related injuries such as musculoskeletal disorders (MSD) are not easily objectively quantified with commonly seen range of motion and strength data. In fact, it is often thought that MSD or bodily discomfort from work-related tasks are, in fact, not injuries but normal symptoms from particular types of work. These work-related injuries are often described as a compensation neurosis or a malingerer's complaint (Reid, Ewan, and Lowry, 1991). Work-related issues that are not always physically visible tend to epitomize this issue. Studies have shown that medical background diagnosis and physical impairment as well as physical variables (mobility and strength) have limited predictive value (Franulic, Carbonell, Pinto, and Sepulveda ,

psychosocial factors in the work environment (Toomingas, et al., 1997; Devereaux, et al., 2002; Joksimovic, et al., 2002; Devereux, et al., 1999; Malchaire, et al., 2001). Perceived stress is often linked with work-related injuries and considered to be a primary contributor to the development of disease that influences the ability of injured workers to return to their existing occupation (Bongers, et al., 1993). Since objective measurements such as mobility and strength are not considered to be of important predictive value, a number of researchers suggest that quantitative predictive measures may exist within the worker's social environment (Fraunulic, et al., 2004).

LITERATURE REVIEW

Return to work following a work-related injury brings about multiple concerns and issues including the length of time away from work and continuation of normal or modified duties during recovery. The worker may not only experience diminished ability to adapt to his or her injury but also to the work environment, especially if that environment is not conducive to returning to work after injury. The role of the work environment, as well as the worker's perception of this environment, may be primary areas of concern in regards to returning the injured worker back to work.

The speedier the return to work after injury, the sooner the worker's case is closed (LWCC, 2004). Workers who have not returned to duty within 90 days of injury have less than a 50% likelihood of ever returning to their existing job (LWCC, 2004). These chances have been shown to decrease 20% for every decade of an increase in a worker's age. Furthermore, workers with a high level of psychological stress are less likely to return to work (Crook, et al., 1998). These statistics are consistent with the theory that

the longer workers are off work, the more likely they consider themselves disabled while becoming accustomed to the sedentary lifestyle and finally losing their motivation to return to work. Other possible obstacles to consider may include the worker's perception of the work environment and its role with return to work. If the worker does not feel a sense of support from the work environment, the idea of returning to this environment may not be appealing.

Attention to the social factors in the work environment and their associations with return to work after an injury should become an increasingly important component of interventions as well as promotion of an optimal work environment. Classically, Meyer (1922) described the occupational environment as carefully managed and having the ability to provide patients with the opportunity to strive for meaning in their lives as well as have their needs met. This statement contains strong connotations that support the idea that perception of the social environment at work may be a strong contributing factor to return to work.

The theoretical framework used for conceptualizing this process of adaptation and return to work was developed by Schkade and Schultz (Schkade and Schultz, 1992). Based on the theory of Occupational Adaptation, it is a normative process that focuses on the internal adaptation process of a person. It is the change of a worker's internal state as the worker moves toward a more functional, meaningful state of returning to work. This adaptation process is one that injured workers move through and includes any interaction with their work environment. It is their response to both intrinsic (personal) and extrinsic (environmental) factors that dictates the final outcome. A successful response or

adaptation will result in “occupational performance, mastery, and satisfaction” (Schkade and Schultz, 1992; Schultz and Schkade, 1992) or a successful return to their previous employment. According to Spencer (1998), characteristics of the occupational environment include three subsystems that provide expectations for occupational roles and adaptive behaviors. These subsystems include the physical, social and cultural. The physical subsystem is made up of nonhuman factors while the social subsystem consists of those workers who may be influencing the environment through their social attitudes, actions and predispositions. The cultural subsystem reflects the method by which the physical and social subsystems come together and consists of procedures, methods, rituals, values and constraints of work, play and leisure, or self-maintenance (Spencer, 1998).

The worker’s position in the social work environment can have influential effects on his or her health and well-being (Gardell, 1980). A supportive social environment can be a positive influence, if not a motivating factor, in the injured worker’s return to work. Whereas, on the other hand, an environment that is considered negative or unsupportive can have detrimental effects not only to the existing workers’ health but in the successful return to work of injured employees. Obviously, the workplace can have either a positive or negative impact on the health and well-being of the workers, their families, communities and society at large. However, the concept of a healthy work environment to return to after injury is not a reality for many workers. All too often, some combination of the physical and social work environment is responsible for injury, disease and the failure to return to work.

PURPOSE/HYPOTHESES

How the worker perceives the environment may be of primary importance rather than as it may exist in an objective reality (Bronfenbrenner, 1979); therefore, the worker's perceptions of his or her social environment and time away from work were studied to determine possible associations. These were compared to the worker who did not take time off of work and his or her perceptions of the social environment.

Working Workers (WW): Worker continued to work and engage in formal occupation; occupation may consist of "light" or "modified" duty

Non-Working Workers (NWW): Worker stopped working and did not engage in formal occupation during recovery

The purpose of this study was to answer the following research questions:

- 1) Is there a significant difference between the "WW" and the "NWW" and their perceptions of social support in the work environment at initiation of therapy?
- 2) Is there a significant difference between the "WW" and the "NWW" and their perceptions of their health and well-being (physical and emotional well-being) at initiation of therapy?
- 3) Is there a significant change in perceptions of physical functioning over time (between initiation of therapy and discharge) with the "WW"?
- 4) Is there a significant change in perceptions of physical functioning over time (between initiation of therapy and discharge) with the "NWW"?

MATERIALS AND METHODS

A convenience sample of 30 workers who were diagnosed with an upper extremity MSD participated in this study. All workers were of working age, held a full-time job, and spoke and read English. All workers were asked to participate in the study during their length of time in therapy. Once the workers agreed to participate, consent forms were obtained. Data collection occurred at the initiation of therapy and at discharge of therapy by the investigator who also served as the primary treating therapist. Workers were asked to provide two kinds of information at both initiation and discharge from therapy.

- (1) Completion of a Short-Form Health Survey (SF-36) to document health status (SF-36), functional and psychosocial recovery and perceived outcomes.
- (2) Completion of the Work Environment Scale (WES) as a measure of social environment at work.

Short-Form Health Survey (SF-36)

The SF-36 was designed for use in clinical practice, research, health policy evaluations, and general population surveys. It includes one multi-item scale that assesses eight health concepts: 1) limitations in physical activities because of health problems; 2) limitations in social activities because of physical or emotional problems; 3) limitations in usual role activities because of physical health problems; 4) bodily pain; 5) general mental health (psychological distress and well-being); 6) limitations in usual role activities because of emotional problems; 7) vitality (energy and fatigue); and 8) general health perceptions (Hays, Sherbourne, and Mazel, 1993).

Internal consistency for the multi-item subscale was estimated using Cronbach's alpha coefficient. Reliability coefficients exceeded 0.70 in all scales. Reliability with specific conceptual areas of the SF-36 used in this study included those of physical functioning, role limitations due physical well-being and role limitations due to emotional well-being. Physical functioning included 10 items and in a study of 2,471 subjects, internal consistency reliability revealed a score of 0.93. Role limitations due physical well-being demonstrated a reliability of 0.86 while role limitations due to emotional well-being was 0.83 (Stewart, Sherbourne, and Hays, 1992).

Work Environment Scale (WES)

The WES is one of 10 social climate scales and consists of 10 subscales that measure the actual (real), preferred (ideal), and expected social environments of work settings. The underlying dimensions that these 10 subscales assess include: relationship dimensions, personal growth dimensions, and system maintenance and change dimensions (Moos, 1994). Test-retest reliabilities of individual scores were calculated for 75 employees revealing the test-retest reliabilities falling within an acceptable range. They varied from a low of 0.69 for clarity to a high of 0.83 for involvement (Moos, 1994).

RESULTS

The study included a total of 30 subjects (12 men [40%] and 18 women [60%]) with a mean income of \$50,000-\$59,000. Out of the 30 subjects, 26 (86%) were White, 3(10%) African-American, and 1 (3%)Asian or Pacific Islander. Twenty-three (77%) of the 30 workers were married, 1 (3%) lived with a significant other, 4 (13%) were

divorced, and 2 (6%) were widowed. Education levels included mostly subjects with some college education 15 (50%), 8 (27%) subjects who graduated from high school, 6 (20%) who graduated from college and 1 (3%) who completed a postgraduate education. Finally, those injured workers who continued to work throughout their therapy process (“WW”) included 16 (53%) of the subjects (11 female) while 14 (47%) did not perform any kind of formal work during therapy (“NWW”).

All workers’ injuries occurred on the job with the majority of them diagnosed with either carpal tunnel syndrome (33%) or lateral epicondylitis (33%). Twenty-seven percent of them suffered from cubital tunnel syndrome and 6% with shoulder impingement syndrome. Out of the thirty subjects, 47% considered their work to be categorized, as ‘office jobs’ while 27% were ‘manual laborers’ and 17% held managerial or supervisor roles. One percent was a hairdresser, mechanic and a restaurant waitress.

Five null hypotheses for this study were established and tested as listed below.

Null Hypotheses:

H1: No significant difference in the perceptions of social support in the work environment between the “WW” and “NWW” groups.

H2: No significant difference in the perceptions of role limitations due to physical well-being between the “WW” and “NWW” groups.

H3: No significant difference in the perceptions of role limitations due to emotional well-being between the “WW” and “NWW” groups.

H4: No significant difference in change over time of physical functioning in the “WW” group.

H5: No significant difference in change over time of physical functioning in the “NWW” group.

A Pearson’s correlation analysis was performed to explore the potential relationships among the variables. Table 1 and 2 provide a summary of the results of the correlations among the social support, role limitations due to physical well-being, and role limitations due to emotional well-being for the working and non-working groups. Pearson’s correlation revealed a significant relationship ($p < .05$) between the variables emotional well-being and physical well-being for the working groups only. Table 3 provides information on the means and standard deviations for all the variables.

Independent t-tests were also used to analyze the differences between the two groups (“WW” and “NWW”). All hypotheses with the exception of H1 revealed no statistical significance. Since the null hypothesis (H1) was rejected ($t=2.323$; $df=28$; $p < .05$), therefore, significant difference in the perceptions of social support in the work environment between “WW” and “NWW” was revealed. Results from hypothesis H2 revealed $t=1.765$; $df=28$; $p > .05$ therefore the null hypothesis was retained that there was no significant difference found in the perceptions of role limitations due to physical well-being between “WW” and “NWW”. Hypothesis 3 (H3) demonstrated that $t=-.068$; $df=28$; $p > .05$ therefore the null hypothesis was also retained that no significant difference was found in the perceptions of role limitations due to emotional well-being between “WW” and “NWW”.

Finally, null hypothesis, H4 and H5 were also retained with no significant difference found in the change over time of physical functioning between “WW” and “NWW”. H4 results were $t=-1.578$; $df=13$; $p>.05$ and H5 $t=-.220$; $p>.05$.

DISCUSSION

The notion of return to work is often complicated by many obstacles. One is the amount of time the worker spends away from this job recuperating. The trend with the injured worker seems to be geared toward a major paradigm shift of services that take place on the actual worksite or allowance of workers to attend therapy outside of the work environment. When the worker is rehabilitated while remaining employed, the employer not only assumes more control but may also experience a reduction in workers' compensation claims (Shrey, 1996). In Crook's (1998) study, workers who were offered a “light-duty or modified” job were twice as likely to return to their previous work than those workers who were not offered the modifications. It is estimated that employers save approximately \$96 for every dollar spent in rehabilitating the injured worker to return to their previous job tasks (LWCC, 2004). Injured workers who participated in an onsite program while receiving 100% of their wages demonstrated a reduction in overall workers' compensation costs (Shrey, 1996).

Return to work is often associated with social factors in the work environment such as social support and the workers' perceptions of these factors (Hocking, 1987). Perceived stress is often linked with MSDs and may be a primary contributor to the development of the disorder and the ability of injured workers to return to their existing work (Bongers, et al., 1993). In this study, the injured workers' (“WW” and “NWW”)

perceptions of their work environments were studied to determine whether any relationships existed between their perceptions of “social support”, “perceptions of their role limitations due to their physical and emotional well-being” and their perceptions of their “physical functioning”. Significant differences were found in the perceptions of social support in the work environment between the “WW” and “NWW.” This finding may have been a result, at least in part of the fact that the “WW” group were offered some form of duty while receiving rehabilitation, thus fostering perceptions of employer support and peer supports.

Social Support

Measurements of perceptions of social support were analyzed with results from the WES. Support was specific to the extent to which management was supportive of employees and encouraged employees to be supportive of one another (Moos, 1994). Nine questions from the WES pertained to employees’ perceptions of the social support in their work environment and ranged from such questions as supervisors’ expectations to the amount of perceived encouragement.

Social support and how the injured worker perceives support in the workplace can induce tremendous impacts on the worker’s successful return to work after injury. This concept is supported by a study of associations between perceived work conditions and musculoskeletal symptoms; with the most pronounced association seen between poor social work conditions and coexisting signs and symptoms of the upper extremity region. A study by Toomingas, et al. (1997) revealed that poor social support at work correlated with the workers’ upper extremity symptoms and signs of injury.

Social support was also found to be a positive predictor of health functioning in a study by Stansfeld, et al. (1998). The authors assessed whether certain work characteristics and social support act as predictors of psychological, physical and social functioning using the SF-36 General Health Survey with 10,308 subjects. Negative aspects of close relationships were found to be predictors of poor physical, psychological and social functioning. Interestingly, these psychosocial characteristics acted in a similar manner in both the healthy and injured workers. The authors concluded that negative aspects of close relationships could be strong independent predictors of ill health that may have a causative role that is independent of the baseline illness (Stansfield, et al., 1998). This independent predictor of close relationships may have strong associations with the injured worker's return to work as well.

Results from the current study offer additional support for the fact that perceptions of injured workers who continue to perform some type of formal work during their injury do, in fact, perceive their social support in their work environment differently than those who do not continue to work. The workers who took an indefinite time off of work during rehabilitation did not view their work environment as being supportive. Employers who offered some form of work to the injured workers during rehabilitation may have been viewed as being more supportive versus those employers who did not offer this opportunity. By offering modified work to the injured employees, the advantages seem to be clear. They include a better perception of social support, a greater likelihood of return to regular duty and/or a speedier return to work, thus, a quicker case closure and finally, a decrease in monetary costs to the employer.

Perceptions of Role Limitations Due to Physical and Emotional Well-Being

In general, people tend to go in and out of healthy and unhealthy psychological functioning throughout their lives. Whenever the worker is in a low mood while recovering from an injury or have lost faith in themselves or the employer, their tendency may be to think about their lives in ways that are not in their best interest. One of the tasks for the worker is to spend as much time as possible in a healthy psychological functioning state in order to resume normal work duties.

Role limitations due to physical well-being were determined with questions from the SF-36 and questions regarding their problems with work and their regular duties as a result of their physical health. Workers were asked questions regarding their physical health and any limitations they had with daily activities, the amount of activity accomplished and any difficulties they had performing these activities.

Limitations with activities due to the workers emotional well-being were measured by SF-36 questions that searched for disabilities in their activity performance due to emotional problems such as feeling depressed or anxious. Analysis revealed that the “WW” group did not view the limitations due to their emotional well-being any different than the “NWW” group. One interpretation may be that working simultaneous while receiving therapy does not change the worker’s perceptions of their emotional well-being. The “WW” may continue to view themselves as different since they are injured and not able to perform their normal job duties.

When Pearson’s correlation analysis were performed among the variables for each group, a significant relationship was found between emotional well-being and physical

well-being variables. Findings may implicate a common relationship between the two variables. Positive relationships are commonly seen between these two variables in a clinical setting with the injured worker. A physically impaired worker often shows signs of depression due to the sudden change in work status leading to a vicious cycle where the injury is delayed in healing secondary to the dysfunctional emotional component. The greater the physical impairment, the more likely it is that emotional impairment is witnessed.

Literature supports this relationship in many forms of injuries. In 2003, one-half of 112 patients with acute traumatic hand injuries were found to have increased levels of avoidance symptoms and half showed signs of mood disorders. Mood disorders were found to be associated with the patients need for assistance with daily activities. The study by Gustafsson, et al. revealed that early stage emotional problems were related to the consequences of both the injury and the experience of injury (Gustafsson, Amilon, and Ahlstrom, 2003).

Perceptions of Physical Functioning Over Time

The workers level of physical functioning should be of interest since it is an essential building block to other aspects of the work environment. Not only does the worker need an appropriate level of physical functioning to perform general activities of the day but needs to be able to successfully return to previous work tasks. If the injured worker perceives his or her physical ability as being poor and is unable to meet the physical demands of the job, the chance of returning to the previous level of work is diminished.

Role limitations due to physical functioning over time were measured with the SF-36 questions regarding the employee's health and their limitations with daily activities due to health. Activities were rated and ranged from vigorous to mild including lifting heavy objects and dressing themselves. Measurements were taken by studying the change from initiation of therapy to the time the workers were discharged from therapy. No differences were found in either the "WW" group or "NWW" group; therefore, those workers who continued to work during therapy did not perceive their level of physical functioning any differently than those workers who discontinued work.

Findings may have been expected to lean towards the "WW" group since they continued to work during therapy. One explanation for the actual results may be that the "WW" group was not performing regular duties and instead were considered to be on "light duty". This stigma of "light duty" may have had an altering effect on their perceptions of their role limitations due to physical functioning.

Finally, the results from this study supported the social support hypothesis (H1). Since there was a significant difference found in the perceptions of social support between the "WW" and "NWW" group, the occupational therapist may have some useful information when approaching industries or insurance companies. With continued work during therapy, this study supports the idea that workers will have a stronger sense of employer support than those who do not work. In addition, as existing research suggests, perceptions of a strong social support system will allow the employer to assume more control (Shrey, 1996) and may result in a reduction in costs (Shrey, 1996)(LWCC, 2004) by decreasing the time off of work (Crook, et al., 1998).

IMPLICATIONS FOR PRACTICE

Results of this study can have a positive impact not only with occupational therapists' perceptions of the injured worker but more specifically in the rehabilitation of the injured worker. Traditionally, therapists rehabilitate injured workers in the clinics with the primary goal of controlling pain, increasing motion, strength, coordination and the ultimate goal of returning the worker back to their previous level of employment. The role of the work environment may not have been taken into account due to time limits from reimbursement sources or limited awareness of the significance of its role. The results of this study have shown that the injured workers' perceptions of social support in their work environment may play a significant role in their ability to return to work. Also, the injured worker who maintains a working position during rehabilitation may also view the social support system at work more positively, thus increasing the chance of return to the previous level of employment. There is a complex interplay between employers, coworkers, and workers (social environment) that should be considered when helping the injured worker adapt.

Incorporating evaluations of perceptions of social support into the repertoire of practice can better facilitate the injured workers adaptive process. The therapist may also use this information to collaborate with their caseworkers and employers to suggest opportunities to create a more positive social support system in the work environment.

Other considerations are the direct relationship between the variables 'role limitations due to physical well-being' and 'role limitations due to emotional well-being.' This relationship is probably not foreign to occupational therapists since it is seen in

many other injuries as well. However, it is important to recall when treating the injured worker. Managing the injured worker requires not only the use of scientific reasoning for the physical impairments but also the practice of art when dealing with the emotional issues.

LIMITATIONS AND FUTURE RESEARCH

First and foremost, the most obvious limitation of this research is with the sampling. Subjects were selected systematically from one small area of the city. Therapy was attended in a middle to upper class suburb consisting of predominantly the upper working class. The sample size of 30 subjects may limit generalizations that may be geared towards the large population of upper extremity MSDs reported in the workplace. If additional subjects could have been interviewed and questioned from a larger population base, a better picture that accurately reflects the population of injured workers may have been produced.

The role of the investigator may also be considered somewhat of a limitation since the investigator was also the primary treating therapist. Suggestions regarding the desired results may have been made unconsciously during therapy sessions. This role of the therapist may also have skewed the subject's desire to participate in the study since all subjects who were asked to participate agreed.

Subjects used in this study also varied according to the types of jobs they performed. Future research may include studying injured employees from one industry and comparing differences in those workers who continue to work as well as those who do not. These findings may offer improved insight regarding particular types of industry

and ways to improve upon returning the injured worker back to their existing duties thus decreasing the amount of cost.

Table 1
Means and Standard Deviations for “WW” and “NWW”

Variable	Mean		Standard Deviation	
	“WW”	“NWW”	“WW”	“NWW”
Social Support	6.44	4.50	1.788	2.739
Role Limitations Due to Physical Well-Being	45.31	19.64	44.925	32.785
Role Limitations Due to Emotional Well-Being	75.92	73.81	32.702	39.610
Physical Functioning “WW”	76.56	69.64	15.992	25.227

Table 2
Correlation Matrix Among Variables (Social Support, Physical Well-Being, Emotional Well-Being) for the Working Group

	Social Support	Physical Well-Being	Emotional Well-Being
Social Support			
Physical Well-Being	.339		
Emotional Well-Being	.064	.588*	

n=16

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

Table 3
Correlation Matrix Among Variables (Social Support, Physical Well-Being, Emotional Well-Being) for the Non-Working Group

	Social Support	Physical Well-Being	Emotional Well-Being
Social Support			
Physical Well-Being	.011		
Emotional Well-Being	.154	.427	

n=14

Table 4
Difference Scores (Social Support, Physical Well-Being and Emotional Well-Being)
Between the Working and Non-Working Groups

Variables	Means		t-value	p-value
	“WW”	“NWW”		
Social Support	6.44	4.50	2.323	.028*
Physical Well-Being	45.31	19.64	1.765	.089
Emotional Well-Being	77.92	73.81	-.068	.947

* t-value is significant at the 0.05 level (2-tailed)

Table 5
Change of Physical Functioning Scores Over Time

Groups	Means		t	p
	Initiation of Therapy	Discharge		
“WW”	76.56	80.94	-1.578	.135
“NWW”	69.64	70.71	-.220	.829

CHAPTER SIX

CONCLUSIONS AND IMPLICATIONS

This dissertation was designed to further our understanding of the occupational adaptation process with the injured worker's journey back to work. It explored many aspects and issues of the work environment as well as the role of the worker's perceptions in this adaptation process. In order to better articulate occupational therapy's unique focus to other professions outside occupational therapy, the Occupational Therapy Practice Framework was used throughout the manuscript. This framework was formally approved in May 2002 as a replacement for the Uniform Terminology III in order to emphasize occupation as a means to facilitate health, well-being, and overall life satisfaction (Youngstrom, 2002).

Several findings regarding issues with return to work emerged from the research process. This chapter presents significant findings of the research; describes how these findings contribute to occupational therapy theory; discusses the implications for the injured worker and employers as well as with occupational therapists; discusses difficulties experienced during the research process; limitations with the research and describes remaining questions, concerns and possible future endeavors.

Significant Findings

Significant findings related to the three studies are summarized in this section. The first study's (chapter 3) aim was to conceptualize the social environment and its role

in returning the injured worker back to work. In 1922, Meyer described the occupational therapy environment as carefully managed and having the ability to provide patients with the opportunity to strive for meaning in their lives as well as have their needs met (Meyer, 1922). The social environment is one aspect of the environment that should become an increasingly important component of occupational therapy interventions as well as promotion of an optimal work environment. Primary concerns with this study included:

- (1) Review of the social work environment subsystem regarding return to work after injury.
- (2) Review of specific influencing factors related to the injured worker's return to previous employment:
 - a. Relationships
 - b. Work Pressure and Stress
 - c. Job Satisfaction
 - d. Control and Structural Factors

Findings of this conceptual review include an increasing awareness of psychosocial factors in the work environment and their involvement in the return to work of the injured worker. Predictive value is not only in the physical variable (mobility and strength) and medical background but can be manifested by those variables that occur in the social organization of the workplace.

Specific social organization systems that seem to appear throughout the literature are relationships, work stress, job satisfaction and overall control in the work

environment. A number of these variables can play a mediating role between illness and its effects as well as the successful return to work after injury. The literature suggests strong associations between measures of adverse social work environments including overall structural factors, relationships, stress, job satisfaction and control, their health and successful return to work following an injury.

Much of the work environment relies on the professional relationships that occur. No worker functions solely in isolation; therefore, all work relationships are built between individuals whether it is between coworkers, supervisors or outside individuals and/or customers. Relationships within the work environment can be productive as well as diminish the chances of injury and increase the percentage of injured workers who are able to return to work. Poor perception of relationships, on the other hand, may decrease the probability of the injured worker returning to his previous level of employment and may increase the risk of re-injury. Whether work relationships act as positive or negative predictors of health and return to work, they are important aspects of the environment to consider when treating individuals with work-related injuries.

The second study included the use of a combination of two research designs: qualitative and quantitative methods. Issues regarding returning to work were found to be multifactorial in nature and therefore, more suitable to be addressed with the two research designs. The essence of adaptive strategies with workers who suffered work-related injuries was explored. In order to achieve a better understanding of their adaptive strategies, the problem was approached by gaining a better understanding of the worker's perceptions of their social climate in their work environment through use of the Work

Environment Scale (WES) and Disability of the Arm, Shoulder and Hand (DASH) questionnaire. Workers were interviewed regarding their work and work environment in search of emerging themes describing their adaptive strategies with return to work.

Descriptive analysis was used to analyze the data. DASH results were interesting since all of the workers perceived their “overall function” as meaningful whereas 75% demonstrated change in their “function at work”. These DASH results were supported by the qualitative interviews. One of the workers revealed in the interviews that she was not satisfied with her work or her symptoms. Coincidentally, this was the same worker that did not perceive her “function at work” as meaningful.

Overall, the WES results showed some differences between the workers “real” and “ideal” work environment. Again, many of these differences were supported in the interviews most notably with Ms. Parks. Her WES scores showed a difference in her perceptions of “involvement”, “coworker cohesion”, “supervisor support”, and “work pressure.” In her interview, she states, “How does this work? My friends are not here. My family is not here. I don’t have anyone to talk to...” This statement indicates the importance for Ms. Parks of having some form of support in her environment.

Themes arising from the interviews that characterized the adaptive process and specific strategies included:

- (1) Importance of meaningful relationships
- (2) Importance of satisfaction with work
- (3) Importance of discovering activities outside the work environment

These themes can serve as a basic background for therapists who treat injured workers with MSDs. The worker can foster relationships at work once he returns to facilitate the adaptive process. Therapists can help the worker find aspects of the work that are satisfying and if not, help him or her determine specific aspects that are satisfying. Finally, the therapist can help the worker explore outside leisure activities that are meaningful.

Findings from this study supported the notion that individuals are not technical, mechanical beings but instead individual and extremely complex. With the complexities in mind, it is important for therapists to treat each injured worker individually taking into account that these findings only serve as guidance in treatment and facilitation of returning the worker back to his previous employment.

The purpose of the final study (chapter 5) was to compare the perceptions of workers who continue to work during rehabilitation (“WW”) and those workers who discontinue all forms of formal occupation during their rehabilitation phase (“NWW”). When reviewing the literature regarding return to work, there are multiple concerns including the length of time away from a formal occupation, the roles of the work environment as well as the worker’s perception of this environment.

Research questions for this study included:

- 1) Is there a significant difference between the “WW” and “NWW” and their perceptions of social support in the work environment at initiation of therapy?

- 2) Is there a significant difference between the “WW” and the “NWW” and their perceptions of their health and well-being (physical and emotional well-being) at initiation of therapy?
- 3) Is there a significant change in perceptions of physical functioning over time (between initiation of therapy and discharge) with the “WW”?
- 4) Is there a significant change in perceptions of physical functioning over time (between initiation of therapy and discharge) with the “NWW”?

In order to sufficiently answer these research questions, thirty workers who were diagnosed with a work-related upper extremity musculoskeletal disorder were selected conveniently to complete the Short-Form Health Survey (SF-36) and the Work Environment Scale (WES). Null hypotheses were as follows:

H1: No significant difference will be found in the perceptions of social support in the work environment between “WW” and “NWW”.

H2: No significant difference will be found in the perceptions of role limitations due to physical well-being between “WW” and “NWW”.

H3: No significant difference will be found in the perceptions of role limitations due to emotional well-being between “WW” and “NWW”.

H4: No significant difference will be found in the change over time of physical functioning in the “WW”.

H5: No significant difference will be found in the change over time of physical functioning in the “NWW”.

Analysis included a Pearson’s correlation analysis to explore the potential relationships among the variables as well as independent t-tests. These analysis revealed a significant relationship ($p<.05$) between emotional well-being and physical well-being in the working “WW” group only. Independent t-tests revealed no statistically significant differences between the two groups except for social support ($t=2.323$; $df=28$; $p<.05$).

These findings can have implications for occupational therapists when treating injured workers. The role of the work environment seems to have a significant impact that should not be ignored. These results have shown that the injured workers’ perceptions of their social support in their work environment may have such an impact that may affect their chance of returning to their previous level of employment. This may be important for the occupational therapist to understand so as to incorporate the worker’s perceptions of social support into the evaluation process. Much of these findings serve as a confirmation of the multifactorial character of many work-related injuries and underline the need for a global approach to work situations in order to successfully return the injured worker back to his or her existing jobs.

Implications for Occupational Adaptation Theory Development

The Occupational Adaptation theoretical framework used for conceptualizing the process of adaptation in this paper is developed by Schkade and Schultz (1992). Based on this theory, occupational adaptation is a normative process that focuses on the internal adaptation process of a person. It is the change of a worker’s internal state as the worker

moves toward a more functional, meaningful state of returning to work. This adaptation process is one that the injured workers move through including any interaction with their work environment. It is their response to both intrinsic (personal) and extrinsic (environmental) factors that will dictate the final outcomes. A successful response will result in “occupational performance with mastery and satisfaction” or a successful return to work.

Future endeavors based on this theory may include studying the intrinsic (personal) responses to work-related injury versus studying the environmental factors. Focus on the injured worker’s extrinsic process of adaptation in their actual environment may offer more information to the adaptation process. This type of study may be accomplished by performing a different research design other than those performed in this paper. To illustrate, exploration of the actual work environment can be explored and its influences on the workers with return to work. The researcher would use both interviews as well as participant observations as a form of data collection. Cultural themes of roles and behaviors of the workers would be explored and reported.

Implications for Injured Workers and Employers

The issue of legitimacy is a rather strong notion implying that injured workers with a MSD may not be truthful regarding their symptoms and may even be considered to be “faking it” by some. This issue can have a negative impact on the worker, possibly delaying his or her return to work. This paper can inform both the employers and employees regarding issues with return to work.

If the employers understand the complexities of the work environment, simple changes in the structure may make significant differences in the future. Differences may also be seen economically by a decrease in workers compensation costs. Workers may report fewer injuries or be less inclined to take a leave from work if they feel satisfied and happy in their work environment. Overall, employee and employer morale can significantly be improved.

Since the average worker spends a majority of his or her time in the work environment, it seems it is imperative to improve this environment in order to allow for a satisfying and quality environment. Most of the social environment includes aspects that are not costly relative to the better-known physical environmental changes. To illustrate this point, modifying the workstation so it is more “ergonomically” correct can be quite costly whereas providing employees with lunch along with 30 minutes extra to “mingle” with their coworkers and supervisors to create a tighter cohesion is inexpensive in comparison.

Implications for Occupational Therapists

Currently, a majority of occupational therapists continue to work in outpatient clinics whether it is a general rehabilitation, outpatient hand, or work hardening clinic. The injured workers often return to their previous level of employment directly from rehabilitation without a transition. Occupational therapists can act as liaisons that assist with this transition.

If the paradigm shift that was discussed in chapter 3 of this paper is actually taking place, with the injured workers being treated at the work site, occupational therapy

may play an important role within the actual work environment. Our jobs in the future may not be in hospitals or even outpatient clinics, but in the actual environments themselves working with the workers on an ongoing basis.

This shift may also offer different future research avenues to decrease the number of work-related MSD and prevent unnecessary delays when returning to work. At this time, the workers compensation system is undergoing many changes that are not only affecting the employees but the entire field of occupational therapy. Worker's compensation has recently cut back their reimbursement, in an attempt to limit all workers number of therapy visits. This may be feasible with some workers' injuries but is ludicrous for others. In an attempt to work with the compensation system, occupational therapists need to join forces and fight these limits as well as attempt to work within them when feasible. We need to understand that it may be a never-ending battle therefore, finding methods to return these workers more quickly, yet safely, back to work is essential.

Research Process

Difficulties in the research process occurred numerous times. The collection of data was sometimes tedious especially since workers were asked to fill out questionnaires that could possibly take up to 3 hours. This was not only asked once but sometimes two separate times. Obtaining follow-up data not only became challenging but an impossible task to accomplish since many of the subjects were difficult to locate and even more so in returning phone calls for scheduling. Many of the workers were asked to sit with me to describe their personal thoughts and experiences while I simultaneously recorded their

responses. It was when I began the interview process that I suddenly realized the questionnaires were the simple part. The interviews took up quite a bit of time for both the workers and myself.

One finding definitely worth mentioning is the power of the interview process. The interviews asked what I felt were simple questions regarding their return to work process but brought about a wealth of information. At some points, I found that issues in some of the workers' lives that did not directly pertain to the work environment itself may have played a causative role with the overall difficulties in returning to work. Some interviews brought forth emotional reactions such as crying, short bouts of depression, and even laughter that I never would have imagined. It was after the interviews that I realized I would have no choice but to become the primary treating therapist since I now had developed a sense of trust with each participant.

I found that some of the interviews were easier when the workers enjoyed talking about themselves while with some it was like pulling teeth. Interviews with those that enjoyed talking flowed smoothly and the themes emerged even as they spoke, while others struggled with the questions and answers. Struggles may have been due to anxiety, fears of privacy since I was recording their responses, or fear of the worker's compensation system finding out the results.

Overall, I have gained a new respect for this research tradition of qualitative design. I have come to understand that not all variables are measurable by experimental design especially MSDs because of its subjective nature. Workers who complain of

diffuse, subjective upper extremity pain and are found to have no discernible physical pathology may be better studied by qualitative means.

Limitations of this Research

While the use of qualitative design was most suited for some of the studies, it is not always the most widely accepted means of research. Subjectivity can lead to uncertainty in interpreting whether self-reports of workplace social conditions represent attributes of the environment or whether they are highly individualized perceptions. We have to take this subjectivity into account when we treat our clients. It is important to remember their uniqueness and understand it is their perceptions that help or hinder their return to work rather than the social conditions that are actually present.

Another limitation was the location of data collection. Data was collected in a private, outpatient occupational therapy clinic in the northern suburbs of Houston, Texas. A majority of the workers used for the research included Caucasians of both genders but represented an average income of greater than \$80,000. Unfortunately, this is not considered a good representation of the typical worker, so generalizations cannot be made regarding workers with a different earning status.

Implications for the Future

In the process of addressing the issues of returning to work after injury, additional questions and potential hypothesis emerged. The conceptual review of the social environment (chapter 3) discussed primarily the role of the social environment with returning the injured worker back to their existing jobs. What would the role of the

physical environment play and more importantly, the role of the method by which the physical and social subsystems come together, the cultural subsystem play?

Why do some workers return to work while others do not? Other than the obvious of the severity of the injury limiting their ability to perform their previous line of duty, there are other reasons that came to mind. Socioeconomic class may play an imperative role especially if the lower socioeconomic worker is the sole financial provider for the family. Time off of work with a lower pay or no pay may not be a choice therefore, facilitating a speedier return to work. On the other hand, the worker may be receiving a sufficient amount of finances and enjoying the time off thus diminishing the motivation to return to work. Future studies may incorporate the comparison of the lower socioeconomic workers with the more endowed and their rate of return to work.

Much of the literature reviewed came from the nursing literature, environmental psychologists, occupational environmental medicine and social sciences. Occupational therapists should continue to learn from the expertise of these fields in order to broaden our understanding of the issues involved when returning to work as well as contributing occupational therapy's expertise to these other fields. This can be done by performing research using occupational therapy theory as an underlying construct in combination with the practice framework in an attempt to publish our results in other disciplines' journals.

In conclusion, there is a plethora of injured workers sitting at home now waiting to return to work. How they perceive their injuries and work environment is in no way fully understood, and therefore, there is much to be learned about this topic.

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APPENDICES

APPENDIX A

IRB Approvals

TEXAS WOMAN'S UNIVERSITY

DENTON DALLAS HOUSTON

Institutional Review Board

1130 John Freeman Blvd., Houston, Texas 77030 713/794-2074

MEMORANDUM

TO: Josephine Chan
Jade Strong

FROM: IRB

DATE: April 12, 2002

SUBJECT: IRB Application


Proposal Title: Adaption to work-related injury

Your application to the IRB has been reviewed and approved

This approval lasts for 1 year. If your study extends beyond that time you must notify the Human Subjects Review Committee.

REMEMBER TO PROVIDE COPIES OF THE SIGNED INFORMED CONSENT TO ME WHEN THE STUDY HAS BEEN COMPLETED. GRADUATION MAY BE BLOCKED UNLESS CONSENTS ARE RETURNED.

Thank you for your patience in awaiting the committee's decision. The committee extends its best wishes for a productive and very successful project. Should you have any further questions about your application, please contact me at 713-794-2074


William P. Hanten
Chairperson

TEXAS WOMAN'S UNIVERSITY

DENTON DALLAS HOUSTON

Institutional Review Board

1130 John Freeman Blvd., Houston, Texas 77030 713/794-2074

MEMORANDUM

TO: Josephine Chan
Jade Strong

FROM: IRB

DATE: February 16, 2004

SUBJECT: IRB Application

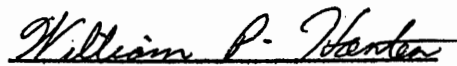
Proposal Title Adaptation to work-related injury

Your application to the IRB has been reviewed and approved.

This approval lasts for 1 year. The study may not continue after the approval period without additional IRB review and approval for continuation. It is your responsibility to assure that this study is not conducted beyond the expiration date.

Any changes in the study or informed consent procedure must receive review and approval prior to implementation unless the change is necessary for the safety of subjects. In addition, you must inform the IRB of adverse events encountered during the study or of any new and significant information that may impact a research participant's safety or willingness to continue in your study.

REMEMBER TO PROVIDE COPIES OF THE SIGNED INFORMED CONSENT TO THE OFFICE OF RESEARCH, MGJ 913 WHEN THE STUDY HAS BEEN COMPLETED. INCLUDE A LETTER PROVIDING THE NAME(S) OF THE RESEARCHER(S), THE FACULTY ADVISOR, AND THE TITLE OF THE STUDY. GRADUATION MAY BE BLOCKED UNLESS CONSENTS ARE RETURNED.



William P. Hanten
Chairperson

APPENDIX B

Consent Forms

Consent to Serve as a Subject for a Study of Adaptation to Work-Related Injury

- (1) Jade Strong, MOT, OTR, CHT is authorized to involve subjects in the Study of Adaptation to Work-Related Injury. The purposes of the study are
- (a) to examine how the process of adaptation to an upper extremity work-related injury changes over time, and (b) to identify work environment factors that influence the adaptive process. Subjects will be asked to take part in the study during the time they are attending outpatient hand therapy and one additional time after therapy has been completed. Therapists will provide outpatient therapy in the usual way for persons with similar injuries, and therapy will not be changed due to the involvement in the study. One additional questionnaire will be completed via mail or a visit in a community location.

Each subject will provide the following kinds of information:

- (a) release of information from the clinical chart including personal information (age, onset of injury, occupation, leisure activities, exercise, and assistive devices)
- (b) completion of two written questionnaires about pain, ability to perform job and self-care activities, current health, and injury perceptions as well as feelings about the work environment. Answering these questionnaires will take about thirty minutes each time and will be completed at the beginning of therapy, prior to discharge and four months from the initial collection. This would mean a total of 1 hour and 30 minutes.
- (c) possibility of being chosen to complete an audiotaped interview that will discuss life before and after the injury, roles in the work place, changes in work performance that may have occurred as a result of the injury and injury adaptation. Subjects may or may not be asked to complete these interviews. Interviews will take between 30-60 minutes each time and will be completed at the beginning of therapy, prior to discharge and four months from the initial collection. A possible maximum total of 3 hours may be needed. These interviews will be audiotaped and a written record of the interviews will be typed from the audiotapes. Audiotapes will be kept in a secure locked file at Texas Woman's University Occupational Therapy Department.

The total participation time in the study may take up to 4 hours and 30 minutes over a four-month period, at times and locations that are scheduled at the subject's convenience.

- (2a) The procedures described above involve the following possible risks:
- (a) Emotional discomfort in answering some questions. Questions that may make the subjects uncomfortable do not need to be answered.

- (b) Adding time to the daily schedule or outpatient therapy to complete questionnaires and interviews. Additional times and locations for gathering information will be arranged at the subject's convenience.
 - (c) Loss of confidentiality of written information from the study. Information about the subjects will be recorded using a code number. This information will be kept in locked files and will be used only for research and educational purposes without use of any names.
- (2b) There will be no benefit to the subjects from participation in this study. Knowledge gained from this research may help health care personnel provide better services to other persons with similar injuries in the future.
- (2c) The researcher will attempt to prevent any problem that may occur due to the research. The researcher should be notified immediately if a problem arises. Texas Woman's University does not provide medical services or financial assistance for injuries that might occur due to this research.
- (3) Questions about the research or about rights, as a subject should be directed to the researcher. The phone number is #713-385-8443. If additional questions remain or a problem needs to be reported, the Office of Research phone number is #713-794-2480.
- (4) Questions or concerns about the study will be answered. Descriptions of the possible discomfort and risks expected will be discussed with all subjects. Subjects may stop taking part in the study at any time without penalty.

Subject's Signature

Date

Study of Adaptation to Work-Related Injury
Consent to Record

Jade Strong, MOT, OTR, CHT, acting under the authority of Texas Woman's University, will record subjects' voices for the purposes of the research project entitled "Adaptation of Work-Related Injury". The material recorded for this research project may be made available for educational and/or research purposes.

Participant

Date

The above form was read, discussed, and signed in presence of an authorized representative. The person signing the consent form did so freely and with full knowledge and understanding of its contents.

Authorized representative of the
Texas Woman's University

Date

APPENDIX C

Publication Correspondence

Jade Strong, MOT, OTR, CHT
Texas Woman's University Doctoral Student
Private Practice: The Woodlands Hand Rehabilitation Center
11210 Falconwing Drive
The Woodlands, Texas 77381
vjstrong@swbell.net

Dear Ms. Strong:

Thank you for submitting your manuscript entitled, ***A CONCEPTUAL MODEL OF THE SOCIAL WORK ENVIRONMENT AND ITS ROLE WITH RETURN TO WORK FOLLOWING INJURY*** to ***WORK: A Journal of Prevention, Assessment & Rehabilitation***.

The feedback from the peer reviewers was fair to middling, such as, "Getting people back to work is always timely." There was a general concern that your manuscript did not present any new information and that an adequate thesis was not developed. In fact it was noted that the manuscript is about an entirely different topic than originally stated. These concerns must be addressed in the revision of your manuscript before it can be sent out again for re-review. In addition, this correspondence also includes one edited manuscript and a reviewer's feedback form. Please incorporate these editorial changes into your revised manuscript, too.

Please make these editorial changes and then e-mail me your revision. Once I have received your revised manuscript, I will send it out for a re-review and have feedback to you within four weeks.

Please let me know if you will be revising your manuscript and when I might be receiving it.

Thank you for submitting your manuscript. I look forward to receiving your revision.

Sincerely,

Karen Jacobs, Ed.D. OTR/L, CPE, FAOTA
Editor, ***WORK: A Journal of Prevention, Assessment, & Rehabilitation***

Jade Strong

From: Mary Corcoran [ajoteditor@cox.net]
Sent: Monday, September 20, 2004 4:50 PM
To: vjstrong@swbell.net
Your AJOT manuscript

manuscript was received and the review process has been initiated. You can expect further correspondence from the editorial office in 2-3 months. Please refer to your No. 04-136 in all future correspondence. Thank you for submitting this to AJOT.

Corcoran

Dear Ms. Strong,

Thank you for submitting the manuscript “Patients’ Adaptive Experiences of Returning to Work Following Musculoskeletal Disorders: A Mixed Design Study” to the Journal of Hand Therapy Qualitative Series. We have sent your manuscript out for the usual review process. Enclosed are the original comments from the three reviewers.

Summary of recommendations from the reviewers:

- (1) Modify the contents and address the arguments to hand therapists; in addition to occupational therapists.
- (2) Clarify and explain the concepts and connections between “return to work” and “adaptation process” in the literature review. Tie them together in the discussions.
- (3) Clarify the connections between the qualitative and quantitative data. Specify the similarities and differences.
- (4) Specify the themes emerged from the qualitative data.
Retrieve quotes from the data to support your findings.
- (5) Editorial changes
Check grammar and language use.

We will be glad to bring the manuscript to publication if you can respond to the above changes as recommended by the reviewers.

Sincerely,

JHT Qualitative Series Guest Editors:

Josephine Chan, PhD, OTR, CHT

Jean Spencer, PhD, OTR, FAOTA

MEMORANDUM

TO: Dissertation Committee

FROM: Jade Strong

DATE: June 30, 2004

RE: Response to feedback from the *Journal of Hand Therapy* re: submission of
Chapter Four: Patients' Adaptive Experiences of Returning to Work
Following Musculoskeletal Disorders: A Mixed Design Study

This memorandum describes changes that were made to Chapter Four in response to submission to the *Journal of Hand Therapy*. My understanding of the response from the *Journal of Hand Therapy's* editors is they are interested in the publication of this work but would like to see a richer more thorough background relative to the notion of adaptation as well as having an overarching theoretical basic construct. Comments and responses included:

- *Comment 1*: Statement of significance of the problem does not explicitly link etiology to a patient's experience of musculoskeletal disease (MSD) and their adaptation to work.
- *Response 1*: Extensive literature was reviewed in search of the adaptive experiences of injured workers. After reviewing the literature, the problem was rewritten so as to link the injured workers' experiences with MSD and their adaptation strategies utilized with return to work.

- *Comment 2:* The need for this study was not established in the purpose or introduction.
- *Response 2:* The literature was explored with findings that resulted in limited research conducted with this specific work-related injury and their experiences. This was written in the introduction as well as in the purpose of the research.
- *Comment 3:* While it is stated that the sample is purposive, there is no explanation as to how it is.
- *Response 3:* Creswell (1998) chapter on qualitative research design sample collection was reviewed and used as a reference to state the purpose as well as how and why the sampling was performed.
- *Comment 4:* The number of interviews is unclear. Adaptation is theorized to occur in stages – interviewing these participants twice would have been very appropriate; a very rich description of the adaptive experience would have been elicited.
- *Response 4:* The number of interviews was made clear and consistent within the manuscript. The interviews were performed twice and stated clearly within the methodology section.
- *Comment 5:* The analysis method used for the qualitative data is not clearly stated.
- *Response 5:* The analysis method was rewritten making it more clear as how the analysis took place.

- *Comment 6:* The link between the cause of upper extremity MSD and the adaptive response needs to be made explicit.
- *Response 6:* This link was made more specific by expanding the basic theoretical concept of Occupational Adaptation as well as any link between the injured workers' adaptive strategies.