STRESS, COPING, AND PSYCHOLOGICAL ADAPTATION OF INDIVIDUALS WITH POST-POLIO SEQUELAE

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Submitted to the Faculty of the
Graduate College of the
Oklahoma State University
in partial fulfillment of
the requirements for
the Degree of
DOCTOR OF PHILOSOPHY
December, 1996

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ACKNOWLEDGMENTS

I wish to express my sincere gratitude and appreciation to my committee chair, mentor, and friend, Dr. C. Richard Potts for teaching me most of what I have learned about research and especially for providing me much needed support during difficult years in graduate school. Special thanks are also extended to Dr. John Chaney who was an integral part of both my clinical and research training. I would also like to thank my other committee members, Dr. Larry Mullins and Dr. Alfred Carlozzi for their time and effort in the completion of this project.

In addition, I would like to thank Susan Haase who was the inspiration for this study, members of the Oklahoma City Postpolio Support Group who gave of their time and funds, Frank Thurber who provided his respected endorsement of the project, and subscribers of the Internet Postpolio News group who participated in this research.

I would like to give special thanks to my family members for their caring support throughout my many years in higher education. In particular, I wish to express many thanks to my mom, Adrienne Gombas who has always encouraged and believed in me, and who's loving support has seemingly grown over the years.

Special appreciation also goes to Karl Gruenewald who provided consistent emotional support, motivation, data entry, and access to recruiting Internet participants. Finally, thanks go to Maria Ast-Sheldon, Isaac Martinez, Patricia Alexander, and Molly Tovar for their dear friendship and support through this process.

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CHAPTER I

INTRODUCTION

An estimated 1.63 million individuals have contracted poliomyelitis in the United States (Agre, Rodriquez, & Sperling, 1989). The effects that emerge 20 to 30 years after the acute phase of poliomyelitis such as fatigue, muscle weakness, and joint and back pain have been mentioned in the medical literature for over 100 years. Unfortunately, it has not been recognized as a legitimate constellation of symptoms until the last decade. The most widely accepted term used for these late effects of poliomyelitis is post-polio sequelae (PPS). The etiology of the debilitating condition is unclear. In addition, treatment merely serves to manage the symptoms of PPS; there is no cure. It is not surprising that many individuals with PPS are confused, frightened, and weary of the medical community.

Since the recognition of PPS as a viable disorder, many researchers have focused much of their attention on the biomedical aspects of PPS. However, investigators are also beginning to study concomitant psychological difficulties of the disorder. For instance, Conrady, Wish, Agre, Rodriquez, and Sperling (1989) found evidence that PPS individuals reported significantly high levels of depression, anxiety, hostility, somatization, and phobias. Also, Bruno and Frick (1991) have speculated that PPS individuals developed Type A and compulsive behavior patterns as a result of their initial battle with poliomyelitis. They describe many PPS individuals as goal-oriented, time-pressured, hostile, overachievers, and as having an atypical need for control in their lives. Although it is possible that PPS individuals developed the maladaptive patterns of behavior during the initial bout of poliomyelitis, the conclusions are based on historical information that is not easily validated. Thus, it is important to gather current empirical data regarding the factors which may contribute to psychological distress in this population. The field of behavioral medicine tells us that psychological factors associated with chronic illness can have a profound impact in the lives of these individuals. Studies have clearly shown that daily life stressors are more strongly associated with psychological adaptation than are major life events (Pearlin, Lieberman, Menaghen, & Mullan, 1981). One approach of research regarding the psychological aspects of PPS could involve current coping strategies utilized by these individuals. Therefore, it was of interest in this study to investigate how PPS persons cope with life's daily stressors.

The coping-and-stress theory of Lazarus and Folkman (1984) guided the current research. In this view, coping was conceptualized as a process that is dependent on person factors as well as the environment. In essence, the person brings particular thoughts, feelings, and abilities to each specific stressful context. According to the theory, individuals cognitively appraise each stressful event during the coping process, then decide which coping strategies they will use. The multitude of ways in which people cope is conceptualized into two categories, problem-focused and emotion focused coping. Problem-focused coping involves an action on the environment or on oneself in order to change the stressful situation. Emotion-focused coping aims to manage emotional distress. Thus, this study will investigate the cognitive appraisals of persons with PPS and how they relate to the chosen coping strategies.

The chosen coping strategies also depend on the environment, or the particular context in which the stressful event occurs. For instance, Folkman and Lazarus (1980) found that the work context elicited more problem-focused coping than did health or family related contexts. Also, data indicated that health-related contexts elicited more emotion-focused coping than did work or family related situations. The present study focused on PPS individuals' daily life stressors. Daily life stressors were defined as events appraised by the individual as exceeding the person's ability to easily manage the situation. Stressors within two contexts were studied. The first context included daily life stressors that are directly related to PPS (PPS-related). The second context included daily life stressors that were not related to PPS (non-PPS-related).

In sum, the purpose of this study was to investigate the relationship between coping with daily life stressors and psychological adaptation in persons with PPS. Psychological adaptation referred to these individuals' overall social-emotional well-being. Each stressful encounter was evaluated for cognitive appraisal, context, and coping strategies utilized. Cognitive appraisal consisted of the PPS individual subjectively evaluating the stressful event as controllable or uncontrollable. The two contexts under investigation were categorized as either PPS events or non-PPS-related events. Finally, the particular coping strategies utilized for each encounter were evaluated in relation to PPS individuals' well-being. It was the contention of the present study that how PPS individuals cope with daily life stressors has a direct relationship to their psychological adaptation. It was hoped that a better understanding of this relationship would guide clinicians' treatment protocols so that a "best fit" can be made between stressor and coping strategy.

The following review of the literature will provide the necessary background for this investigation. To begin, the pathogenesis of poliomyelitis will be covered followed by the physiological and psychological aspects of PPS. Finally, an overview of coping research will be presented.

CHAPTER II

REVIEW OF THE LITERATURE

Poliomyelitis: History and Pathogenesis

Prior to 1955, poliomyelitis was a major cause of death among children and young adults in developed countries. There were serious epidemics in the United States during 1936, 1937, 1941, 1944, 1946, 1949, 1951, 1952, and 1954 (Langmuir, 1958). It is estimated that over 500,000 individuals contracted polio during those epidemics (Bruno, 1985). In 1955, Dr. Jonas Salk developed the inactivated polio virus vaccine (IPV) and widespread immunization began. This was followed in 1960 by a live, attenuated oral polio virus vaccine (OPV) developed by Dr. Albert Sabin. The results of the immunization were spectacular. Incidence of polio declined rapidly each decade, such that between 1973 and 1981 the average annual number of reported cases in the United States was fewer than 15 (PSI International, 1986).

Poliomyelitis occurs as a result of a generalized viral infection that has an affinity for anterior horn cells (motor neurons). The virus is a single-stranded RNA enterovirus (picornavirus) and has three antigenically distinguishable viruses. Transmission is by human contact, and most people contract the virus by ingestion. If the virus crosses the blood-brain barrier, it attacks almost all of the anterior horn cells in the brain, brainstem, and spinal cord (Smith, 1990). During the acute phase of the disease, Wallerian degeneration occurs and the muscle fibers associated with those anterior horn cells become "orphaned." The result of the degeneration causes atrophy, weakness of muscles, and paresis or paralysis (Agre, Rodriquez, & Tafel, 1991). A second type, bulbar poliomyelitis, infects the medulla oblongata and may result in dysfunction of the swallowing mechanism in addition to respiratory and circulatory distress (Birk, 1993).

Following the acute phase of polio, the 100 to 1000 anterior horn cells to a particular muscle might be unaffected or recovered, all of the anterior horn cells to a muscle could be destroyed, or the muscle could be partially denervated with combinations of recovered and destroyed anterior horn cells. Studies of post-polio patients indicate that an average of 50% of the anterior horn cells never recover from the attack of the polio virus (Smith, 1990). During recovery, the increase in muscle strength occurs via several physiological processes. For instance, recovered anterior horn cells develop terminal axon sprouts to reinnervate orphaned muscle fibers. These innervated muscle fibers can be hypertrophied by exercise and activity during the rehabilitation phase. This has been referred to as myofiber hypertrophy. Another process which provides an increase in functional ability and apparent increase of strength is called neuromuscular learning, whereby practice of an exercise or activity leads to increased skill and performance without necessarily increasing muscle strength. An additional process entails the increased recruitment of the giant motor units with use of the muscle at high levels of its capacity. This final neuromuscular adaptive mechanism refers to a fiber type transformation from type II (fast twitch, glycolytic) fibers to type I (slow twitch, oxidative) fibers. Overall, the rate and level of recovery from poliomyelitis depends upon several factors, such as the severity of the initial onset, the age of initial onset of the disease, and whether the individual sought aggressive rehabilitative services (Smith, 1990). Bruno and Frick (1991) reported that most post-polio individuals recovered quite well and assimilated into mainstream society without obvious physical indicators of the illness.

Treatment and Psychological Aspects

Common treatment regimens for poliomyelitis during the 1940's and 1950's often entailed extensive, strenuous physical rehabilitation. One such treatment was based on the work of Sister Kenny of Australia who advocated moist heat to reduce spasms and prevent contractures. Physical rehabilitation involved both active and passive range-of-motion warm water exercises in Hubbard tanks. Individuals who suffered from bulbar polio also underwent rehabilitation to relearn how to eat and drink (Smith, 1989).

Many children endured the grueling treatments away from their homes and families at rehabilitation centers where they were often isolated, quarantined, and feared (Smith, 1989). They were taught the "no pain, no gain" motto and pressed themselves to shed their assistive equipment or devices (Goodwin & Potter, 1990). Some individuals worked their way out of braces and appeared fully recovered, whereas others adapted to using assistive technology devices. Typical recovery from poliomyelitis reaches its peak after 2 to 3 years. The extensive recovery of many individuals' motor functioning is deceptive. It appears that the compensatory physiological processes hide profound neurological deficits caused by the disease. This was dramatically demonstrated by counting the number of anterior horn cells in the spinal cords of postpolio individuals who died from other causes. When the percentage of cells present was compared with previous muscle test grades, it was found that muscles graded as 5 (N) could have lost up to 60% of their anterior horn cells. Muscles previously graded 4 (G) had lost 60% to 90% of their anterior horn cells and muscles graded 3, 2, and 1 (F, P, T) lost 90% to 98% of their cells (Smith, 1990).

Bruno and Frick (1987) have speculated on the psychological effects of acute poliomyelitis and its subsequent recovery. They hypothesized that aggressive treatment and rehabilitation procedures used during the epidemic years may have had deleterious effects on the psychological development of the children. They believe that many children may have adopted a perfectionist ideal which then developed into behaviors characteristic of Type A personality (i.e., hostility, impatience, perfectionism, irritability). This perfectionist ideal is thought to be exacerbated by the societal stigma of disability. Thus, it is also believed that many polio survivors did not accept the disabling condition and strived to appear as "non-disabled" as possible despite chronic pain, weakness, and fatigue.

Post-Polio Sequelae: Physiological Overview

Poliomyelitis is considered a chronic illness. Following an acute phase of the illness and a period of rehabilitation, individuals usually achieve a plateau of recovery which then remains stable. However, it appears that approximately 25% of polio survivors are experiencing new problems related to their original bout of poliomyelitis decades ago (PSI International, 1986). Several terms have developed to describe these emerging symptoms (e.g., late effects of poliomyelitis, post-polio sequelae, post-polio syndrome, post-poliomyelitis syndrome, post-poliomyelitis muscular atrophy, progressive post-poliomyelitis muscular atrophy). Each term refers to a slightly different set of symptoms. For consistency in this study, the term post-polio sequelae will be utilized. Post-polio sequelae (PPS) is a general term referring to the late-onset of symptoms in polio survivors that: 1) can be attributed directly to damage caused by the polio virus (e.g., cold intolerance or progressive respiratory insufficiency); 2) are thought to be related to the body's failure to maintain the level of recovery that was achieved following the polio infection (e.g., new fatigue or muscle weakness; or 3) result from a polio-related disability (e.g., carpal tunnel syndrome secondary to years of crutch walking) (Bruno, 1985).

Diagnosis of PPS is essentially one of exclusion. Proposed diagnostic criteria include: 1) a credible history of poliomyelitis, 2) partial recovery of function, 3) a minimum ten-year period of stabilization of this recovery following acute polio, and 4) the subsequent development of progressive muscular weakness for which there is no identifiable cause other than polio (Codd & Kurland, 1985). It is important to rule out other causes of the individual's symptoms, such as diabetic or other neuropathy, amyotropic lateral sclerosis, Guillain-Barre syndrome, heavy-metal toxicity, or neuromuscular syndromes associated with cancer (Goodwin & Potter, 1990). Finally, the changes in their neurological and functional status must not be fully accounted for by the normal effects of the aging process.

The effects of PPS are similar to those of the disease which occurred during the acute phase of poliomyelitis (Laurie, Maynard, Fischer, & Raymond, 1984). Symptoms include a combination of neurological and musculoskeletal manifestations. The most common physical problems are profound fatigue, muscle and joint pain, and new weakness with a decrease in function. Additional physical manifestations include muscle fasticulations and cramps, hyperventilation, swallowing difficulties, sleep disturbances, and cold intolerance (Agre, Rodriquez, & Tafel, 1991; Fischer, 1985; Berlly, Strauser, & Hall, 1991; Foster, Berkman, Wellen, & Schuster, 1993; Perry & Fleming, 1985; Smith, 1990; Wiechers, 1985). These physical problems associated with PPS have a direct adverse affect on these individuals' activities of daily living.

The etiology of these new symptoms is unknown (Goodwin & Potter, 1990). However, factors at the onset of acute poliomyelitis which predict the subsequent symptoms of PPS include: 1) being hospitalized, 2) being over 10 years of age at the initial onset of the disease, 3) being on a ventilator during convalescence, and 4) having paralytic involvement of all four limbs (Halstead & Rossi, 1985). In essence, age of onset and severity of the acute stage are the best predictors of PPS later in life.

Although no definitive cause for PPS has been found, several hypotheses have been posited regarding the new muscle weakness. The most parsimonious hypothesis suggests that normal age-related losses of anterior horn cells reduces the already diminished pool, and that these reductions lead to new muscle weakness. Another hypothesis refers to the damaged anterior horn cells. Dalakas et al. (1986) believe that muscle weakness in PPS is caused by dysfunction in the surviving anterior horn cells which can no longer support the metabolic needs of the distal axonal sprouts. Another possible cause of weakness is recurrent overuse of already weak muscles, which leads to damage to the muscle and supporting tissues, leading to further permanent loss of function. Overuse is also the likely cause of much of the experienced muscle and joint pain. The physiological basis for fatigue symptoms is unknown (Baker, 1989).

Treatment of PPS

Treatment of PPS entails symptom management utilizing adaptive equipment and making lifestyle changes. The "use it or lose it" dictum of the 1940's and 1950's no longer applies to the post-polio population. It appears that strenuous exercise is contraindicated and serves to harm the already weakened muscles. It is recommended that these individuals utilize non-fatiguing exercise such as swimming in warm water to balance against the general deconditioning effect of excessive rest (Feldman, 1985; Maynard, 1985; Yarnell, 1989). Continuing to walk without assistive technology devices has become too difficult for many PPS individuals. It is recommended that they use additional or new assistive devices and the appropriate bracing of weak and abused joints in order to reduce symptoms and maintain existing function (Smith, 1989). Finally, many individuals with PPS must make major lifestyle changes. This means adhering to a weight reduction regimen, making changes in their daily schedule such as decreasing difficult and taxing activities, taking frequent rests during the day, and delegating tasks to family members or helpers (Yarnell, 1989; Young, 1989). These changes in lifestyle often make persons with PPS feel as if they are becoming disabled for a second time via the same disease (Frick & Bruno, 1986).

Psychological Aspects of PPS

In addition to the physical symptoms of PPS, the literature indicates a plethora of psychological distress associated with a second disability. According to Frick and Bruno (1986), in many instances the psychological trauma associated with post-polio sequelae may be more damaging than the physical problems. Several authors have speculated on the devastating psychological effects of PPS.

First, neither persons who had polio nor their physicians knew there was any potential for additional symptoms to occur, and for many years post-polio patients were told that there was nothing wrong with them and that the reported symptoms were all psychological. These individuals felt isolated without any medical or emotional support (Frick, 1985). Second, the etiology of the new symptoms is unknown. Like other unpredictable chronic illnesses of unknown origin (e.g., rheumatoid arthritis) persons with PPS are susceptible to coping difficulties (Foster et al., 1993). Finally, society devalues individuals with disabilities (Frick, 1985). Persons with PPS may feel inferior to able-bodied people and work hard to compensate or to appear as if they are not disabled.

Despite their condition, the majority of persons who acquired polio have succeeded in minimizing the appearance of disability and maximizing their independence. As a group, they have more years of formal education and a larger proportion of them are married as compared to the general disabled and non-disabled populations (Bruno & Frick, 1991). Also, these individuals have a higher rate of employment compared to the general disabled population.

It has been suggested that post polio individuals developed Type A behavior patterns in response to their struggle with acute polio. Type A persons are characterized as having a strong need to control situations. They also seem to obtain their rewards from achievement and ambition rather than from socializing. Often these characteristics manifest in certain feelings and behaviors such as fear, anger, hostility, speedy and urgent striving efforts, and competitiveness (Hammond, 1991). Frick and Bruno (1991) have identified a constellation of similar characteristics they often found present during interviews of persons with PPS. These characteristics are as follows: 1) a pervasive pattern of continuous and excessive goal-oriented behavior beginning in childhood or adolescence, 2) anxiety increases in reaction to any decrease in goal-oriented activities or changes in daily schedule, 3) refusal to delegate responsibility associated with a strong need to be in control, 4) excessive time consciousness, 5) extreme sensitivity to criticism with a constant expectation of failure and rejection, and 6) the inability to express emotion, with the exception of anxiety, anger, and sadness. Bruno and Frick have suggested that PPS persons have developed these patterns of behavior as a result of behavior patterns established while overcoming the initial bout of poliomyelitis.

Empirical findings on the psychological aspects of PPS reveal significant problems in living. For instance, Bruno and Frick (1991) reported elevated depression scores, increased instances of Type A behavior patterns, and increased sensitivity to criticism and failure among PPS individuals. Conrady et al. (1989) found that PPS individuals had significantly elevated scores on a number of subscales such as somatization, depression, anxiety, hostility, phobia, and psychoticism. Mullins, Chaney, Albin, Miles, Hartman, and Roberson (1995) found similar indicators of distress in PPS individuals, such as depression, anxiety, obsessive-compulsive tendencies, and somatization.

Clearly, many individuals with PPS have not adapted well to their second disability. Unfortunately, little empirical research has been done on the factors associated with poor psychological adaptation. Therefore, this investigation sought to describe potential factors in the psychological adaptation of persons with PPS. The factors chosen for this study concerned coping efforts in daily living. Coping patterns are important because studies have shown that ongoing stressors in daily life have a stronger relationship to psychological adaptation than do the impact of major life events (Pearlin, Lieberman, Menaghan, & Mullan, 1981). With a better understanding of how coping with everyday stressors is related to the psychological well-being of PPS individuals, clinicians will be better equipped to treat these people when problems in living become overwhelming.

Overview of Stress and Coping

The following section will review two major approaches to coping, one that emphasizes style (the psychoanalytic ego psychology model) and one that focuses on coping as a process (the stress-and-coping model). This will be followed by principles of the coping process and several definitions of the key concepts, including stress, coping, and cognitive appraisal. Next, the measurement of coping style and coping process will be discussed. Finally, a summary of how coping is related to psychological adaptation will be presented.

The Psychoanalytic Ego Psychology Model

Historically, the psychoanalytic ego psychology models have dominated coping theory and measurement. The purpose of these models has been to classify people in order to make predictions about how they will cope with some or all types of stressful encounters. This model results in a view of coping as a style or trait. A coping style refers to broad, pervasive, encompassing ways of relating to people and situations. For example, a person may be classified as a conformist, obsessive-compulsive, a suppresser, or sublimator (Lazarus & Folkman, 1984).

When coping is conceptualized as a style, the associated models often emphasize a hierarchy of coping responses. It is presumed that some forms of coping are more healthy, or less regressed, than others. For instance, one model proposed a tripartite hierarchy with coping as the most healthy way of dealing with a stressor, defense as a neurotic process, and ego-failure as the most pathological adaptive response (Haan, 1969). Another ego model asserts that each form of psychopathology is associated with a particular defensive coping style (Rapaport, Gill, & Schafer, 1945). For example, hysterical neuroses were linked to repression, obsessive-compulsive behaviors to intellectualization and undoing, and paranoia to projection.

The conceptualization of coping as a style or trait has several problems. First, the assessment of broad, stable coping styles has had very little predictive value with respect to how individuals actually cope in particular situations (Lazarus & Folkman, 1984). Second, this view of coping assumes that people are behaviorally and cognitively consistent across situations (Folkman & Lazarus, 1980). However, several studies have found significant variation in coping responses across situations (Billings & Moos, 1981; Folkman, Lazarus, Gruen, & DeLongis, 1986). It appears that people quite often vary their coping patterns. For example, Folkman et al. (1986) found that a sample of 150 community-residing adults utilized up to seven distinct strategies for coping in each stressful encounter.

This is not to say, however, that there are no stabilities in coping or that people do not have preferred ways of coping with the same or similar stressful situations over time.

In the Folkman et al. (1986) study of 150 adults, emotion-focused forms of coping were moderately stable over a sample of five different stressful encounters. It is believed that the more similar the context, the more consistent the coping strategies will be.

Another problem with the style view of coping is that it treats the relationship between emotion and coping as if it were unidirectional; in essence, that emotional states influence coping responses. However, Folkman and Lazarus (1988) assert that emotions can facilitate or interfere with coping as well as affect immediate emotional reactions and long-term adaptational outcomes. Thus, coping appears to be more accurately viewed as a bi-directional, systemic process wherein coping has an impact on emotion and emotion has an impact on coping responses.

Finally, the psychological models that view coping as a style underestimate the complexity of actual coping efforts. Specifically, these models do not take into account the way in which the individual appraises the stressor or the context in which a stressful event occurs. This is a major omission, as both variables appear to be important factors in the coping process. Folkman and Lazarus (1980) found that coping varied in relation to whether the situation was appraised as controllable or uncontrollable and varied in relation to context of the situation. Problem-focused coping was used more in situations appraised as controllable; emotion-focused coping was used more in situations appraised as uncontrollable. With regard to the context, stressful situations in the workplace elicited more problem-focused coping, whereas health and family related stressful encounters elicited relatively more emotion-focused coping strategies.

Stress-and-Coping Model

An alternate approach to the conceptualization of coping as a style is to treat coping as a process. In this view, coping changes over time and in relation to cognitive and contextual factors. Folkman and Lazarus (1984) have elaborated on such a concept known as the stress-and-coping model. It is a relational model wherein the person and the environment are taken into account during each coping effort. This means that in every stressful situation, factors within the individual and factors in the environment combine in a way which creates a problem for the individual. The problem is then coped with in a particular manner. In general, the behavioral flow of this model begins with an event in a person's environment that is appraised as stressful. The appraisal process generates emotion. The appraisal and its associated emotion influence coping responses to the event. After the stressful event is coped with, the person reappraises the situation. This reappraisal leads to a change in emotion quality and intensity. In this view, coping is a mediator of the emotion response (Folkman & Lazarus, 1988).

Stress is defined as an event that is appraised by the person as taxing or exceeding the person's abilities and as endangering well-being (Lazarus, 1993). The model also identifies two processes (cognitive appraisal and coping) as essential mediators between the stressful event and the immediate as well as the long-term outcomes. Cognitive appraisal refers to the way in which an individual evaluates what, if anything, can be done about the specific stressful situation. Essentially, the person subjectively assesses to what degree the situation is controllable or uncontrollable. In this phase of the process, several potential coping strategies already in the person's repertoire are evaluated.

Coping is conceptualized as a person's cognitive and behavioral efforts to manage (e.g., reduce, minimize, master, or tolerate) the internal and external demands of the person-environment transaction that is appraised as taxing or exceeding the person's resources (Lazarus & Folkman, 1987). According to the model, coping has two major functions: 1) to alter the person-environment relationship by acting on the environment or oneself (problem-focused coping) and 2) to manage emotional distress (emotion-focused coping).

Problem-focused coping is more often used when stressful conditions are appraised as controllable by action. These problem-focused strategies include confrontive coping and planful problem solving. Confrontive coping describes aggressive efforts to alter the situation and suggests some degree of hostility and risk-taking. An example of confrontive coping is standing one's ground and fighting for what one wants. Planful problem solving refers to using analytical, problem-focused efforts in order to change a situation, such as making a plan of action and following it. These ways of coping are considered active strategies relative to emotion-focused strategies.

Emotion-focused coping is more often utilized when stressful conditions are appraised as uncontrollable. The emotion-focused forms of coping include distancing, self-control, accepting responsibility, and positive reappraisal. Distancing involves cognitive efforts to detach oneself and to minimize the significance of the situation. For instance, an individual may choose to distance him or herself from a stressful encounter by making light of the situation. Another person may cope by utilizing self-control efforts to regulate one's feelings, and actions such as keeping others from knowing one's feelings. Others may accept responsibility for the stressful encounter by acknowledging their own role in the problem with a concomitant theme of trying to make amends. Finally, positive reappraisal describes efforts to create positive meaning by focusing on personal growth. For example, individuals may cope with a stressful situation by telling themselves that they came out better than they went into the experience.

Two other strategies for coping in stressful situations include escape-avoidance and seeking social support. These strategies can serve either emotion-focused or problem-focused functions. Escape-avoidance describes wishful thinking and behavioral efforts to escape or avoid the problem. For example, an individual may wish that the situation would go away or somehow end. Seeking social support describes efforts to seek informational support, tangible support, or emotional support. For instance, a person may talk to someone to find out more about the situation.

In summary, the stress-and-coping model takes into account both the person and the environment during a stressful situation. The person's cognitive appraisal of the situation is partially responsible for the choice of coping strategy. Stressful encounters appraised as controllable are more often coped with by using problem-focused strategies whereas encounters appraised as uncontrollable are more often coped with by utilizing emotion-focused strategies. The choice of coping strategy also varies with respect to the context of the stressful encounter. Coping strategies also appear to be variable across situations, although patterns of coping evolve if measured over time and across situations. Finally, coping is viewed as a mediator of emotion. Coping is created in the encounter, and it changes the relationship between the antecedent and the outcome variable (Folkman & Lazarus, 1988).

Coping Measurement

Coping measurements are directly related to their conceptualizations. The two approaches to coping described thus far (style and process) ask and answer different questions. Conceptualization of coping as a style emphasizes personality dispositions that are believed to transcend context and cognitive factors with regard to the choice of coping strategy. The measurements associated with this conceptualization usually reveal dichotomous or unidimensional variables that explain how an individual usually copes. However, the evaluation of coping styles does not appear to adequately explain or predict how people cope with the many forms of stressful encounters.

On the other hand, the operationalization of coping as a process takes both cognitive and contextual factors into account when evaluating the chosen coping strategies. Measurement is directed toward what an individual actually thinks and does within the context of a specific encounter. One such measure is the revised Ways of Coping Questionnaire (WOCQ) (Folkman & Lazarus, 1988). It is one of the most widely used instruments in current coping research (Smith & Wallston, 1992).

The WOCQ was developed to provide researchers with a theoretically derived measure that could be used to explore the role of coping in the relationship between stress and adaptational outcomes. It is designed to identify the thoughts and actions an individual has used to cope with a specific stressful situation. In addition, Folkman and Lazarus assert that their process oriented instrument can also reveal individuals' coping patterns. In order to assess coping patterns with this instrument, the investigator would need to measure an individual's coping processes across different stressful situations. This would determine to what degree individuals consistently employ specific coping strategies.

Coping and Psychological Adjustment

The primary importance of appraisal and coping processes is that they affect adaptational outcomes. It was the goal of the present study to determine how appraisal and coping in PPS individuals were related to their psychological well-being. Although psychological adaptation has a multidimensional quality, it can be conceptualized as a fairly stable indicator that summarizes one's abilities and limitations in a particular time frame. Most definitions also refer to affect or emotion. It can be measured by specific variables such as depressive symptoms, life satisfaction, and psychosocial impairment.

With regard to coping and emotions, Folkman and Lazarus (1988) found that some forms of coping were associated with increases in positive emotions and other forms associated with increases in negative emotions. They found that planful problem solving was associated with less negative and more positive emotions. The results also indicated that distancing was related to a worsened emotional state.

It is presumed that coping processes should be at least moderately stable across diverse stressful situations in order to affect adaptational outcomes. Folkman et al. (1986) found that three problem-focused coping strategies were fairly unstable and subject to influence by the situational context. Conversely, an emotion-focused coping strategy, was the most stable, which suggests that it may be more heavily influenced by person factors than by other coping strategies. Despite only moderate stability in coping strategies, the results showed that planful problem solving was negatively correlated with psychological symptoms (e.g., better adaptation). On the other hand, confrontive coping was associated with unsatisfactory outcomes. These results suggested that planful problem solving was the more adaptive form of coping.

In summary, the purpose of the present study was to investigate cognitive appraisal and coping in persons with PPS and how these factors relate to psychological adaptation. This study evaluated the cognitive appraisal stage of coping by measuring the degree of subjective controllability in each of several stressful encounters as perceived by individuals with PPS. Also, it was of interest to focus on two different contexts in which these individuals must cope. One such context was stressful situations directly related to the disabling condition (PPS-related). The other will be focused on stressful encounters unrelated to PPS (non-PPS-related). It is possible that PPS persons have developed distinct strategies for coping with their disability that differs from coping with stressors unrelated to PPS

CHAPTER III

STATEMENT OF THE PROBLEM

The emergence of post-polio sequelae (PPS) is a source of stress for individuals who contracted poliomyelitis decades ago. After the initial attack of the polio virus, most individuals spent several years in aggressive physical rehabilitation treatments. After reaching their peak recovery, a large proportion of these people assimilated into mainstream society without obvious physical indicators of their previous illness. The psychological impact of the initial illness is primarily speculative. However, current research indicates that many individuals who have developed PPS are not adapting well, psychologically, with their second disability.

Possible reasons for their psychological distress is varied. One source of distress could be a result of PPS individuals and their physicians not being aware of the potential problems developing in later life. Another source of distress could be that PPS has an insidious and progressive onset with an unknown etiology. In addition, distress may result from the fact that treatment for PPS merely serves to manage the symptoms and to slow the progressive deterioration; there is no known cure. Finally, PPS individuals must now cope with distressing pain, fatigue, weakness, muscular atrophy, disfigurement, weight gain, loss of function, and significant work disability. Bruno and Frick (1991) have argued that PPS individuals developed Type A and compulsive behavior patterns after the initial bout of poliomyelitis. Post-polio individuals have been characterized as overachievers, goal-oriented, and controlling. Since individuals with PPS can no longer function at their desired intensity, they have been forced to make major life-style changes. These changes include conserving energy by utilizing assistive technology devices, taking periodic rests, delegating tasks, and using helpers with certain daily living efforts. Apparently, these changes are distressing for these individuals. The implication is that they can no longer cope with stressful situations in the same manner. These ideas, however, have not been empirically tested.

It is not surprising, then, that a significant number of individuals with PPS have had difficulties with psychological adaptation, showing symptoms such as depression and feelings of hostility, anger, fear, frustration, and isolation. Since there is no cure for PPS and the medical treatments are limited, it is important to identify factors that may have a relationship to these individuals' psychological well-being.

It is likely that numerous factors contribute to long-term psychological adaptation. Thus, it is essential to adhere to an empirically based theory to direct an investigation. In this study, the chosen framework was the stress-and-coping theory of Lazarus and Folkman (1984). This theory has gained considerable support in several research areas. Regarding coping efforts associated with disability, findings indicate that emotion-focused coping is related to increased psychological distress in mothers of disabled children, whereas problem-focused coping is associated with decreased distress (Miller, Gordon, Danielle, & Diller, 1992). Therefore, the theory is likely to be applicable to individuals with PPS.

Current theory and research on the relationship between stress and psychological adaptation indicates that this relationship is mediated by coping processes. It was the contention of this study that the way in which PPS persons cope with stressors in their daily lives will be related to their psychological well-being. Given an understanding of how this population copes with stress, it is possible to create intervention strategies which can assist those who are coping relatively poorly.

Despite the variability of coping efforts across situations, it was proposed that, if habitually employed, some coping patterns are more likely adaptive whereas others are potentially maladaptive. This is consistent with findings which suggest that planful problem solving is a more adaptive form of coping than is confrontive coping. It should be noted, however, that it is important not to overestimate the value of one particular coping pattern without reference to the context in which it is used. For instance, confrontive coping appears to be the more adaptive form of coping among cancer and tuberculosis patients (Folkman, et al., 1986). Thus, it is of interest in this study to investigate the stressors encountered by persons with PPS in two different contexts: 1) those situations that are directly associated with PPS (PPS related) and 2) those situations not related to PPS (non-PPS-related).

According to the stress-and-coping theory, the chosen coping strategies are determined by the stressful encounter. In addition, Lazarus and Folkman (1984) have suggested that functional and dysfunctional coping may depend on the goodness of fit between 1) the person's appraisal of what is happening and what is actually happening (reality testing) and 2) the person's appraisal of the options for coping and his or her actual coping activity. For instance, if a person appraises a situation as controllable when in reality it is uncontrollable, his or her coping efforts are likely to produce a poor outcome. Conversely, if people appraise a situation accurately, but do not utilize the appropriate coping strategies, they will have an adverse outcome as well.

A significant portion of individuals with PPS have been found to exhibit Type A as well as compulsive behavior patterns (Bruno & Frick, 1991). These individuals seem to have a strong need to be in control. Thus, it is likely that PPS individuals appraise both PPS related and non-PPS related stressful situations as controllable. In reality, this cannot be so. Therefore, it is hypothesized that poorly adapted persons with PPS who inaccurately appraise PPS and non-PPS stressful situations will consistently utilize inappropriate coping strategies.

It is also possible that persons with PPS will appraise both types of stressful situations accurately. However, it is hypothesized that they will consistently utilize problem-focused strategies regardless of the appraisal. This hypothesis is based on a study of the relationship between coping and Type A behavior patterns (Kirmeyer & Diamond, 1985). It was found that Type A individuals did not vary their use of problem-focused coping according to whether the event was appraised as controllable or uncontrollable. In events appraised as uncontrollable, Type A individuals used relatively more problem-focused coping. Therefore, if individuals with PPS consistently utilize inappropriate coping strategies, they will likely have poorer psychological adaptation than their counterparts.

Another hypothesis in this study is that individuals with PPS who accurately appraise PPS related and non-PPS related situations and who consistently utilized the most appropriate coping strategies will, in turn, manifest better psychological adaptation.

Support for this hypothesis is shown in a study of stress and coping processes in college students (Forsythe & Compas, 1987). They found that the use of relatively more problem-focused than emotion-focused coping for events that were appraised as controllable was associated with an adaptive outcome. Findings also indicated that the use of relatively more emotion-focused than problem-focused coping was associated with an adaptive outcome for events that were appraised as uncontrollable.

A significant number of individuals with PPS exhibit psychological distress. The factors associated with this distress in unknown. Thus, the purpose of this study is to investigate how coping with stressful situations is associated with psychological adaptation. Two different contexts will be evaluated; PPS related and non-PPS related. Also, the subjective cognitive appraisal of each stressful encounter will be evaluated in order to uncover its relationship to coping and psychological adaptation. It is hoped that a better understanding of how PPS individuals cope with daily stressors will aid in the creation of treatment interventions.

CHAPTER IV

METHOD

Subjects

One hundred and seven individuals were recruited from both a post-polio support group in the metro-area of Oklahoma City, Oklahoma and an Internet post-polio newsgroup. Packets containing all measures were sent via the postal service to these participants. Forty-seven of the 107 packets were returned and utilized for analysis. The sample was comprised of 19 males and 28 females with a mean age of 54 (SD = 9.8). Fifty-three percent of the sample reported attending PPS support groups, and 45 percent of the sample were recruited from the Internet. Participants were asked to report the age they were diagnosed with PPS. The average participant was diagnosed with PPS for 5.5 yeas (SD = 5.5). Phone interviews with 20 individuals who did not complete or return the packer revealed no significant differences with regard to demographics or disease severity. Reasons for attenuation fell into three main categories: (1) the participant became too busy; (2) participation in the study was more time consuming than anticipated; and (3) the participant was too fatigued by the end of the day to fill out forms. Therefore, this sample is believed to be representative of the population of PPS individuals.

Measures

Demographic Data

General information was gathered regarding the participants' age, gender, etc. They also indicated their age of onset of the initial bout of poliomyelitis as well as the age at which they were diagnosed with PPS.

Disease Severity

The two components of the Modified Stanford Health Assessment Questionnaire (the MHAQ-D and the MHAQ-P) (Pincus et al., 1983) were utilized to measure the current degree of difficulty and pain experienced by the participants while performing daily activities. The level of difficulty in performing daily activities was measured by the MHAQ-D. It is comprised of eight questions on a 4-point scale and ranges from "without any difficulty" (1) to "unable to do" (4) which, for example, asked participants if they were able to "get in and out of bed" and "wash and dry their entire body." The level of pain associated with performing the same eight activities was measured by the MHAQ-P. It is also on a 4-point scale, ranging from "never" (1) to "always" (4). Scores on these measures were calculated by summing the items (range = 8-32). Previous investigations (Frieso et al., 1980, Nicasso et al., 1985) have indicated that reliability and validity of the modified MHAQ is comparable to the orignial 20-item version of the measure.

Stress and Coping Process

Three measures were used to assess stress and coping processes in this study: (1) Stressor Frequency and Severity, (b) Cognitive Appraisal, and (c) the revised Ways of Coping Questionnaire (WOCQ).

Stressor Frequency and Severity. Participants documented daily stressful events for two weeks. Average PPS and non-PPS-related frequency scores were calculated by adding the number of reported events and dividing by 14 days. They also rated the severity of each documented stressful event on a 10-point scale ranging from "not very stressful" (1) to "very stressful" (10). Average PPS and non-PPS-related severity scores were calculated by adding the ratings and dividing by the frequency of reported events.

Cognitive Appraisal. At the end of both week 1 and week 2 participants indicated on a 5-point scale the extent to which the most stressful PPS and non-PPS event were controllable (1) (something they could change or do something about) or uncontrollable (5) (something they had to accept). Average PPS and non-PPS controllability scores were calculated for the two-week period.

Strategies. The revised Ways of Coping Questionnaire (WOCQ) (Folkman & Lazarus, 1988) measures a broad range of cognitive and behavioral strategies that people use to manage internal and/or external demands in a stressful situation. The WOCQ is comprised of 66 items to which an individual indicates on a 4-point Likert scale, the extent to which they used each strategy described by the item during the stressful encounter (e.g., "I tried to keep my feelings to myself," "Talked to someone to find out more about the situation," "Criticized or lectured myself," "Hoped a miracle would happen"). Previous factor analysis on the WOCQ provides a basis for summing subsets of items in order to create the following eight categories: (1) Confrontive Coping, (2) Distancing, (3) Self-Control; (4) Seeking Social Support, (5) Accepting Responsibility, (6) Escape-Avoidance, (7) Planful Problem-solving, and (8) Reappraisal. These eight categories can then be grouped into two global measures known as problem-focused and emotion-focused ways of coping. The categories which comprise problem-focused coping are Confrontive Coping and Planful Problem-Solving. The categories which comprise emotion-focused coping are Distancing, Self-Control, Seeking Social Support, Accepting Responsibility, Escape-Avoidance, and Positive Reappraisal (Folkman & Lazarus, 1988). A relative percent score for problem-focused and emotion-focused coping was calculated in order to control for the unequal numbers of items within the two global measures and for individual differences in response sets (Vitaliano, Maiuro, Russo & Becker, 1987).

Participants completed the WOCQ four times over the two-week period, once for each of the sampled stressful events (two stressful PPS-related events and two stressful non-PPS-related events). They were asked to think about the most stressful event they encountered during the past week, who was involved, what happened, and what made the situation stressful. With the specific stressful encounter in mind, individuals then responded to items on the WOCQ which assesses how the individual coped with that particular event.

Psychological Adaptation as the Primary Outcome Measure

The Brief Symptom Inventory (BSI) was used to evaluate psychological adaptation in this study. The BSI is a 53-item self-report measure designed to assess the psychological well-being of psychiatric, medical, and normal individuals (Derogatis, 1988). It is designed to provide a multi-dimensional symptom measurement in approximately 10 minutes completion time. Each of the 53 items are on a 5-point scale of distress ranging from "not at all" (0) to "extremely" (4). Participants are asked to consider "the past seven days including today" when rendering their self-observing assessment on an easy-to-comprehend answer sheet. Typical questions include, "How much were you distressed by: Poor appetite? Feeling uneasy in crowds? Your mind going blank?"

Four of the nine symptom dimensions were of interest in this study: (1) Somatization (SOM), which reflects distress arising from perceptions of bodily dysfunction (7 items); (2) Depression (DEP), which reflects a representative range of the indices of clinical depression (6 items); (3) Anxiety (ANX), which includes signs such as nervousness, tension, and feelings of apprehension (6 items); and (4) Hostility (HOS), which includes thoughts, feelings, or actions that are characteristics of the negative affect state of anger (5 items) and were the only measures used in the analysis. Area T-scores were calculated for each symptom dimension. Subscales not used in the study were: Obsessive-Compulsive, Interpersonal Sensitivity, Phobic Anxiety, Paranoid Ideation, Psychoticism, Global Severity Index, Positive Symptom Total, and Positive Symptom Distress Index.

Procedure

Participants were recruited in person or by telephone from a PPS support group list, and by posting a request on an Internet PPS Newsgroup. Consenting participants were sent the necessary questionnaires and instructions regarding the study via the postal service.

Each participant was asked to keep a daily list of PPS-related and non-PPS-related stressful events for two weeks. On a form provided, they wrote a brief one-to-two sentence account for each stressful event which occurred that day. They were also asked to give each stressful event a severity rating of 1 (not very stressful) to 10 (extremely stressful). The purpose of the daily listing of stressful events was to facilitate the recall of both types of stressful events and their severity levels. At the end of each of the two weeks, the participant identified one most stressful PPS-related event and one most stressful non-PPS-related event from the previous week. The individual then completed the WOCQ for only those events. The participants were then asked to rate the controllability of those encounters using the cognitive appraisal questions.

In order to temporally distribute the task of completing several questionnaires, the demographic information and the MHAQ-D/P were completed during the first two weeks of the data collection. The BSI was completed during the final week of the evaluation period. Upon completion of the two week evaluation, the participants returned the data via the postal service in pre-paid envelopes

CHAPTER V

RESULTS

Relationships Among Independent Variables

Descriptive statistics for all PPS-related and non-PPS-related measures are presented in Table 1. The correlation matrix of primary variables can be found in Table 2.

Disease Severity Measures

Means and standard deviations of the three disease severity measures of PPS were: (1) number of body parts affected by PPS ($\underline{M}$=9.17; $\underline{SD}$=5.85; range=2-20), (2) the Modified Stanford Health Assessment Questionnaire-Difficulty (MHAQ-D) ($\underline{M}$=13.87; $\underline{SD}$=3.93; range=8-25), and (3) the Health Assessment Questionnaire-Pain (MHAQ-P) ($\underline{M}$=14.67; $\underline{SD}$=.01, range=8-27).

These three measures were moderately related to each other, all in a positive direction ($\underline{r}$=.49 to .80, $\underline{p}$<.05). Regarding gender, females tended to score higher on pain associated with daily activities (MHAQ-P). Also, the longer individuals had been diagnosed with PPS, the more difficulty they reported with daily activities (MHAQ-D) (See Table 2).

Table 1

Descriptive Statistics of PPS and Non-PPS-Related Stressful Events

	PPS	non-PPS
Frequency[a]		
M	1.45	1.35
SD	.77	.79
Severity[b]		
M	4.15*	3.64
SD	1.98	1.70
Controllability[C]		
M	3.72	3.38
SD	1.08	1.17
Problem-Focused Coping[d]		
M	53.47*	59.67
SD	11.60	9.43

Note. Asterisks indicate significant PPS/non-PPS difference at $p < .05$.
[a]Frequency range = 0-5. [b]Severity range = 1-10. [c]Controllability range = 1-5.
[d]Problem-Focused Coping range = 0-100.

Table 2

Correlations Among Predictor Variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Gender	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2. Duration of PPS	-.004	-	-	-	-	-	-	-	-	-	-	-	-	-
3. Internet	.22	-.14	-	-	-	-	-	-	-	-	-	-	-	-
4. MHAQ-P	-.52**	.49***	-.17	-	-	-	-	-	-	-	-	-	-	-
5. MHAQ-D	.35*	.80***	-.17	.57***	-	-	-	-	-	-	-	-	-	-
6. Current Involvement	-.23	.27*	-.09	.49***	.80***	-	-	-	-	-	-	-	-	-
7. PPS Frequency	.08	.02	.04	.25*	.02	.13	-	-	-	-	-	-	-	-
8. Non-PPS Frequency	.09	-.12	-.10	.05	-.14	.06	.56***	-	-	-	-	-	-	-
9. PPS Severity	-.003	.06	-.15	.20	.17	.23	.47***	.19	-	-	-	-	-	-
10. Non-PPS Severity	.12	-.11	-.14	.02	-.05	.08	.50***	.56***	.72***	-	-	-	-	-
11. PPS Controllability	.11	-.02	.16	.03	.12	.17	.12	-.15	.21	.23	-	-	-	-
12. Non-PPS Controllability	.29*	-.02	.11	-.04	-.04	-.06	.02	.05	-.01	-.03	.26*	-	-	-
13. PPS Problem-Focused Coping	-.06	-.14	-.02	.19	.03	.21	.03	.20	-.01	.12	-.39***	-.09	-	-
14. Non-PPS Problem-Focused Coping	.08	-.39**	.02	-.003	-.10	.18	-.02	.32*	-.20	.09	.02	.08	.34*	-

Note. Gender measure males=1, females=0. Duration of PPS indicates the number of years participants have been diagnosed with PPS. Internet represents whether participants were recruited from a post-polio news group (yes=1, no=0). MHAQ-P/D range= 8-27. Current involvement indicates the number of body parts affected by PPS. PPS/non-PPS frequency indicates the average number of stressful events reported. PPS/non-PPS severity indicates the average level of perceived distress of reported events (range=1-10). PPS/non-PPS controllability indicates the degree of perceived controllability regarding the four most stressful events chosen (range=1-5). PPS/non-PPS problem-focused coping represents relative percent problem-focused scores across the two weeks (range=0-100).
*$p < .05$, **$p < .01$, ***$p < .001$.

Frequency and Severity Ratings of PPS and Non-PPS Stressful Events

Average frequencies and average severity ratings of PPS and non-PPS-related stressful events were calculated for the two week period. Two-tailed paired t-tests were conducted to examine differences in average frequency and severity ratings between these events. The average frequency of PPS and non-PPS-related events did not differ significantly over the two weeks; however, the average severity rating of the events was higher for PPS-related events (See Table 1).

All frequencies and severity ratings of PPS and non-PPS-related events were positively related to each other, with the one exception of non-PPS frequencies and PPS severity ratings which had a trend in a positive direction (See Table 2).

Controllability of PPS and Non-PPS Stressful Events

Average controllability scores for PPS and non-PPS-related events were calculated across the two weeks. Two-tailed paired t-tests were conducted to examine differences in controllability between these events. No significant difference in perceived controllability was found between PPS and non-PPS-related stressful events (See Table 1).

Controllability scores for these events were related to each other in a positive direction. Of interest, PPS-related controllability scores were negatively related to PPS problem-focused coping (See Table 2).

Coping with PPS and Non-PPS Stressful Events

Relative percent problem-focused scores were calculated for PPS and non-PPS-related events across the two weeks. Since problem-focused and emotion-focused coping are percent scores that sum to 100 percent, more of one always means less of the other, only problem-focused coping was calculated and used in the analysis. Two-tailed paired t-tests were performed to examine coping differences between PPS and non-PPS-related stressful events. Over the two-week period, participants utilized relatively more problem-focused and less emotion-focused coping strategies for non-PPS-related events than they utilized for PPS-related events (See Table 1).

PPS problem-focused coping was positively related to non-PPS coping. Interestingly, non-PPS problem-focused coping of events was positively related to frequency, but not related to the severity of the stressors. Also, PPS coping was not related to either frequency or severity of PPS stressful events (See Table 2).

Prediction of Psychological Adaptation

Outcome Measures

Four symptom dimensions of the Brief Symptom Inventory (BSI) (Somatization (SOM), Depression (DEP), Anxiety (ANX), and Hostility (HOS) were used as outcome measures of psychological adaptation. These were chosen because the BSI was not specifically normed with a physically disabled population, and it was possible that PPS individuals would score inordinately higher on the SOM scale given their objective physical condition and would not necessarily reflect the psychological component of somatization. This could have biased a summary measure of psychological adaptation. In fact, preliminary t-test analyses showed that SOM was significantly different than the DEP, ANX, and HOS symptom dimensions, where as, the means of DEP, ANX and HOS did not differ significantly from each other. Descriptive statistics for outcome measures are shown in Table 3.

An examination of all possible predictor measures with outcome measures was completed to determine inclusion or exclusion from further analyses. The correlation matrix for independent variables with outcome measures can be found in Table 4.

Demographics and Outcome Measure

Two-tailed t-tests were performed to examine group differences of gender and Internet/non-Internet recruitment on the SOM, DEP, ANX, and HOS dimensions. No gender or recruitment differences were found among the four symptom dimensions (See Table 3).

Gender was positively related to the DEP, ANX, and HOS dimensions and was used in the prediction of all outcome measures. Internet/Non-Internet recruitment and the duration participants had been diagnosed with PPS were not related to any outcome measures, and were eliminated from further analysis (See Table 4).

Disease Severity and Outcomes Measures

The number of body parts affected by PPS, the MHAQ-D and the MHAQ-P were all positively related to the SOM dimension, and were used in the prediction of all outcome measures (See Table 4).

Table 3

Descriptive Statistics for Outcome Measures

	M	SD
Somatization (SOM)	63.34_a	9.39
Depression (DEP)	57.77_b	10.45
Anxiety (ANX)	58.57_b	11.03
Hostility (HOS)	57.21_b	8.21

Note. Means with different subscripts represent a significant difference at $p < .05$.

Table 4

Correlations of Predictor Variables with Outcomes Measures

	Somatization	Depression	Anxiety	Hostility
Gender	-.007	.30*	.27*	.29*
Duration of PPS	.19	-.039	-.17	-.04
Internet	-.18	.10	-.02	-.30
MHAQ-P	.44**	-.04	.12	-.13
MHAQ-D	.45**	-.24	-.06	-.12
Current Involvement	.25*	-.15	-.007	-.07
PPS Frequency	.26*	.29*	.23	.07
Non-PPS Frequency	-.15	.07	.22	.17
PPS Severity	.36**	.38**	.31*	.26*
Non-PPS Severity	.17	.27*	.36**	.31*
PPS Controllability	.08	.06	.16	-.01
Non-PPS Controllability	-.09	.05	.10	-.12
PPS Problem-Focused Coping	-.12	-.17	.10	.08
Non-PPS Problem Focused Coping	-.19	-.40**	.04	.03

Note. For descriptions of measures see Table 2 note.
*$p < .05$, ** $p < .01$.

Frequency and Severity Ratings of PPS and Non-PPS Stressful Events and Outcome Measures

The frequency of non-PPS-related events was not related to the outcome measures; however, the frequency of PPS-related events was positively related to both SOM and DEP. Severity ratings of both PPS and non-PPS events were related to DEP, ANX, and HOS, all in a positive direction. Previous analysis showed that the mean frequency of PPS and non-PPS events did not differ, and that the frequencies were eliminated from further analysis, and severity ratings were used in the prediction of the outcome measures.

Controllability of PPS and Non-PPS Stressful Events and Outcome Measures

Neither PPS nor non-PPS perceived controllability scores were related to any of the outcome measures. Although previous analyses also found no mean differences, they were nevertheless used in the prediction of psychological adaptation based on theoretical reasons. Folkman and Lazarus (1988) contend that perceived controllability of stressful events will have an impact on the coping process, and ultimately on psychological adaptation.

PPS and Non-PPS Coping Strategies and Outcome Measures

Problem-focused coping with non-PPS-related events was negatively related to DEP. This meant that lower DEP scores were related to the utilization of more problem-focused coping strategies. Problem-focused coping with non-PPS-related events was not related to any outcome variables. Both PPS and non-PPS problem-focused coping were used in the prediction of the outcome measures.

Multiple Regression Analysis

To examine individual variables as predictors of psychological adaptation, four regression analyses were conducted with SOM, DEP, ANX, and HOS serving as the outcomes measures. Gender, three PPS severity measures (number of body parts affected by PPS, MHAQ-P, and MHAQ-D), and three average PPS/non-PPS measures (controllability, severity rating, and problem-focused coping) served as predictor variables.

Stepwise regression analyses were used for all equations as there was no preset order in which the predictor variables were allowed to enter the regression equation. This method was used because the interest of this study was primarily descriptive and exploratory (Hays, 1988). Results of the four regression analyses were presented in Tables 5-8.

For the psychological adaptation measure of Somatization (SOM), the four predictors, all in a positive direction, were the MHAQ-D, the MHAQ-P, the average severity ratings of PPS stressful events, and the number of body parts affected by PPS.

Table 5

Summary of Stepwise Regression of Psychological Adaptation Outcome Measure: Somatization (SOM)

Predictor	Beta	p
MHAQ-D	.641	.005
MHAQ-P	.287	.056
Current Involvement	-.479	.029
PPS Stressor Severity Rating	.304	.022

Equation $R^2 = .41$, $F\ (4, 39) = 6.7$, $p < .001$.

Table 6

Summary of Stepwise Regression of Psychological Adaptation Outcome Measure: Depression (DEP)

Predictor	Beta	p
Gender	.296	.027
Non-PPS Stressor Severity Rating	.277	.039
Non-PPS Problem-Focused Coping	-.451	.001

Equation $R^2 = .34$, $F\ (3,40) = 7.0$, $p < .001$.

Table 7

Summary of Stepwise Regression of Psychological Adaptation Outcome Measure: Anxiety (ANX)

Predictor	Beta	p
Non-PPS Stressor Severity Rating	.356	.018

Equation $R^2 = .356$, F (1, 42), $p < .05$.

Table 8

Summary of Stepwise Regression of Psychological Adaptation Outcome Measure: Hostility (HOS)

Predictor	Beta	p
Non-PPS Stressor Severity Rating	.309	.041

Equation $R^2 = .309$, $F(1, 32) = 4.43$, $p < .05$.

This indicated that the more pain and difficulty they experienced, and the more body parts affected by PPS and severity of PPS stressful events reported, the higher their SOM scores were.

For the psychological adaptation measure of Depression (DEP), two measures, gender and non-PPS severity ratings of stressful events, were significant predictors in a positive direction, and problem-focused coping for non-PPS events was a significant predictor in a negative direction. Higher DEP scores were characteristic of males, higher non-PPS severity ratings, and relatively more emotion-focused coping of non-PPS-related events.

For the psychological adaptation measures of Anxiety (ANX) and Hostility (HOS), average non-PPS severity rating was the single predictor in a positive direction. This indicated that the higher the severity scores of non-PPS events, the higher their scores were on the ANX and HOS measure.

CHAPTER VI

DISCUSSION

For this study, psychological adaptation in individuals with PPS was predicted to be related to the coping process of stressful events. The important components of the coping process included perceived controllability and the coping strategies utilized for stressful events within two different contexts (PPS and non-PPS-related). While several individual variables were related to psychological adaptation symptom domains, in most cases, the perception of stressful event severity was a more consistent predictor than the hypothesized controllability and coping efforts employed. Also, for the most part, the four symptom domains (somatization, depression, anxiety, and hostility) were related to different sets of independent variables. The general findings pointed to a need for health service providers to focus their attention on the degree of stress in the lives of PPS persons, and how this is related to their psychological adaptation.

Testing the Hypotheses

According to the Folkman and Lazarus model of coping (1987), adaptive or non-adaptive coping may depend on the correct combination of controllability, appraisal and coping strategy used in a stressful situation. Also, the judgement of whether a combination was adaptive may depend on the context of the stressor. It was hypothesized that PPS individuals who inaccurately appraised the controllability of PPS and non-PPS-related stressful events and utilized inappropriate coping strategies would exhibit poor psychological adaptation. Conversely, if they accurately appraised the controllability of these stressful events and utilized appropriate strategies, they would manifest favorable psychological adaptation.

Because participants were not asked to indicate which specific stressful PPS or non-PPS-related events they selected for the completion of the coping measure, it was not possible to evaluate the accuracy of their controllability appraisal of the these events. Results, however, clearly showed that the controllability factor did not interact with the coping strategy utilized in either PPS or non-PPS-related stressful events to predict psychological adaptation. Though participants appraised both PPS and non-PPS stressful events as approximately equal in controllability, there was a trend toward events being controllable. This is consistent with the tendency for PPS individuals to exhibit compulsive behavior patterns and high needs for control (Bruno & Frick, 1991).

Another hypothesis was that participants would consistently utilize problem-focused strategies, apply these strategies in both controllable and uncontrollable situations, and would, therefore, manifest poor psychological adaptation when there was a "mismatch" between appraisal and coping strategy used. This was not supported in that controllability, again, did not interact with the coping strategies used to predict psychological adaptation.

The lack of support in these findings is in contrast to the theoretical model where controllability is an important component of the coping process (Lazarus, 1993; Lazarus & Folkman, 1987). One reason for the lack of support may be that the measure of controllability was not sufficiently sensitive to capture this construct. However, the method used for the measurement controllability in this study has been successfully used in other studies (Folkman & Lazarus, 1980; Folkman et al., 1986). Another possibility may be that the stress-and-coping model proposed is not applicable to the PPS population. Supporting evidence was found by Mishel and Sorenson (1993) who concluded that coping strategies which produce more favorable outcomes are likely different for medical populations than for non-medical populations.

There was substantial redundancy between PPS and non-PPS stressors reported by participants. The absence of controllability variation between these stressors may be related to the types of events reported. For example, they listed interpersonal conflict, financial stress, work stress, marital discord, shopping difficulties, house guests, traveling, driving, weather, time pressures, and dietary problems as both PPS and non-PPS-related stress. Though there were several stressors unique to PPS-related events, individuals appeared to have difficulty creating distinctive PPS and non-PPS-related categories, thus may have rated them both as equally controllable. Therefore it is also possible that they selected PPS and non-PPS-related events that were similar to each other for the completion of the coping measure which, in turn, reduced the difference in perceived controllability.

Interestingly, though PPS individuals did not report more PPS-related stressful events than non-PPS events, they did report them as more severe. PPS individuals not only listed problems with physical limitations such as, fatigue, pain, and poor sleep, but also reported functional problems including, fears of falling, problematic assistive technology (e.g., braces, wheelchairs), and difficulty accessing public and private facilities.

These physical and functional problems were unique to PPS-related stressors and were not found with reported non-PPS stressors. Findings here are consistent with Grimby and Jonsson (1994) who found that the main impact of disability for PPS persons is in mobility-related activities, and secondarily for activities of daily living (e.g., cooking, transportation, cleaning, shopping). The difference in perceived stress between PPS and non-PPS-related events may be related to the unexpected and unwanted progression of the disease process.

Further Examination of Symptom Domains

Although the predicted outcomes of this study were not supported, other individual variables were examined for their contribution to psychological adaptation. Each symptom domain will be discussed separately.

Somatization

The prediction of this symptom domain focused on both physical symptoms and on the perceived severity of PPS-related events encountered. This is not surprising given that this symptom domain reflects distress arising from perceptions of bodily dysfunction. It also makes sense that the perceived difficulty of the PPS-related stressors and actual physical limitations would contribute to the increase in their somatic focus. An important implication here is that this symptom domain reflects more objective physical problems than subjective psychological distress, and that for this population somatization needs to be examined separately from other psychological aspects of distress.

Depression

Several individual variables predicted depressive symptoms such as dysphoric mood and affect, lack of motivation, and loss of interest in life. It was found that these symptoms were associated with both the perception of the severity of non-PPS-related events and the utilization of relatively more emotion-focused coping strategies for these events. Because these two factors are related to non-PPS-related stressors, it may be that PPS individuals are employing ineffective strategies for events that would seemingly predate PPS stressors. In addition, they may have a distorted perception of their daily hassles which contribute to depressive symptoms. It is possible that employing problem-focused strategies (i.e., confrontive coping and planful problem solving) for these familiar daily life stressors would increase their feelings of self-efficacy and positive affect. This supposition is supported by results of the Felton and Revenson (1984) study wherein problem-focused coping had a positive effect on adjustment over time in adults with chronic illnesses. In addition, they may have a distorted perception of their daily hassles which contribute to depressive symptoms. Their perception of stress may be amplified due to the increased difficulty of tasks which used to be easily accomplished.

In contrast to most studies on gender and depression, it was found that males were more likely to exhibit depressive symptoms. Nolen-Hoeksema (1987) suggests that men may respond to their dysphoria more behaviorally and dampen their depressive episodes. In the population of PPS, men who are now experiencing physical limitations may not be able to engage in typical response sets which would temper depressive moods. In fact, further examination of the stressful events reported by men indicated that they often reported not being able to perform tasks that they felt they "should" be doing. Thus, they may be limited to more ruminative responses that amplify their depressive state.

Anxiety

This symptom domain reflected feelings of nervousness, tension, panic, and apprehension, and was best predicted by the perceived severity of non-PPS-related stressful events. An examination of the non-PPS-related events indicated that they comprised common stressors most people encounter in their daily lives (e.g., interpersonal conflict, financial stress, work stress, time pressures, marital discord, shopping difficulties, traveling, having guests, weather, car trouble, non-PPS health problems, and weight loss).

It is speculated that the pain, fatigue, and physical limitations of PPS may make the perception of everyday stress worse, and may contribute to anxious feelings. For example, because they now have to conserve energy and take more time to complete tasks, they may feel subjective pressure and tension at work, or even at home with completing tasks they used to do quickly. This is supported by Bruno and Frick (1991) who contend that PPS individuals have a learned work ethic wherein they have high expectations of themselves and have difficulty delegating tasks. Thus, when PPS persons cannot do daily tasks as efficiently or effectively as they used to, they manifest symptoms of anxiety. In addition, bad weather and car trouble seem to be related to limitations of PPS in that these individuals appeared apprehensive about venturing out because of fears of getting stranded if in an accident or having car trouble.

Hostility

Hammond (1991) and Bruno and Frick (1987) report a tendency for PPS individuals to exhibit Type-A personality characteristics. One of the primary components of the Type-A personality is hostility which was conceptualized here as thoughts, feelings, or actions that are characteristic of the negative affect state of anger. Here, again, perceived stress severity of daily life, non-PPS-related events was the best predictor of hostile characteristics. As part of the diagnosis of PPS, these individuals had many years where they had few, if any residual effects of the original bout of PPS. Now that they are experiencing new, unexpected physical difficulties, they may perceive daily, non-PPS events as more stressful than they used to, which may result in both internal and overt expressions of anger.

Limitations of this Study

Several measurement and methodological issues of this study may have had an impact on the overall findings. Regarding measurement, a more precise instrument of controllability for the reported stressors could be developed which may show a clearer picture of the interaction between appraisal and coping strategies used. Also, there appears to be the need for a better understanding of the PPS-related and non-PPS-related stressful event categories. The common stressful events listed for these categories indicated either a lack of ability to separate the two, or a lack of understanding of the instructions given.

Methodologically, it would have been helpful if they indicated which "most stressful" PPS and non-PPS events for the week were chosen when responding to the coping strategy measure. This would have given the opportunity to make a judgement of their "accuracy" regarding the level of controllability in addition to information about the content of the stressful event. Also, it would have been beneficial to have had the participants rate the controllability of each stressor reported over the two weeks, giving a better indicator of the variability, or not, of the PPS and non-PPS-related stressors. In retrospect, these important pieces of information would have more precisely elucidated the relationship, if any, among stressor context, controllability, and coping strategies used.

PPS participants may also have been overwhelmed or confused regarding the packet and instructions sent in the mail. It may have been helpful to make an initial contact by telephone in order to clarify questions or concerns. Then, two weekly calls could have been made to help individuals choose the most clearly defined and stressful PPS and non-PPS-related event. Telephone contacts may have also increased the number of participants who actually completed and returned the materials.

Summary and Future Research

The stress-and-coping model tested in this study of PPS individuals was not supported. While it is possible that measurement and methodological problems thwarted the confirmation of the theory, careful examination of the data indicated that PPS likely pervades the lives of these individuals making the artificial separation between PPS and non-PPS-related events into distinct categories conceptually difficult. In fact, more than one participant spontaneously indicated that it was difficult to separate stressful events because PPS makes non-PPS events more stressful. This artificial separation of stressors may not be useful in the coping process of this population. Results of this study also call into question the applicability of the stress-and-coping theory for this chronically ill population. Therefore, it would be of benefit for future studies to compare PPS individuals' and non-PPS individuals' coping strategies for similar stressors to elucidate any different impact on psychological adaptation.

Although results did not support the hypotheses, other findings were of particular interest in regard to the psychological adaptation of PPS persons. First, it was found that the somatization symptom domain was predicted by unique measures of disease severity and perception of PPS-related stress severity. These findings suggest that future clinical evaluations of PPS persons would be clarified if somatic elements were interpreted separately from other components of psychological adaptation.

Second, the perception of non-PPS-related stressful event severity was a consistent predictor across the three remaining symptom domains (depression, anxiety, and hostility). What used to be simple tasks, may now be difficult and influence their perception of increased severity of those same hassles, and, ultimately have an impact on psychological adaptation. It would be interesting for future studies to investigate what aspects of PPS contribute to the perception of the severity of stressful events. In other words, what makes daily hassles stressful for PPS individuals? It was clear from this study thta cognitive appraisal of the controllability of stressful events was not an integral variable in the coping process. It may be that the level of uncertainty related to PPS progression would have had more of an influence on coping than perceived controllability and should be included in future research efforts with this population.

Another variable not included in this study which could have been a mediating factor related to psychological adaptation was that of social support. A study by Vitaliano et al. (1990) indicted that individuals coped with serious health problems by primarily seeking social support. Thus, future studies with PPS persons would likely be clarified if a measure of social support was integrated into the prediction of psychological adaptation. Further investigation of gender issues and PPS may better define possible men's issues and PPS. An interesting avenue may be how their roles or response sets have changed since experiencing PPS symptomatology. Also, further breakdown of the problem and emotion-focused coping strategies (i.e., confrontive coping, seeking social support, planful problem-solving, etc.) may be necessary to more clearly define the coping process.

This study has important implications for the assessment and treatment of PPS individuals. For instance, in a recent study (Clark, Dinsmore, Grafman, & Dalakas, 1994) of females with PPS it was found that although they had significantly more somatic complaints, the development or severity of PPS was not due to or influenced by underlying psychopathology. This in concert with the findings in this study indicate the need to examine somatic complaints in PPS individuals separately, and not include them in the estimation of psychological adaptation.

The other strong implication for this study is in the psychological treatment of PPS individuals. Clearly their perception of the severity of daily life hassles contributes in some manner to their overall psychological health. Clinical practitioners who treat these individuals need to attend to what real or cognitive distortions are manifesting in negative feelings, anxiety, and frustrations. In addition, health service providers should also take gender and possible role changes into consideration when advising PPS persons to obtain assistive technology, pace themselves, or delegate tasks. Resistance to these forms of treatment may be related to difficulty in changing role identity. Practitioners may want to encourage PPS individuals to become involved in moderated activist roles, grandparent roles, or ADA. This is supported in a study by Tate, et al. (1994) where nondepressed persons with late effects of poliomyelitis engaged in positive self-acceptance, information-seeking/sharing about the disability, and social activism. Finally, although PPS persons may have new limitations, they should be encouraged to employ as many problem-focused activities as possible to best predict favorable adaptation.

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APPENDIXES

APPENDIX A

BACKGROUND INFORMATION

Background Information

INSTRUCTIONS: Please fill out the following form.

1. Age _____

2. Gender M or F (circle one)

3. How many individuals reside in your household? _____

4. What is your marital status?
_____ Married
_____ Divorced
_____ Widow (er)
_____ Separated
_____ Never Married

5. What is your occupation? ______________________

6. At what age did you contract Poliomyelitis? _____

7. Please list the body parts that are affected by post-polio syndrome.
(mark all that apply with an X)
L R
__ __ Foot
__ __ Ankle
__ __ Knee
__ __ Leg
__ __ Hip
__ __ Back
__ __ Shoulder
__ __ Arm
__ __ Elbow
__ __ Wrist

8. At what age were you diagnosed with Post-polio Syndrome? _____

9. Do you attend post-polio support group? Yes or No (circle one)

10. What assistive technology devices do you utilize?
_____ Respiratory Aids
_____ Splinting
_____ Bracing
_____ Wheelchair Use: Full Time _____ Partial Use _____
_____ Other Equipment
____

APPENDIX B

MHAQ-P AND MHAQ-D

Daily Activity Difficulty

INSTRUCTIONS:
Below are questions that ask you to tell us how much difficulty you experience in performing daily activities. Please circle 1, 2, 3, or 4 to indicate how often you experience difficulty in performing these activities.

Are you able to:

1. Dress yourself, including tying shoe laces and doing buttons.

1	**2**	**3**	**4**
Without **ANY** difficulty	With **SOME** difficulty	With **MUCH** difficulty	**UNABLE** to do

2. Get in and out of bed.

1	**2**	**3**	**4**
Without **ANY** difficulty	With **SOME** difficulty	With **MUCH** difficulty	**UNABLE** to do

3. Lift a full cup or glass to your mouth.

1	**2**	**3**	**4**
Without **ANY** difficulty	With **SOME** difficulty	With **MUCH** difficulty	**UNABLE** to do

4. Walk outdoors on flat ground.

1	**2**	**3**	**4**
Without **ANY** difficulty	With **SOME** difficulty	With **MUCH** difficulty	**UNABLE** to do

5. Wash and dry your entire body.

1	**2**	**3**	**4**
Without **ANY** difficulty	With **SOME** difficulty	With **MUCH** difficulty	**UNABLE** to do

6. Bend down to pick up clothing from the floor.

1	**2**	**3**	**4**
Without **ANY** difficulty	With **SOME** difficulty	With **MUCH** difficulty	**UNABLE** to do

7. Turn faucets on and off.

1	**2**	**3**	**4**
Without **ANY** difficulty	With **SOME** difficulty	With **MUCH** difficulty	**UNABLE** to do

8. Get in and out of a car.

1	**2**	**3**	**4**
Without **ANY** difficulty	With **SOME** difficulty	With **MUCH** difficulty	**UNABLE** to do

Daily Activity Pain   Subject #________

INSTRUCTIONS:
Below are questions that ask you to tell us how much <u>pain</u> you experience in performing daily activities. Please circle 1, 2, 3, or 4 to indicate how often you experience <u>pain</u> in performing these activities.

Is it painful to:

1. Dress yourself, including tying shoe laces and doing buttons.

1	**2**	**3**	**4**
Never	**Sometimes**	**Most of the time**	**Always**

2. Get in and out of bed.

1	**2**	**3**	**4**
Never	**Sometimes**	**Most of the time**	**Always**

3. Lift a full cup or glass to your mouth.

1	**2**	**3**	**4**
Never	**Sometimes**	**Most of the time**	**Always**

4. Walk outdoors on flat ground.

1	**2**	**3**	**4**
Never	**Sometimes**	**Most of the time**	**Always**

5. Wash and dry your entire body.

1	**2**	**3**	**4**
Never	**Sometimes**	**Most of the time**	**Always**

6. Bend down to pick up clothing from the floor.

1	**2**	**3**	**4**
Never	**Sometimes**	**Most of the time**	**Always**

7. Turn faucets on and off.

1	**2**	**3**	**4**
Never	**Sometimes**	**Most of the time**	**Always**

8. Get in and out of a car.

1	**2**	**3**	**4**
Never	**Sometimes**	**Most of the time**	**Always**

APPENDIX C

EXAMPLE OF DAILY DIARY

DAILY DIARY INSTRUCTIONS:

Take a few moments and think about the stressful events that happened during the day. By "stressful" we mean a situation that was difficult or troubling for you, either because you felt distressed about what happened, or because you had to use considerable effort to deal with the situation. It may be that no stressful events happen in one day, and the next day several may occur. We would like you to limit your documentation of stressful events that occur in one day to a maximum of 5 .

We would like you to write down **two different categories** of stressful events that happened in your day. One category will be **disability-related stressful events**, and the other category will be **nondisability-related stressful events**. By "disability-related events" we mean a situation that is directly related to post-polio symptoms. It might have been having difficulty getting into a building, having trouble with your doctor, having your equipment break down, or something else. By "nondisability-related events" we mean a situation such as a discussion or confrontation with someone close to you, a problem at work, a problem with your car, or something else.

We would also like you to give each stressful event a rating. The rating scale ranges from 1 to 10. Giving a stressful event a rating of 1 indicates that it was not a very stressful event. Giving a stressful event a rating of 10 indicates that it was an extremely stressful event.

At the end of each week you will be asked to fill out two questionnaires related to the stressful events that you encountered during the past week.

DAILY DIARY (DAY 1)

Disability-related Stressful Events	Rating	Nondisability-related Stressful Events	Rating
1. ________________________________ ________________________________ ________________________________	____	1. ________________________________ ________________________________ ________________________________	____
2. ________________________________ ________________________________ ________________________________	____	2. ________________________________ ________________________________ ________________________________	____
3. ________________________________ ________________________________ ________________________________	____	3. ________________________________ ________________________________ ________________________________	____
4. ________________________________ ________________________________ ________________________________	____	4. ________________________________ ________________________________ ________________________________	____
5. ________________________________ ________________________________ ________________________________	____	5. ________________________________ ________________________________ ________________________________	____

Rating Scale

1	2	3	4	5	6	7	8	9	10
Not Very Stressful									Extremely Stressful

APPENDIX D

EXAMPLE OF WAYS OF COPING QUESTIONNAIRE (WOCQ)

Ways of Coping
WEEK 1: Disability-Related Stressor

INSTRUCTIONS: Take a few moments to review the **DISABILTY**-related stressful events you entered in this past weeks daily diary. Choose the most stressful **DISABILITY**-related event that you encountered in the past week, then answer the following questions with respect to that single event. How did you cope with the **DISABILITY**-related event? Read each statement and circle the number that best describes how much you used each strategy for coping with that single most stressful DISABILITY-related event that you encountered this week.

		Not used	Used somewhat	Used quite a bit	Used a great deal
1.	Just concentrated on what I had to do next--the next step.	0	1	2	3
2.	I tried to analyze the problem in order to understand it better.	0	1	2	3
3.	Turned to work or substitute activity to take my mind off things.	0	1	2	3
4.	I felt that time would make a difference — the only thing to do was to wait.	0	1	2	3
5.	Bargained or compromised to get something positive from the situation.	0	1	2	3
6.	I did something which I didn't think would work, but at least I was doing something.	0	1	2	3

		Not used	Used some-what	Used quite a bit	Used a great deal
7.	Tried to get the person responsible to change his or her mind.	0	1	2	3
8.	Talked to someone to find our more about the situation.	0	1	2	3
9.	Criticized or lectured myself.	0	1	2	3
10.	Tried not to burn my bridges, but leave things open somewhat.	0	1	2	3
11.	Hoped a miracle would happen.	0	1	2	3
12.	Went along with fate; sometimes I just have bad luck.	0	1	2	3
13.	Went on as if nothing had happened.	0	1	2	3
14.	I tried to keep my feelings to myself.	0	1	2	3
15.	Looked for the silver lining, so to speak; tried to look on the bright side of things.	0	1	2	3
16.	Slept more than usual.	0	1	2	3
17.	I expressed anger to the person(s) who caused the problem.	0	1	2	3

		Not used	Used somewhat	Used quite a bit	Used a great deal
18.	Accepted sympathy and understanding from someone.	0	1	2	3
19.	I told myself things that helped me to feel better.	0	1	2	3
20.	I was inspired to do something creative.	0	1	2	3
21.	Tried to forget the whole thing.	0	1	2	3
22.	I got professional help.	0	1	2	3
23.	Changed or grew as a person in a good way.	0	1	2	3
24.	I waited to see what would happen before doing anything.	0	1	2	3
25.	I apologized or did something to make up.	0	1	2	3
26.	I made a plan of action and followed it.	0	1	2	3
27.	I accepted the next best thing to what I wanted.	0	1	2	3
28.	I let my feelings out somehow.	0	1	2	3
29.	Realized I brought the problem on myself.	0	1	2	3

		Not used	Used some-what	Used quite a bit	Used a great deal
30.	I came out of the experience better than when I went in.	0	1	2	3
31.	Talked to someone who could do something concrete about the problem.	0	1	2	3
32.	Got away from it for a while; tried to rest or take a vacation.	0	1	2	3
33.	Tried to make myself feel better by eating, drinking, smoking, using drugs or medication, etc.	0	1	2	3
34.	Took a big chance or did something very risky.	0	1	2	3
35.	I tried not to act too hastily or follow my first hunch.	0	1	2	3
36.	Found new faith.	0	1	2	3
37.	Maintained my pride and kept a stiff upper lip.	0	1	2	3
38.	Rediscovered what is important in life.	0	1	2	3
39.	Changed something so things would turn our all right.	0	1	2	3
40.	Avoided being with people in general.	0	1	2	3

		Not used	Used somewhat	Used quite a bit	Used a great deal
41.	Didn't let it get to me; refused to think too much about it.	0	1	2	3
42.	I asked a relative or friend I respected for advice.	0	1	2	3
43.	Kept others from knowing how bad things were.	0	1	2	3
44.	Made light of the situation; refused to get too serious about it.	0	1	2	3
45.	Talked to someone about how I was feeling.	0	1	2	3
46.	Stood my ground and fought for what I wanted.	0	1	2	3
47.	Took it out on other people.	0	1	2	3
48.	Drew on my past experiences; I was in a similar situation before.	0	1	2	3
49.	I knew what had to be done, so I doubled my efforts to make things work.	0	1	2	3
50.	Refused to believe that it had happened.	0	1	2	3

		Not used	Used some-what	Used quite a bit	Used a great deal
51.	I made a promise to myself that things would be different next time.	0	1	2	3
52.	Came up with a couple of different solutions to the problem	0	1	2	3
53.	Accepted it, since nothing could be done.	0	1	2	3
54.	I tried to keep my feelings from interfering with other things too much.	0	1	2	3
55.	Wished that I could change what had happened or how I felt.	0	1	2	3
56.	I changed something about myself.	0	1	2	3
57.	I daydreamed or imagined a better time or place than the one I was in.	0	1	2	3
58.	Wished that the situation would go away or somehow be over with.	0	1	2	3
59.	Had fantasies or wishes about how things might turn out.	0	1	2	3

		Not used	Used somewhat	Used quite a bit	Used a great deal
60.	I prayed.	0	1	2	3
61.	I prepared myself for the worst.	0	1	2	3
62.	I went over in my mind what I would say or do.	0	1	2	3
63.	I thought about how a person I admire would handle this situation and used that as a model.	0	1	2	3
64.	I tried to see things from the other person's point of view.	0	1	2	3
65.	I reminded myself how much worse things could be.	0	1	2	3
66.	I jogged or exercised.	0	1	2	3

INSTRUCTIONS:

Again, think about the stressful event you chose for this questionnaire. Rate the extent to which this stressful event was one "that you could change or do something about" (controllable), or "that you had to accept" (uncontrollable).

<u>Rating Scale</u>

1	2	3	4	5
Controllable				Uncontrollable

APPENDIX E

BRIEF SYMPTOM INVENTORY

(BSI)

SYMPTOM CHECKLIST

INSTRUCTIONS: Below is a list of problems people sometimes have. Please read each one carefully, and circle the response that best describes HOW MUCH THAT PROBLEM HAS DISTRESSED OR BOTHERED YOU DURING THE PAST 7 DAYS INCLUDING TODAY. Only circle one number for each problem and do not skip any items.

HOW MUCH WERE YOU DISTRESSED BY:

	Not at all	A little bit	Moderately	Quite a bit	Extremely
1. Nervousness or shakiness inside.	0	1	2	3	4
2. Faintness or dizziness.	0	1	2	3	4
3. The idea that someone else can control your thoughts.	0	1	2	3	4
4. Feeling others are to blame for most of your troubles	0	1	2	3	4
5. Trouble remembering things.	0	1	2	3	4
6. Feeling easily annoyed or irritated.	0	1	2	3	4
7. Pains in heart or chest.	0	1	2	3	4
8. Feeling afraid in open spaces or on the streets.	0	1	2	3	4
9. Thoughts of ending your life.	0	1	2	3	4
10. Feeling that most people cannot be trusted.	0	1	2	3	4
11. Poor appetite.	0	1	2	3	4
12. Suddenly scared for no reason.	0	1	2	3	4
13. Temper outbursts that you could not control.	0	1	2	3	4
14. Feeling lonely even when you are with people.	0	1	2	3	4

HOW MUCH WERE YOU DISTRESSED BY:

	Not at all	A little bit	Moderately	Quite a bit	Extremely
15. Feeling blocked in getting things done.	0	1	2	3	4
16. Feeling lonely.	0	1	2	3	4
17. Feeling blue.	0	1	2	3	4
18. Feeling no interest in things.	0	1	2	3	4
19. Feeling fearful.	0	1	2	3	4
20. Your feelings being easily hurt.	0	1	2	3	4
21. Feeling that people are unfriendly or dislike you.	0	1	2	3	4
22. Feeling inferior to others.	0	1	2	3	4
23. Nausea or upset stomach.	0	1	2	3	4
24. Feeling that you are watched or talked about by others.	0	1	2	3	4
25. Trouble falling asleep.	0	1	2	3	4
26. Having to check an double-check what you do.	0	1	2	3	4
27. Difficulty making decisions.	0	1	2	3	4
28. Feeling afraid to travel on buses, subways, or trains.	0	1	2	3	4
29. Trouble getting your breath.	0	1	2	3	4
30. Hot or cold spells.	0	1	2	3	4
31. Having to avoid certain things, places, or activities because they frighten you.	0	1	2	3	4
32. Your mind going blank.	0	1	2	3	4

HOW MUCH WERE YOU DISTRESSED BY:

	Not at all	A little bit	Moderately	Quite a bit	Extremely
33. Numbness or tingling in parts of your body.	0	1	2	3	4
34. The idea that you should be punished for your sins.	0	1	2	3	4
35. Feeling hopeless about the future.	0	1	2	3	4
36. Trouble concentrating.	0	1	2	3	4
37. Feeling weak in parts of your body.	0	1	2	3	4
38. Feeling tense or keyed up.	0	1	2	3	4
39. Thought of death or dying.	0	1	2	3	4
40. Having urges to beat, injure, or harm someone	0	1	2	3	4
41. Having urges to break or smash things.	0	1	2	3	4
42. Feeling very self-conscious with others.	0	1	2	3	4
43. Feeling uneasy in crowds, such as shopping or at a movie.	0	1	2	3	4
44. Never feeling close to another person.	0	1	2	3	4
45. Spells of terror or panic.	0	1	2	3	4
46. Getting into frequent arguments.	0	1	2	3	4
47. Feeling nervous when you are left alone.	0	1	2	3	4
48. Others not giving you proper credit for your achievements.	0	1	2	3	4
49. Feeling so restless you couldn't sit still.	0	1	2	3	4

HOW MUCH WERE YOU DISTRESSED BY:

	Not at all	A little bit	Moderately	Quite a bit	Extremely
50. Feelings of worthlessness.	0	1	2	3	4
51. Feeling that people will take advantage of you if you let them.	0	1	2	3	4
52. Feelings of guilt.	0	1	2	3	4
53. The idea that something is wrong with your mind.	0	1	2	3	4

APPENDIX F

INSTITUTIONAL REVIEW BOARD APPROVAL FORM

OKLAHOMA STATE UNIVERSITY
INSTITUTIONAL REVIEW BOARD
HUMAN SUBJECTS REVIEW

Date: 12-16-94 **IRB#:** AS-95-030

Proposal Title: STRESS, COPING, AND PSYCHOLOGICAL ADJUSTMENT OF INDIVIDUALS WITH POST-POLIO SEQUELAE

Principal Investigator(s): Richard Potts, Dawn Sanchez

Reviewed and Processed as: Expedited

Approval Status Recommended by Reviewer(s): Approved

APPROVAL STATUS SUBJECT TO REVIEW BY FULL INSTITUTIONAL REVIEW BOARD AT NEXT MEETING.
APPROVAL STATUS PERIOD VALID FOR ONE CALENDAR YEAR AFTER WHICH A CONTINUATION OR RENEWAL REQUEST IS REQUIRED TO BE SUBMITTED FOR BOARD APPROVAL.
ANY MODIFICATIONS TO APPROVED PROJECT MUST ALSO BE SUBMITTED FOR APPROVAL.

Comments, Modifications/Conditions for Approval or Reasons for Deferral or Disapproval are as follows:

Provisions received and approved.

Signature: ______________________ Date: February 8, 1995
Chair of Institutional Review Board

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VITA

Dawn I. Sanchez

Candidate for the Degree of

Doctor of Philosophy

Thesis: STRESS, COPING, AND PSYCHOLOGICAL ADAPTATION OF INDIVIDUALS WITH POST-POLIO SEQUELAE

Major Field: Psychology

Biographical:

Education: Graduated from Edmond Memorial High School, Edmond, Oklahoma in May 1983; received Bachelor of Arts degree in Psychology from the University of Tulsa, Tulsa, Oklahoma in May 1989; and received Master of Science degree in Psychology from Oklahoma State University, Stillwater, Oklahoma in July 1993. Completed the requirements for the Doctor of Philosophy degree in Clinical Psychology from Oklahoma State University, Stillwater, Oklahoma in December of 1996.

Experience: Clinical Experience: Veteran's Administration Medical Center (VAMC), Nashville, Tennessee (8/96-10/96); Vanderbilt University-VAMC Internship Consortium, Nashville, Tennessee (8/95-8/96); VAMC, Murfreesboro, Tennessee (5/95-8/95); Oklahoma Youth Center, Norman, Oklahoma (1/95-5/95); Griffin Memorial Hospital, Norman, Oklahoma (7/94-12/94); Marriage and Family Clinic, Stillwater, Oklahoma (8/92-7/94); Psychological services Center, Stillwater, Oklahoma (8/91-7/94). Teaching Experience: Introductory Psychology at Oklahoma State University. Research Experience: Oklahoma State University (8/90-12/96) and the University of Tulsa (8/89-5/90).

Professional Membership: American Psychological Association.