VALIDITY OF A BRIEF SELF-RATING VISUAL ANALOGUE PAIN QUESTIONNAIRE

DISSERTATION

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By

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It is believed by many researchers that little attention has been given to patients' perceptions of the impact of chronic pain on their lives. In recognition of this need, G. Frank Lawlis, C. Edward McCoy, and David K. Selby developed the Dallas Pain Questionnaire (DPQ) to assess the amount of chronic pain that affects four aspects (daily activities, work-leisure activities, anxiety-depression, and social interest) of the patients' lives.

The present study, conducted to validate the DPQ's statistical properties, first reviews the literature addressing the various theories and varieties of pain, its opiates, and the two current approaches to quantify pain. This study included a total of 143 subjects. Clinical subjects were 104 inpatients in the Spinal and Chronic Pain Center at Medical Arts Hospital and 15 chronic pain outpatients released to work. Normal subjects consisted of staffing personnel ($n = 13$) and flight assistance employees ($n = 11$). Both clinical and normal groups completed the DPQ. The Minnesota Multiphasic Personality Inventory (MMPI) was administered only to the clinical population.
Results suggest that the DPQ is both externally reliable (stability reliability coefficient of .970) as well as an internally consistent instrument. Two factors emerged from factor structure analysis. Factor one (63.2% of variance) represents functional activities. Factor two (8.3% of variance) represents emotional capacities. A correlation analysis suggests the concurrent validity of the psychological and functional factors of the DPQ. A t-test demonstrated that chronic pain patients have significantly higher DPQ's scores than normals.

Because these findings support its psychometric properties, the DPQ appears to have utility for clinical and research purposes. The findings, limitations, and implications of this study are detailed, as are suggestions for future research.
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CHAPTER I

VALIDITY OF A BRIEF SELF-RATING VISUAL ANALOGUE PAIN QUESTIONNAIRE

Pain is perhaps the most universal consequence of stress encountered by human beings. Regardless of sophisticated technological-surgical-medical advances and a broad wealthy pharmaceutical industry, pain continues to be a most common and ubiquitous symptom for which patients seek medical care (Achterberg & Lawlis, 1984; Lawlis & McCoy, 1983). It has been estimated that nearly 80 percent of Americans will experience a significant low back episode at some time in their lives. As a result of the extraordinary number of individuals with pain, more than 1,000 pain clinics have been developed in this country during the past 15 years (Mayer, Gatchel, Kishino, Keely, Mayer, Capra, & Mooney, 1986). While human suffering cannot be measured in monetary terms, the economic importance of low back pain can be illustrated by looking at this statement of Mayer et al. (1986):

With high costs related not only to medical and surgical care, but to injury litigation, workmen's compensation, long-term disability insurance and social security payments, as well as lost work time, chronic low back pain may be the most expensive "benign" condition in American today. (p. 54)
Since pain has traditionally been conceptualized as a neurophysiological event that signals tissue damage, research regarding pain mechanisms initially focused on its presumed nociception characteristics (Hinnant, 1985). This approach, however, has been highly controversial because after years of intense physiological research not one of the three conflicting theories (specificity, intensity, and emotional) of pain have been validated (Bonica, 1980). Recently, a radiographic imaging technique that has documented degenerative processes has demonstrated poor correlations between degenerative processes and symptomatology (Mayer et al., 1986). Yet, specific diagnoses based on pain have been difficult to make because there have been such large subjective components involved in evaluating pain complaints.

Sternbach (1968) has defined pain in a way which attempts to elucidate and be consistent with the multidimensional nature of the pain experience:

Pain is an abstract concept which refers to (1) a personal, private sensation of hurt; (2) a harmful stimulus which signals current or impending tissue damage; (3) a pattern of response which operates to protect the organism from harm. These responses can be described in terms which reflect certain concepts, i.e., in neurological, physiological, behavioral, and affective "language." (p. 21)
This renewed and increased interest in a multicomponent view of pain has led to investigations which sought to manipulate psychological variables in order to facilitate medical treatment. It is surprising that the increased understanding of psychological factors that modulate pain has not greatly influenced the procedures utilized to assess chronic pain (Turky, Jamner, & Friedman, 1982). Several studies have examined variables such as pain intensity and duration (Frederiksen, Lynd, & Ross, 1978; Reading, 1980; Wolf, 1978), and little attention has been paid to the concept of pain disability in which chronic pain interferes with a person's ability to engage in various life activities (Pollard, 1984). Pollard's assumption acknowledges the complex interplay among variables such as intensity, extent, and duration, in addition to other factors which are not aspects of pain itself, including emotional and cognitive responses as well as environmental contingencies.

Theories of Pain

Philosophers, health care providers, religious leaders, and lay persons alike have speculated about the nature and cause of pain while seeking effective means of relief. For example, Aristotle, more than 2,500 years ago, had viewed pain as an emotion; Descartes, in contrast, viewed it solely as the result of physical stimuli impinging upon the body. Religious leaders, on the other hand, have suggested that pain is imposed by God, as either a test of faith or a form
of punishment for original or other sins (Turk, Meichenbaum, & Genest, 1983). Nevertheless, how a patient and therapist view pain will determine the strategies employed to alleviate it.

Nigl (1984) reported that Schieff in 1958 proposed the specificity theory of pain which was the first systematic physiological explanation for the pain experience. The specificity theory maintained that pain is a specific sensation, independent from the other senses, in which the transmission of pain information was thought to be along a direct path from peripheral pain receptors to a pain center in the brain. These sensors were free nerve endings or nociceptors which were excited by pain stimuli. Their impulses were supposed to be carried by A-delta and C fibers at the peripheral level and by the lateral spinothalamic tract in the spinal cord to a pain center located in the thalamus (Malzack & Wall, 1965). This "nociceptive model" could not, however, explain identifiable differences in pain stimuli. It was assumed that the pain-triggered impulses always resulted in pain experienced in direct proportion to the amount of input at the receptor (Melzack, 1973).

According to Nigl (1984), Erb in 1874 proposed an intensive theory of pain. The theory held that every sensory stimulus was potentially pain-producing if it exceeded a certain threshold for intensity. The intensive
theory was later embraced by early psychologists such as Wundt and Titchner.

One of the most influential variant of intensive theories, the pattern theory, was developed by Goldscheider (1894) in opposition to the specificity theory (Melzack & Wall, 1965). Goldscheider's work in this area led to the development of the idea that pain was the result of stimulus, intensity, and central summation, the key concepts behind the pattern theory (Bonica, 1980). Sternbach (1968) reported that variations of the pattern theory suggested that there was peripheral receptor and fiber specificity, but that central mechanisms controlled the perception of input. According to Fordyce (1976), pattern theory, in its contemporary form, accepted the concept of peripheral coding as well as the modulation of such coding by central inputs such as emotional state, previous experience, and attentional process. Pattern theory, however, does not adequately account for the physiological explanation for specific nerve fiber specialization or how such patterns are detected by central cells (Melzack & Wall, 1965).

A modern variant of the pattern theory has been termed the "gate control" theory. It was first developed by Melzack and Wall (1965, 1970) to account for many of the shortcomings and discrepancies between recently obtained, physiologic data and existing theories of pain. For example, scientific evidence of peripheral system
specialization supported part of the specificity theory but there was no empirical support for the assumption of a direct relation between pain intensity and pain perception. Bonica (1980) stated that available scientific evidence led Melzack and Wall to conclude that the quality and intensity of pain was multi-determined. Consequently, the gate control theory was formulated as a general theory which would allow explanation of the specialization of fibers and receptors, spatial and temporal patterning, and psychological process in pain perception and response. This theoretical model implies a combined mechanism which accounts for the interaction of three systems. The gate control theory, in the authors' words, suggested the following:

(i) the substantia gelatinosa functions as a gate control system that modulates the afferent patterns before they influence the T cells; (ii) the afferent patterns in the dorsal column system act, in part at least, as a central control trigger which activates selective brain processes that influence the modulating properties of the gate control system; and (iii) the T cells activate neural mechanisms which comprise the action system responsible for response and perception.

(Melzack & Wall, 1965, p. 974)

Based on Melzack and Wall's hypothesis, the following sequence of events is thought to occur when pain is transmitted from the periphery. The large fibers that enter
the dorsal horn apparently synapse with the stimulate T cell (e.g., large transmission cells in the nucleus proprius) and substantia gelatinosa cells (SC). Presynaptic inhibition of both large and small fibers is caused by the SG cells; an input of large fibers causes a slight response in T cells but interferes with further input. Inputs delivered by small afferent fibers activate T cells and consequently disinhibit synapses made by large fibers. This would make inputs from these fibers more likely to excite the T cells. Considering all of these facts, the end result is that large fiber inputs reduce transmission, whereas small fiber inputs open the "gate," with pain resulting when T cells discharge at a rate determined by higher centers (Fischer-Williams, Nigl, & Sovine, 1981). Melzack (1980) stated that sensory input is modulated at successive synapses from the spinal cord to the neural areas that regulate pain; the perception of pain occurs when the quality of nerve impulses exceeds a critical level. In other words, the gate control theory holds that the perception of pain and the response is a very complex interaction of sensory-discriminative, motivational-affective, and cognitive-evaluative components. The sensory-information system projects through the spinothalamic fibers to the thalamus and somatosensory cortex, and the motivational-affective conduction system is by way of an ascending pathway reaching the reticular formation, the thalamus, and limbic system. It is believed
that even though the motivational-emotional system is activated concurrently with the sensory system, the motivational-affective system may be partly aroused in reaction to the sensory component. In addition, it is suggested that the somatic input is modulated by the influences of cognitive, emotional, and behavioral factors prior to pain perception (Melzack & Wall, 1965; Turk et al., 1983). Anatomically, Melzack and Wall (1965) explain that the transmission of the more generalized sensory-information system is via large diameter highly myelinated fibers, and the smaller less myelinated fibers transmit more specific perceptions. If the large fibers are stimulated simultaneously with the smaller ones, the theory proposes that the "gate" should be closed and suffering may be reduced. From this theoretical argument, a treatment was developed called transcutaneous electrical stimulation (TES) or transcutaneous electrical nerve stimulation (TENS), in which pain is relieved by superficial stimulation of the large fibers through the skin surface.

Nigl (1984) emphasizes that convincing evidence for some aspect of the gate theory can be found in the fact that large fibers inhibit pain transmission; however, there is considerable controversy as to the validity of the gate control theory at present. Fischer-Williams et al. (1981), presented two cogent arguments against its validity: (a) dorsal horn cell have been identified that respond
selectively to noxious stimuli, and (b) natural or nonelectrical stimulation of small afferent fibers resulted in negative, not positive, dorsal root potential. In addition, Perl (1980) asserts that any pain theory must account for a central capability of differentiating between all the innocuous stimuli and those which are noxious in a manner which is predictable and consistent. Perl does not believe that specificity of function can be used alone to account for all situations involving nociception. Sensory pain can be modified in a number of ways and although there appears to be a set of neural mechanisms for pain, pain may arise from other neural and sensory circumstances originating in different areas of the central nervous system. Perl's argument may be considered as a contemporary alternative to the gate control theory (Nigl, 1984).

Although contradictory evidence has recently accumulated which seriously questions the gating hypothesis, the historic significance of the gate control theory cannot be overemphasized. According to Bonica (1980), Melzack and Wall's theory helped reintroduce electrical stimulation as a therapeutic modality and created a tremendous upsurge of electrophysiologic and neurochemical research on pain mechanisms. The gate-control theory of pain also has assisted in broading the scope of definitions of pain and treatment approaches. This multidimensional view of pain which suggests that psychology has much to contribute to the understanding and treatment of pain is consistent with the
growing field of behavioral medicine or health psychology (Turk et al., 1983).

Varieties of Pain

Because of the fact that pain varies in duration, intensity, quality, and its meaning, it has been helpful to attempt to categorize or distinguish among different types of pain. Pain fibers, that ascend or descend via the lateral spinothalamic fasciculus, are connected to the spinal cord through the spinal ganglion and dorsolateral fasciculus, they terminate on neurons in the dorsal horn of the cord gray matter also called substantia gelatinosa. The intensity of pain signals can be modified markedly as they pass through the neuronal synapses of the gray matter of the dorsal horns, especially in response to simultaneous signals transmitted by mechanoreceptors sensory nerve fibers and in response to signals entering the dorsal horns from the brain via corticofugal fibers. According to Guyton (1986), as the pain pathways pass into the brain, they separate into two channels or pathways, the "pricking pathway" and the "burning/aching pathway." The pricking pain pathway terminates in the ventrobasal complex in close association with areas of termination of the tactile sensation fibers of the both the dorsal-leminiscal system and the spinothalamic system. From here signals are transmitted into other areas of the thalamus and to the somatic sensory cortex. The pricking pain pathway, therefore, is more a sensory mode of
perception thought to be more important for localizing pain and not interpreting it. The burning and aching pain fibers terminate in the reticular area of the brain stem and in the intralaminar nuclei of the thalamus that are both parts of the reticular activating system which sends signals to all parts of the brain, especially the thalamus, hypothalamus, and cerebral cortex. The signals that are transmitted through the burning pain pathway can be localized only to very gross areas of the body. Since the higher cortical process is very important in individuals' perceptions and reactions to pain, the cerebral cortex may be involved in the qualitative interpretation of the pain stimulus. All these complex mechanisms somehow demonstrate the relevance of cognitive, attentional, and behavioral process in pain management (Pomerleau & Brady, 1979).

Melzack and Wall (1970) emphasized the relevance of the time-course of pain. Transient pain was described as pain of brief duration and little consequence. Usually there has been little damage and rarely has there been any accompanying preoccupation or anxiety. The prick of a hypodermic or stubbed toe would exemplify this type of pain. Acute pain, on the other hand, has usually involved a combination of pain, tissue damage, and anxiety. The anxiety may have been related to the treatment attempts for relief of the pain. There may have been anxiety and fear of future consequences and the possibility of death or prolonged suffering.
Chronic pain is recognized as pain that persists and becomes debilitating. Chronic pain becomes a pain syndrome which does not respond to treatments that are normally effective for acute pain. Chronic pain patients have usually experienced anxiety, preoccupation with bodily processes, depression, and a sense of hopelessness. This type of pain has required an elaborate search for treatment and there has normally been a significant variance between the amount of pain and the extent of the tissue damage found. This discrepancy in addition to the high percentage of treatment failures creates suspicion among physicians and other health care providers, and often the patient is considered to have a psychological problem.

Beecher (1956) has studied the relationship of the significance of the wound to the pain experience. In this classical study, evidence was found for a marked functional or psychogenic component to the subjective pain experience which prompted a renewed and expanded interest in pain research. Chronic pain that persists after routine medical and/or surgical interventions frequently is classified as a psychogenic pain in contrast with the organic pain that has resulted from detectable tissue damage. Traditional psychological theories have suggested that individuals develop pain as a psychological defense mechanism. In other words, hypochondriacal defenses would allow individuals to avoid dealing with intrapsychic conflicts by focusing on
physical complains. Clinically, these individuals are defined by the presentation of persistent pain complaints without any evidence of organic pathology, while individuals with definable organic pathology have been assumed to have "real" pain. Trief, Elliott, Stein, and Frederickson (1987) have suggested that the distinction between functional and organic patients should be discarded.

Turk et al. (1983) have categorized pain into five different types: (a) acute pain, usually a limited pain of six months or less, (b) chronic, periodic pain which is frequently an intermittent recurring pain such as migraine headache; (c) chronic, intractable, benign pain, which is usually ever present but to a varying degree of intensity such as low back pain; (d) chronic progressive pain, such as the pain associated with cancer; and (e) experimentally-induced pain of the type used in the research laboratory.

Researchers (Achterberg & Lawlis, 1980; Turk et al, 1983), having recognized the diversity types of pain as well as the difficulties in determining appropriate treatment procedures, have suggested that health practitioners must learn to recognize that chronic pain is not due to isolated causes but is instead the result of multiple, interactive causes.

After headache, low back pain has been estimated to be the most commonly experienced, prevalent, and debilitating problem that has originated from many sources.
For instance, one needs only to consider the anatomy of the spinal column, its structure, and its relationship with many organs to understand how broad in range the dysfunction may be. A study by Brown (1975) noted six classes of physiological spinal pain syndromes: (a) A spondylogenic syndrome, was identified by pain caused by disease of the intervertebral disc accompanied by mechanical deficiency and osteoarthritis. Many of the pain sensations in this disorder were explained as a result of muscle spasms secondary to the spinal column tissue damage; (b) Osteogenic syndromes were defined as a pain symptom due to the presence of a lesion or inflammation of rheumatoid spondylitis; (c) Neurogenic pain syndromes were found to result from compression of spinal nerve root or neoplasm in the spinal cord; (d & e) Vascular and viscerogenic pain syndromes were defined by changes in the blood vessels of facies surrounding the organs and cavities near the spinal column; and (f) Iatrogenic pain syndrome which may result from previous medical treatment. Spinal stenosis, pseudoarthritis, and neural adhesions may result from surgical procedures. These conditions may lead to postoperative pain and a diminution of relief from surgical correction of the original problem.

In addition to the physiological spinal pain, Jacobson (1970) described three types of tension-pain disorders. Primary disorders were reported to be a result of physical or
mental exhaustion and fatigue which could lead to headache or backache. The secondary disorder was defined as the result of pain caused by an organic cause which could lead to the pain-tension-pain cycle. Back pain patients tend to brace themselves in an attempt to reduce movement of the spinal column. The restriction of movement leads to a reduction of elasticity, range of motion, and the tightened painful muscle groups. Finally, Jacobson described the mixed tension-pain disorder which results in injury and pain due to physical activity and exertion while under emotional stress or adverse conditions.

Back pain may also be explained in physiological terms which is focused on muscle metabolism and ischemia. The contracted muscle has a reduced blood flow which may lead to metabolic waste products and chemical irritation of the fibers (Lamb, 1979; Simons, 1981).

Endogenous Opiates for Pain

Pain perception involves not only electrical impulses from afferent fibers but also neurochemical events involving endogenous opiate-like peptide molecules which are found throughout the ascending and descending pain pathways. According to Fischer-Williams et al. (1981), research has indicated that a large number of peptides may be produced in specific cells of the brain. With regard to this assumption, Pert, Snowman, and Snyder (1974) discovered that neurons in the brain contain specialized receptors that respond to
opiates. In their research into the neurochemistry of pain, Terenuis and Wahlstron (1975) reported the existence of a substance in human cerebrospinal fluid that had a specific affinity for opiate receptors that had been extracted from rat brains. They called this chemical morphine-like factors. Hughes, Smith, Kosterlitz, Fothergill, Morgan, and Morris (1975) suggested that the brain produces two morphine-like factors, which they identified as very small peptide chains, each containing five amino acids. They synthesized these substances and found that the artificial "enkephalins" acted as potent opiates. The two enkephalins, labeled leu-enkephalin and met-enkephalin, were found to bind with opiate receptors even more effectively than morphine.

Carlson (1986) reported that cells producing one of the endogenous opiates synthesize them and also synthesize specialized enzymes that cut the precursor peptides apart at specific locations. The active fragments are stored in vesicles, and the unneeded ones destroyed. Akil, Watson, Young, Lewis, Khachaturian, and Walker (1984) reported three precursors peptides. The first, pro-opiomelanocortin gives rise to several hormones found in the pituitary gland, only one of which serves an opiate-like function "beta-endorphin." Beta-endorphins are produced in the neuronal perikarya of the hypothalamus, the thalamus, amygdala, and the central gray matter which contains endorphin projections.
from the region of the arcuate nucleus of the hypothalamus. Although endorphins have not been located in the dorsal spinal cord, this does not mean that endorphins do not play a major in pain perception or inhibition. The second, pro-enkephalin, gives rise only to enkephalins of which there are several types. The enkephalins have been found mainly in those areas of the brain associated with pain control, including the periventricular area, the periaqueductal gray, the midline raphe nuclei, the substantia gelatinosa of the dorsal horns in the spinal cord, and the intralaminar nuclei of the thalamus. Finally, pro-dynorphin, that gives rise to several different kinds of dynorphins, another class of opiates that are active in the brain.

Sherman and Liebeskind (1980) stated that there is evidence that beta-endorphin-like materials can be found in cerebrospinal fluid after medial brain stem electrical stimulation has relieved pain. It has also been discovered that cerebrospinal fluid endorphin levels are lower in chronic pain patients that in normal subjects. This difference, however, only appears to be significant in chronic neurogenic pain; pain of psychogenic origin does not have the same effect (Almay, Johannson, Knorring, Terenius, & Wahlstrom, 1978).

Electrical stimulation of particular locations within the brain can cause analgesia (Reynolds, 1969). The most effective locations appear to be within the periaqueductal
gray matter and the rostroventral medulla. Mayer and Liebeskind (1974) reported that electrical stimulation of the periaqueductal gray matter produced analgesia in rats equivalent to that produced by at least 10 milligrams of morphine per kilogram of body weight, which is a large dose. Thus, analgesic brain stimulation apparently triggers the neural mechanisms that reduce pain. It is well known now, that the periaqueductal gray matter and the rostroventral medulla are two components of a pain-attenuating circuit, which inhibits the firing of neurons in the dorsal horn of the spinal cord gray matter, whose axons give rise to the spinothalamic tract. This activity directly diminishes the signal that gives rise to sensations of pain. In addition, local injections of opiates into the hypothalamus produces change in body temperature which suggests that endogenous opiates may play a role in thermoregulation (Martin & Bacino, 1978), and the administration of the drug naloxone reverses the effects of opiates, also disrupts thermoregulatory responses (Holaday, Wei, Loh, & Li, 1978). Endogenous opiates are also involved in the control of blood pressure (Holaday, 1983) and may even be involved in learning, especially in mechanisms of reinforcement (Belluzzi & Stein, 1982). Fields and Levine (1984) have suggested that expectation, environmental cues, stress, and pain may all activate the analgesic system. Their findings suggest the need for a reevaluation of the
analgesia mechanisms involved in acupuncture, hypnoses, and TENS.

Pain Measurement

The assessment of pain has traditionally been an unsolvable puzzle for both researchers and clinicians. This is in part because measuring pain involves a complex task directed to find out the degree which sensory, cognitive, and emotional factors, as well as socio-cultural based attitudes, affect the individual psychological "make up" when reporting pain (Clark, 1984). The measurement of pain, however, is essential not only for the study of pain mechanisms but also becomes critical for optimal treatment planning and for accurately evaluating treatment outcome (Kerns, Turk & Rudy, 1985).

According to Kalinowski (1985) description and comparison are the two intentions that lie behind any attempt to measure clinical pain. Measurement, in order to describe, always begins with the idea of a variable, the recognition or description of some regularity in our experience which can be described in terms of "more" or "less" (Loevinger, 1957; Masters, 1982; Thurstone, 1931; Wright & Masters, 1982; Wright & Stone, 1979). Variables have been made explicit by task or test items which have exposed the continuum of experience that has been part of our personal knowledge. By given the items to an appropriate sample of people and then calibrating them, one has
attempted to validate this personal conception of the variable by comparing this own ordering of the items (e.g., from easiest to hardest) with the ordering provided by our respondents. The ordering provided by our respondents gives us the operational definition of the variable, a description of the way things are in the target population. With it, as stated by Kalinowski (1985) "we move out of the real of personal knowledge and into the realm of scientific knowledge" (p. 330).

The second intention behind any attempt to measure pain has been the wish to compare: to compare yesterday's pain to today's, the pain of someone with a benign backache to that of someone with a malignant cancer, the pain you just notice to the pain you cannot stand. This comparative function of measurement has far and away been a dominant function in education and psychology ever since Binet (Binet & Simon, 1973) developed his standardized, norm-referenced intelligence test.

Historically, there have been two kinds of approaches in quantifying pain: (a) the use of laboratory techniques (e.g., tactile and pressure stimulation such as electric shock, stick with a pin, and douse in ice water) to produce and measure pain in people who are normally not experiencing pain: and (b) the use of tools (e.g., verbal measurement of standardized questionnaires, numerical, and visual scales) to measure or otherwise assess pain in patients who are
suffering acute or chronic pain. In agreement with these two perspectives, it is obvious that both types of methods are essential for the improvement of pain understanding and therapy (Melzack, 1983).

Laboratory techniques have often been crucial in order to carry out precise manipulation of variables in well controlled studies. Nevertheless, the results of the analogue studies have provided little in the way of understanding clinical pain, especially pain related to chronic disease or disability (Achterberg & Lawlis, 1984). Clark (1984) suggested that the ability to diagnose and treat pain has been in "sorry state" because nobody is able to quantify pain. He, also, stated that "we really do not know what clinical pain is, in fact, there is even very little agreement concerning the numbers and kinds of pain dimensions" (p. 350).

A more optimistic viewpoint has suggested that the most meaningful correlate of pain has been scaling methods either numerical or visual that have objectified the self-report of pain (Achterberg & Lawlis, 1984). Beecher (1959) has been credited with introducing the method of asking a patient to estimate pain on some scale (e.g., 0-7, 0-5, 0-100). These scales are verbally anchored, with "0" being no pain, and "100" or the largest number meaning intolerable, excruciating pain. These scales have been well tested and their validity
demonstrated in both behavioral and pharmacological research (Gracey, McGratha, & Dubner, 1978).

Scott and Huskisson (1976) argued that visual analogue scales further refine the numerical scales. With these, the pain patient is given a line of some length. The ends of the line are anchored with "no pain" and "excruciating pain" or similar words. Thus, the patient is asked to mark where his or her pain falls on the continuum. When the numerical scales have been compared with the visual analogue, the later have usually been found to be a superior method of communication (Achterberg & Lawlis, 1984). The visual analogue studies, therefore, have been found to give reliable and valid measurement of experimental as well as clinical pain (Harms-Ringdahl, Carlsson, Ekholm, Raustorp, Svensson, & Toresson, 1986).

According to Kerns et al. (1985) subjective evaluation of pain experience is likely to be an important factor in determining motivation for treatment and for treatment adherence. Moreover, patients' appraisals may have implications for the response of others, including health care professionals, as perceptions of life circumstances are likely to influence patients' communications with significant others. Fordyce (1983) has stated that the probability of sympathetic attempts to provide relief and comfort are directly proportional to the intensity of the pain complaint. Thus, patients' perceptions of the responses of
others to their suffering has been found to influence the patients' reports of pain intensity (e.g., Flor, Kerns & Turk, 1985), their mood (e.g., Kerns & Turk, 1984), and their behavior (e.g., Fordyce, 1976). Unfortunately, little attention has been given to the patients' perception of the impact of pain on their lives.

Based on a cognitive-behavioral perspective of chronic pain that emphasizes patients' perceptions and appraisals, a number of authors (Feverstein, Greenwald, Gamache, Papciak, & Cook, 1985; Keefe, 1982; Sanders, 1979; Turk & Kerns, 1983) have called for the development of comprehensive assessment protocols that are designed specifically for use with chronic pain patients. Along with this proposition Turk and Kerns (1983) have suggested that pain assessment should consist of a number of components including: evaluation of the patients' perception of different areas such as physical, emotional, cognitive, and behavioral; impact of pain on different aspects of the patients' life (e.g., marital, social, vocational), responses of significant others; and evaluation of the descriptive characteristics of the pain location, intensity, quality, and chronology of the pain experience and treatment.

Kerns et al. (1985) developed the West Haven-Yale Multidimensional Pain Inventory (WHYMPI) which attempts to fill a widely recognize void in the assessment of clinical pain. The instrument is a 52-item inventory that provides
information about three areas: (a) perceived pain intensity and the impact on various aspects of the patients' lives; (b) patients' perceptions of the responses of significant others to their communications of pain; and (c) frequency of patients' performance of common activities. The WHYMPI was designed to provide a brief but comprehensive assessment of the subjective experience of pain that could be included as part of an extended assessment protocol in conjunction with other procedures. The construction of WHYMPI is psychometrically sound and theoretically based on a cognitive-behavioral perspective. The sample consisted of 120 (81.5% male) chronic pain patients who were veterans of the United States Armed Service, generalizability of the results to samples of other groups of pain patients needs to be established (Kerns et al., 1985).

Recently, Tait, Pollard, Margolis, Duckro, and Krause (1987) developed the Pain Disability Index (PDI) which is a seven item instrument designed to be used as a part of a multifaceted clinical assessment battery. The PDI asks patients to rate their level of disability on a scale ranging from 0 (no disability) to 10 (total disability) in seven areas of activity, including family/home responsibility, recreation, social activity, occupation, sexual behavior, self care, and life support activity. Although the PDI scores may not be so meaningful a measure for patients with chronic, intermittent pain (e.g., migraine
headaches, tic douloureux) as for patients with chronic, unrelenting pain (e.g., low back pain, peripheral neuropathies), it provides important self-report information on levels of disability related to pain, which could be used in developing treatment plans.

Given the current status of research in this area and the need for a time-efficient assessment procedure based on a cognitive-behavioral perspective, the purpose of the present study is to validate a 16-item visual analogue scale, the Dallas Pain Questionnaire (DPQ; Lawlis, McCoy & Selby, 1987) that is designed to assess the impact of chronic pain in patient's daily-work-leisure activities, as well as perceived anxiety-depression and social interest.

Research Question

Are the 16 items of the DPQ reliable and appropriate questions to assess the percentage that chronic pain interferes or affects patient's daily and work-leisure activities, anxiety-depression, and social interest that are purported to be measured?
CHAPTER II

METHOD

Subjects

A total of 143 subjects, including both a clinical and a normal population, participated in this study. Part of the clinical population consisted of 104 subjects, 48 females and 56 males. Ages ranged from 21 to 61 years \((M = 37.3\) years). This group was classified as chronic pain patients by nature of their medical diagnosis and duration of pain. They were inpatients undergoing pain management training and treatment in a program that provides daily medical supervision, physical therapy, functional activities, biofeedback, imagery training, individual and group therapy. This program is designed and maintained by the Spinal and Chronic Pain Center, at Medical Arts Hospital, Dallas, Texas. The second part of the clinical population, denominated the chronic pain working category, included 10 males and five females. Ages ranged from 20 to 57 years \((M = 35.2\) years). This clinical subgroup consisted only of chronic pain patients that were released from the program to work. The normal group consisted of five men and 19 women, whose ages ranged from 25 to 56 years \((M = 39.2\)). The sample size of this group included 13 subjects that were drawn from staff members of Medical Arts Hospital and 11
flight assistance employees at Branniff Airlines, Dallas-Fort Worth, Texas.

Instruments

The DPQ, which is a 16-item visual analogue tool (see Appendix A), was developed by Lawlis et al. (1987) for the purpose of evaluating subject's cognitions about the percentage that chronic pain affects four aspects of the patients' lives: (a) daily activities including pain and intensity, personal care, lifting, walking, sitting, standing, and sleeping; (b) work and leisure activities including social life, traveling, and vocational; (c) anxiety-depression including anxiety and mood, emotional control, and depression; and (d) social interest that includes interpersonal relationship, social support, and punishing responses. Each item contains its own visual analogue scale (see Appendix A). The scales are divided into five to eight small segments in which the subject is asked to mark an "X" which indicates where his or her pain falls on that continuum. Fourteen out of 16 visual scales are anchored at the beginning with words such as "no pain" and zero percent, close to the middle "some," and at the end with "all the time" and 100 percent. Similar words are used according to the item's information. Two items, sections XI and XII (anxiety/mood and emotional control), are anchored in an opposite direction with 100 percent at the beginning of the scale and zero percent at the end. Psychopathology
in this case is indicated following that direction. One of the advantages of this time-efficient assessment and scoring procedures, is that the DPQ's 16-item visual analogue scale can be answered in three to five minutes and it is very easy to score and it can be done in 50-60 seconds or less.

The Minnesota Multiphasic Personality Inventory (MMPI) that was administered only to the chronic pain population, has long been the most important and widely used personality assessment device in this country (Nigl, 1984). The MMPI was originally developed by Starke Hathaway and J. Charnley McKinley (1967) of the University of Minnesota and is based on empirical discrimination between pathologic categories and normal individual's responses to items regarding their coping abilities and habits or histories. The MMPI consists of 566 true-false items and its profile or summary includes 10 clinical scales and three validity scales. The 10 clinical scales that have been related to psychopathology are the following: (1) Hypochondriasis (Hs), measures preoccupation or abnormal concern over bodily health; (2) Depression (D), measures symptoms of dissatisfaction and hopelessness; (3) Hysteria (Hy) measures the symptoms that describe a person who has somatic complains related to psychosomatic problems and denial; (4) Psychopathic deviate (Pd), measures amorality and asocialness; (5) Masculinity-Femininity (Mf), measures sexual attitude and sexual role stereotypes; (6) Paranoia (Pa), measures ideas of
reference, grandiosity and suspiciousness. This scale is considered to be the most critical in rehabilitation process because it indicates that the patient has little faith in other people, especially health care professionals; (7) Psychastenia (Pt), measures obsessive thought and compulsive behavior; (8) Schizophrenia (Sc), measures disturbance of thought process, mood, and action; (9) Hypomania (Ma) measures elevation of mood, flights of ideas that are related to impulsivity; (10) Social Introversions (Si), measures social withdrawal. The validity scales that determine some measure of trust in the test results are: L scale, that measures deliberate attempts to fake good, F scale, indicates deviant responses, and K scale, that measures defensiveness.

Procedure

Inpatients completed the DPQ and the MMPI as a part of a psychological assessment battery required by the program on the first day of admission. Even though the instructions were printed on the questionnaire (see Appendix A), assistance to the patients was provided by the examiner when extra explanation was needed. In order to obtain the DPQ's retest data, the subjects completed the visual analogue pain questionnaire after two days of interlude. The chronic pain working category completed the DPQ when returning to the hospital for a check-up based on one or two months follow-up. Part of the normal population pool was personnel with staffing
positions at Medical Arts Hospital who voluntarily completed the questionnaire. This group included physicians, psychologists, physical and occupational therapists, nurses, administrative coordinators, and secretaries. In the retest measure condition, the subjects completed the DPQ again after at least two hours later of being completed the inventory for the first time. The second part of the normal population pool were integrated from flight-workers with categories of flight assistance employed at Braniff Airlines, Dallas-Fort Worth, Texas. Through the manager of each section or department, the DPQ was delivered to the workers who completed the questionnaire. In order to score the DPQ, four percentages scores ranged from 0 to 100 were computed by summing the rating segments of each item and multiplying the total of each of the four sections by three and five respectively. The chronic pain patients' functional capacities which are related to physical demands characteristics of work, were evaluated through the department of occupational therapy at Medical Arts Hospital. Those functional capacities that were assessed at the beginning and end of the program, include: lifting, carrying, pushing, pulling, and sitting/standing tolerance. Two categories of the job status for chronic pain patients were considered: released to return to work versus unable to return to work at the time of release.
Hypotheses

Various correlational hypotheses were based on the principles of linear relationship and factor analysis to validate the DPQ under study.

**Hypothesis One**

It was predicted that reliability would be obtained on both chronic and normal populations based on test-retest correlational approaches.

**Hypothesis Two**

It was predicted that the DPQ would have content validity or consistent internal structure on those items that measure the trait or behavior of interest based upon factor analysis approaches and internal consistency measures.

**Hypothesis Three**

It was predicted that chronic pain patients’ psychological factors measured by the DPQ would significantly correlate with clinical scales of the MMPI (D, Hy, Pa, Pt, and Sc).

**Hypothesis Four**

It was predicted that chronic pain patients would differ from non-pain patients on all scales.

**Hypothesis Five**

It was predicted that chronic pain patients’ daily work-leisure activities, vocational and social scores would correlate with functional capacities measures and job status.
CHAPTER III

RESULTS

To test hypothesis one in which reliability was predicted based upon test-retest correlational approaches, stability coefficient was computed using the method described by Anastasi and Cronbach (1960, 1961). This computational analysis included both chronic pain patients \(n = 15\) and staffing personnel \(n = 13\). A stability reliability coefficient of .970 was derived, indicating that the DPQ is a reliable instrument over time \((p < .0001)\) that express the degree to which there is a consistency in measurement of the test scores. A separate analysis with the same sample size provided a stability coefficient for each category on the DPQ including: daily-work-leisure activities, anxiety-depression, and social interest (see Table 1). These results suggest that the factors of the DPQ are reliable externally. Item-total correlation also were computed and these ranged from \((r = .44, p < .05)\) to \((r = .94, p < .0001)\). All these correlations are highly significant and provide internal validity to support hypothesis one (see Table 2).

To assess the factor structure of the DPQ stated in hypothesis two, the data of 104 chronic pain patients were factor analyzed using a SPSSX Factor computer program.
Table 1

Coefficient of Stability for Each Category Clustered on the DPQ  N = 28.

<table>
<thead>
<tr>
<th>DPQ Categories</th>
<th>Stability Reliability Coefficient</th>
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<tr>
<td>Daily Activities</td>
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</tr>
<tr>
<td>Work/Leisure Activities</td>
<td>.984</td>
</tr>
<tr>
<td>Anxiety/Depression</td>
<td>.943</td>
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<tr>
<td>Social Interest</td>
<td>.966</td>
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</table>

(Norusis, 1985). Two factors emerged, factor one accounted for 63.2 percent of the variance, and factor two accounted for 8.3 percent. The criterion used to retain factors suggests to include only factors that account for variance < 1.00 (Kachingan, 1986). Table 3 shows the loading of the 16 DPQ variables on the two factors after varimax rotation. Inspection of the nine variables that loaded primarily on factor one suggested that it presents important functional activities that are essential for living. Factor two, in contrast, appears to represent emotional or cognitive capacities that are essential not only for living but also for a successful rehabilitation process. Factor structure analysis in addition to the significant correlations between items' scores and the percentages of each category on the DPQ (see Table 4) indicates that the questionnaire is an internally consistent instrument as predicted on hypothesis two. Finally similar to the functional and
### Table 2

**Item-Total Correlational Matrix**

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</tbody>
</table>

**Note.** 1 = Pain/Intensity; 2 = Personal Care; 3 = Lifting; 4 = Walking; 5 = Sitting; 6 = Standing; 7 = Sleeping; 8 = Social Life; 9 = Traveling; 10 = Vocational; 11 = Anxiety/Mood; 12 = Emotional Control; 13 = Depression; 14 = Interpersonal Relationship; 15 = Social Support; 16 = Punishing Responses.

* p < .01. ** p < .001. *** p < .0001.

N = 28.
Table 3
DFQ Factor Structure Matrix

<table>
<thead>
<tr>
<th>Variable</th>
<th>Factor I (functional)</th>
<th>Factor II (emotional)</th>
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<td>Emotional Control</td>
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N = 104.

emotional factors emerged on the study are the findings reported by Reading, Everitt, and Sledmere (1982) that provided positive evidence regarding construct validity of
Table 4

Correlation Coefficients Between Items' Scores and Percentages of the Four Categories on DPQ

<table>
<thead>
<tr>
<th>Category</th>
<th>Items</th>
<th>Daily Activities</th>
<th>Work/Leisure Activities</th>
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<th>Social Interest</th>
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<td></td>
<td>Punishing Responses</td>
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<td>.51**</td>
<td>.64**</td>
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</table>

*p < .01. **p < .0001 & beyond. N = 104.
sensory and affective dimensions of the McGill Pain Questionnaire.

In order to assess the DPQ's concurrent psychological validity, an analysis of Pearson product-moment correlation \( r \) was carried out including data from 104 chronic pain patients. Results indicate a highly significant positive correlation between psychological variables (anxiety-mood, emotional control, and depression) on category three (anxiety-depression) of the DPQ and five clinical scales (D, Hy, Pa, Pt, and Sc) of the MMPI (see Table 5). In this statistical analysis, it is relevant to notice the uniqueness or specific psychometric properties of each category clustered on DPQ. Category one (daily-activities) did not significantly correlate with clinical scales of the MMPI as did Category three (anxiety-depression). This difference on correlation coefficients suggest that each category on the DPQ has different statistical properties regarding dimensionality of the pain response.

A severity score was provided for each chronic patients based on MMPI profiles among patients with low back pain recently reported by Rosen, Grubman, Bevins, and Frymoyer (1987). In order to investigate the relationship between severity and percentages scores of the different categories on DPQ, a second correlational analysis was performed. The data indicate a significant positive correlation between severity and category three (anxiety-
depression) \( (r = .38, \ p < .001) \) and also severity and category four (social interest) \( (r = .26, \ p < .003) \) but no significant correlations were found between severity and categories one and two (daily-work-leisure activities). As predicted, both statistical analysis are consistent with hypothesis three in which concurrent psychological validity was predicted with regard to clinical utility of the DPQ.

Table 5

Pearson Correlations Coefficients Between Categories on the DPQ and Five Clinical Scales on the MMPI

<table>
<thead>
<tr>
<th>DPQ Categories</th>
<th>MMPI</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>D</td>
<td>Hy</td>
<td>Fa</td>
<td>Pt</td>
<td>Sc</td>
</tr>
<tr>
<td>Daily Activities</td>
<td>.01</td>
<td>.19</td>
<td>.04</td>
<td>.00</td>
<td>-.05</td>
</tr>
<tr>
<td>Work/Leisure Activities</td>
<td>.16*</td>
<td>.28**</td>
<td>.09</td>
<td>.17</td>
<td>.07</td>
</tr>
<tr>
<td>Anxiety/Depression</td>
<td>.39***</td>
<td>.33**</td>
<td>.36***</td>
<td>.52**</td>
<td>.42***</td>
</tr>
<tr>
<td>Social Interest</td>
<td>.15</td>
<td>.14</td>
<td>.28**</td>
<td>.28**</td>
<td>.28**</td>
</tr>
</tbody>
</table>

*p < .05.  **p < .002.  ***p < .0001.

N = 104.

In order to investigate concurrent functional validity from the working category of pain patients \( (n = 15) \) who were discharged to work by the Spinal and Chronic Pain Center, a Pearson product-moment correlation \( (r) \) was carried out.
The data indicate a significant negative correlation between functional capacities (physical demands characteristics of work) and categories one and two on the DPQ (see Table 6).

Table 6
Correlational Coefficients Between Functional Capacities Score and Percentages on DPQ Categories

<table>
<thead>
<tr>
<th>Functional Capacities</th>
<th>Daily Activities</th>
<th>Work/Leisure Activities</th>
<th>Anxiety/Depression</th>
<th>Social Interest</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lifting A</td>
<td>-.67*</td>
<td>-.66*</td>
<td>.06</td>
<td>.03</td>
</tr>
<tr>
<td>Lifting B</td>
<td>-.63*</td>
<td>-.61*</td>
<td>-.33</td>
<td>-.30</td>
</tr>
<tr>
<td>Lifting C</td>
<td>-.63*</td>
<td>-.63*</td>
<td>-.27</td>
<td>-.24</td>
</tr>
<tr>
<td>Carrying</td>
<td>-.66*</td>
<td>-.59*</td>
<td>-.28</td>
<td>-.25</td>
</tr>
<tr>
<td>Pushing A</td>
<td>-.41</td>
<td>-.13</td>
<td>-.25</td>
<td>-.20</td>
</tr>
<tr>
<td>Pushing B</td>
<td>-.43</td>
<td>-.27</td>
<td>-.28</td>
<td>-.15</td>
</tr>
<tr>
<td>Pulling A</td>
<td>-.30</td>
<td>-.07</td>
<td>-.29</td>
<td>-.29</td>
</tr>
<tr>
<td>Pulling B</td>
<td>-.34</td>
<td>-.30</td>
<td>-.25</td>
<td>-.22</td>
</tr>
<tr>
<td>Sitting</td>
<td>-.59*</td>
<td>-.70*</td>
<td>-.28</td>
<td>-.37</td>
</tr>
<tr>
<td>Standing</td>
<td>-.67*</td>
<td>-.69*</td>
<td>-.23</td>
<td>-.27</td>
</tr>
</tbody>
</table>

Note. Lifting A = Floor to knuckle; lifting B = 12" to knuckle; Lifting C = knuckle to shoulder. Pushing A = static, Pushing B = dynamic 15'; Pulling A = Static; Pulling B = Dynamic 15'.

*p < .01.

N = 15.
These negative correlation coefficients suggest that the higher the working capacities (lifting, carrying, sitting, and standing), the lower the percentages scores in reported pain on daily and work-leisure activities. Results indicate some empirical evidence with regard to concurrent functional validity on the DPQ that support hypothesis five.

To investigate the specific value for the difference regarding item-score between chronic pain patients (n = 104) and normals (n = 24), a t-test was performed. The data indicate that chronic pain patients had significantly higher DPQ's scores than normals (see Figure 1 and Table 7). These results provide some statistical evidence to support hypothesis four which predicted that chronic pain patients' scores will be higher than non-patients on all DPQ's scales.
Table 7

Means and Standard Deviation Scores of Chronic-Normal Populations on DPQ Scales

<table>
<thead>
<tr>
<th>Items</th>
<th>Population</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Chronic $n = 104$</td>
<td>Normals $n = 24$</td>
<td></td>
</tr>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
</tr>
<tr>
<td>Pain Intensity</td>
<td>2.47</td>
<td>1.60</td>
<td>0.37</td>
</tr>
<tr>
<td>Personal Care</td>
<td>2.36</td>
<td>0.85</td>
<td>0.08</td>
</tr>
<tr>
<td>Lifting</td>
<td>3.72</td>
<td>1.31</td>
<td>0.45</td>
</tr>
<tr>
<td>Walking</td>
<td>3.50</td>
<td>1.09</td>
<td>0.21</td>
</tr>
<tr>
<td>Sitting</td>
<td>3.19</td>
<td>0.91</td>
<td>0.29</td>
</tr>
<tr>
<td>Standing</td>
<td>3.62</td>
<td>1.01</td>
<td>0.50</td>
</tr>
<tr>
<td>Sleeping</td>
<td>2.71</td>
<td>0.89</td>
<td>0.33</td>
</tr>
<tr>
<td>Social Life</td>
<td>5.64</td>
<td>1.44</td>
<td>0.29</td>
</tr>
<tr>
<td>Traveling</td>
<td>4.36</td>
<td>1.25</td>
<td>0.37</td>
</tr>
<tr>
<td>Vocational</td>
<td>6.53</td>
<td>1.07</td>
<td>0.54</td>
</tr>
<tr>
<td>Anxiety-Mood</td>
<td>3.11</td>
<td>1.70</td>
<td>0.25</td>
</tr>
<tr>
<td>Emotional Control</td>
<td>2.82</td>
<td>2.10</td>
<td>0.42</td>
</tr>
<tr>
<td>Depression</td>
<td>4.60</td>
<td>2.01</td>
<td>0.50</td>
</tr>
<tr>
<td>Interpersonal Relationship</td>
<td>4.71</td>
<td>2.05</td>
<td>0.33</td>
</tr>
<tr>
<td>Social Support</td>
<td>4.07</td>
<td>1.57</td>
<td>0.33</td>
</tr>
<tr>
<td>Punishing Response</td>
<td>3.29</td>
<td>2.33</td>
<td>0.17</td>
</tr>
</tbody>
</table>

$N = 128.$
Figure 1. Mean percentage scores from chronic-normal populations on DPQ categories.
CHAPTER IV

DISCUSSION

The current study was conducted to empirically validate several DPQ psychometric properties. These basic statistical constructs researched through a different computational analysis are as follows: reliability coefficients (hypothesis one), factor internal structure (hypothesis two), concurrent psychological validity (hypothesis three), concurrent functional validity (hypothesis five), and discriminatory differences (hypothesis four). In line with hypothesis one, the data from both clinical and normal populations indicate that test-retest distributions of scores on the DPQ are not the result of "chance" but are due to some "intrinsic characteristics" of the subjects who retained approximately the same score. Consequently, the obtained stability reliability coefficient (.970) suggests that the DPQ is a highly reliable questionnaire which provides raw data with meaning regarding a global measure on different types of activities that affect pain experience response. The value of stability coefficient indicates that the DPQ is a reliable instrument, regardless of misinterpretations that could occur when the ability to respond to a written verbal statement as well as visual
interpretation of the scale was based on the individuals' own responsibility.

The functional and emotional factors reflected on the factor structure matrix, in addition to the positive correlation coefficients between item-score and percentages of the four categories, support the internal structure on the DPQ. The similarity of the DPQ's functional-emotional factor with regard to McGill Pain Questionnaire's sensory-emotional factors provide evidence to suggest construct validity of the DPQ. Theoretical orientation on the DPQ is consistent with the framework of the cognitive-behavioral approach in which pain assessment should consist on different areas such as physical, emotional, cognitive, and behavioral (Turk & Kerns, 1983).

As a global measure of several aspects affecting chronic pain, the DPQ in conjunction with the MMPI (the current most used available criterion on personality assessment) was able to provide empirical evidence with regard to concurrent psychological validity (hypothesis three) and correlational properties of emotional items (anxiety-mood, emotional control, and depression). This, to some extent, reaffirms part of the DPQ's diversity, since a different category such as daily activities was neither significantly correlated with clinical scales of the MMPI nor with psychopathological severity of chronic patients, but it was correlated with physical capacities which clearly indicates that daily-
activities and anxiety-depression have different statistical properties.

Correlational analysis based on data from the working chronic pain category (discharged to work by the Spinal Chronic Pain Clinic) indicate empirical evidence on the DPQ's concurrent functional validity (hypothesis five). The negative significant correlational coefficients suggest either that the working capacities measures (lifting, carrying, sitting, and standing) the lower the percentage on reported pain, or vice-versa. The relevance, by testing different validity constructs, lies on the implication that the DPQ may increase its psychometric value by demonstrating significant validity on different areas. By doing so, the DPQ reassures its clinical and research utility in providing global-complementary information to assess chronic pain.

Interpretation of the present findings should be moderated by recognition of the limitations of the studies. Even though a total of 143 subjects participated in this study, some computational analyses were performed with sample of moderate sizes. Large sample should be tested to improve confidence in the psychometric properties of the instrument. Several limitations of the questionnaire should also be noted. First, the DPQ is a form that is more accurately viewed as a global measure. The functional and emotional factors that emerged in the analysis are suggestive and should be researched further. Second, the DPQ has all
the shortcomings of any self-report measure. That is, it cannot distinguish malingering (especially from blue-collar worker under workmen's compensation) from earnest self-assessment.

Despite its limitations, the DPQ appears to have utility both for clinical and research purposes in a population with chronic back and related pain problems. The DPQ should be used clinically in combination with physical assessment, systematic observation of pain behaviors, physiologic and functional capacities evaluation, and other measures of the pain experience. As part of a multifaceted clinical assessment battery, the DPQ can provide through its four categories (daily-work leisure activities, anxiety-depression, and social interest) important self-report information on levels of activities related to pain, which could be used in developing treatment plans. Because of its psychometric properties and ease of administration, the DPQ also has research utility, especially in the longitudinal research increasingly conducted on patients with chronic pain.
APPENDIX

DALLAS PAIN QUESTIONNAIRE
Dallas Pain Questionnaire

Name ___________________________ Date of Birth _________________________

Today's Date ___________ Occupation ________________________________

Please read: This questionnaire has been designed to give your doctor information as to how your pain has affected your life. Be sure that these are your answers. Do not ask someone else to fill out the questionnaire for you. Please mark an "X" along the line that expresses your thoughts from 0 to 100 in each section.

Section I: Pain and Intensity

To what degree do you rely on pain medications or pain relieving substances for you to be comfortable?

None Some All the time

0% (__________________________:) 100%

Section II: Personal Care

How much does pain interfere with your personal care (getting out of bed, teeth brushing, dressing, etc.)?

None Some I cannot get out of bed

(no pain)

0% (__________________________:) 100%

Section III: Lifting

How much limitation do you notice in lifting?

None Some I cannot lift anything

(I can lift as I did)

0% (__________________________:) 100%
Section IV: Walking

Compared to how far you could walk before your injury or back trouble, how much does pain restrict your walking now?

I can walk the same
Almost the same
Very little
I cannot walk

0% (________:_______:_______:_______:_______) 100%

Section V: Sitting

Back pain limits my sitting in a chair to:

None, pain
Same as before
Some
I cannot sit at all

0% (________:_______:_______:_______:_______) 100%

Section VI: Standing

How much does your pain interfere with your tolerance to stand for long periods?

None
Same as before
Some
I cannot stand

0% (________:_______:_______:_______:_______) 100%

Section VII: Sleeping

How much does pain interfere with your sleeping?

None
Same as before
Some
I cannot sleep at all

0% (________:_______:_______:_______:_______) 100%

D.____ x3 ___%

Section VIII: Social Life

How much does pain interfere with your social life (dancing, games, going out, eating with friends, etc.)?

None
Same as before
Some
No activities total loss

0% (________:_______:_______:_______:_______:_______:_______:_______) 100%
Section IX: Traveling

How much does pain interfere with traveling in a car?

None         Some          I cannot travel
same as before

0% (____:____:____:____:____:____:____:____:____:____) 100%

Section X: Vocational

How much does pain interfere with your job?

None         Some          I cannot work
No interference

0% (____:____:____:____:____:____:____:____:____) 100%

Section XI: Anxiety/Mood

How much control do you feel that you have over demands made on you?

(No Change)
Total
Some         None

100% (____:____:____:____:____:____:____:____) 0%

Section XII: Emotional Control

How much control do you feel you have over your emotions?

(No Change)
Total
Some         None

100% (____:____:____:____:____:____:____:____) 0%

Section XIII: Depression

How depressed have you been since the onset of pain?

Not depressed significantly          Overwhelmed by Depression

0% (____:____:____:____:____:____:____:____) 100%

A____ x5____%
Section XIV: Interpersonal Relationships

How much do you think your pain has changed your relationships with others?

Not Changed

Drastically Changed

0% (____:____:____:____:____:____:____:____) 100%

Section XV: Social Support

How much support do you need from others to help you during this onset of pain (taking over chores, fixing meals, etc.)?

None needed

All the time

0% (____:____:____:____:____:____:____:____) 100%

Section XVI: Punishing Response

How much do you think others express irritation, frustration or anger toward you because of your pain?

None

All the time

0% (____:____:____:____:____:____:____:____) 100%

S____ x5 _____%
REFERENCES


