Psychological Responses to Drought in Northeastern Brazil: An Exploratory Study

by

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A Thesis/Practicum submitted to the Faculty of Graduate Studies of The University of Manitoba in partial fulfillment of the requirements of the degree of Doctor of Philosophy

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Abstract

The study of psychological response and adaptation to drought does not have a lengthy history and little is currently known. This exploratory study in Northeast Brazil, assessed the psychological responses of 102 individuals living in a city (Queimadas) in a drought area compared to the responses of 102 persons living in a drought-free control city (Areia) in the same state and of comparable size. Anxiety and emotional distress levels were measured in individual interviews by the State-Trait Anxiety Inventory (Spielberger, Gorsuch & Lushene, 1970) and the SRQ-20 Questionnaire (Harding et al., 1983) respectively. PTSD incidence was evaluated by the Trauma Sequelae Questionnaire (Koverola, Proulx, Hanna, Battle & Chohan, 1992). Mediating factors (threat perception, coping, and social support) were also assessed. As predicted, the findings revealed that residents in the drought area (Queimadas) had significantly higher levels of anxiety and emotional distress than the no-drought (Areia) residents. Because of role vulnerability, women had significantly higher levels of anxiety and emotional distress than men regardless of the community they lived in. However, women in the drought area had significantly higher levels of anxiety than women in the no-drought area. The infrequent PTSD cases identified were unrelated to the drought. The significantly lower levels of perception of drought as a threat by residents of Queimadas suggested the emergence of a disaster subculture in response to the repetitive and slow onset disaster conditions. Although preliminary, these present findings provided valuable insights and suggestions for future research.

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Psychological Responses to Drought in Northeastern Brazil: An Exploratory Study

Drought has been a recurring phenomenon in the Northeastern region of Brazil. Early reports of the event date back to the 16th century (Universidade Federal do Rio Grande do Norte [UFRN], 1985). Drought is a complex process with climatic events interacting with economic, environmental, political and social factors. Compared to other natural disasters such as earthquakes, hurricanes and floods, the nature and effects of drought are more difficult to evaluate. Its worst effects are pervasive, indirect and long term. As an example of its impact, in the drought-prone Northeastern region of Brazil, nearly 5.5 million people between 1950 and 1980 relocated (United Nations, 1997). Even though not all of this migration was directly due to drought, it was a crucial factor for many in their decision to move. This continues to be a significant problem in Brazil.

The effects of drought on society and on the environment often lasts for years after the drought has ended, and actions taken during non-drought periods may greatly influence the level of individual and community vulnerability to a subsequent drought. Drought is one of several types of natural disasters with psychological consequences. Although the literature on psychological responses to disasters is extensive, the majority of the studies have been conducted with fast-onset disasters and in developed countries. The study of psychological responses to drought is virtually non-existent in developing countries. The present study was designed to assess psychological responses of individuals living in a drought-prone area in Paraíba state, Brazil, compared to

individuals living in a drought-free community in the same state. Prior to the presentation of the theoretical model adopted in the present study, a historical review of disaster research will be presented.

Historical Perspective on Disaster Research

The disaster research tradition originated within two disciplines, sociology and geography, which have dominated disaster research with systematic empirical investigations since the early 1950s (Burton & Kates, 1964; Drabek, 1986, 1989; Oliver-Smith, 1986; Quarantelli, 1985; Quarantelli & Dynes, 1973, 1985). Early sociological research on the disruption of communities and organizations caused by natural disasters supported the view that although there were immediate widespread effects, much of the reaction was superficial, of short duration, and not behaviorally dysfunctional. Sociologists suggested that disasters could even produce beneficial psychological effects by providing a strong sense of individual and social equilibrium (Quarantelli, 1985; Quarantelli & Dynes, 1973, 1985). The relatively unimportant behavioral difficulties resulted not from disaster trauma, but from the social setting in which postdisaster relief and recovery services were obtained.

Within the discipline of psychology, the evolution of disaster research during the last 100 years can be described as a gradual development, with sporadic key events, along with periods of no visible work. Weisaeth (1993) in a concise historical evaluation, reported that the earliest interest in the psychological study of disasters occurred nearly 100 years ago with a study conducted by Edward Stierlin (1909, 1911, cited in Weisaeth, 1993). Although Stierlin was a medical researcher in disaster psychiatry who investigated

both human-made (mining and railway) and natural disasters, his work generally has been overlooked in the disaster literature.

For the first half of the century, studies on mental health and disasters were infrequent and disjointed (Weisaeth, 1993). The first social scientific study of disaster was probably Samuel Prince's doctoral dissertation in Canada. His study addressed the marine accident and explosion in 1917 near Halifax, Nova Scotia (Prince, 1920, cited in Tierney, 1989; Drabek, 1986). In 1944 psychological responses to disasters were systematically assessed by Lindemann (1944) following a fire within the crowded Coconut Grove nightclub in Boston that killed 493 people. Prior to the Coconut Grove study no other study had investigated so inclusively the acute grief processes that survivors experienced after a disaster (Butcher & Dunn, 1989).

The modern era of disaster research in the social sciences in general began in the early 1950s (Tierney, 1989). The focus of early research was on generating comprehensive findings on human behavior in situations of collective stress that could be extrapolated to conditions of war, with special interest on the possibility of nuclear attacks. Disaster psychiatry was strongly influenced by wartime psychiatry (World War II). This can be illustrated by the pioneering studies (Fraser, Leslie, & Phelps, 1942/1943, cited in Weisaeth, 1993) of London bomb survivors. Disaster events were seen as a natural laboratory in which patterns of human response could be examined. It was also influenced by Tyhurst's work (1951) on disaster behavior and the phases of postdisaster responses. Tyhurst reported on the psychological responses of survivors based on field surveys of four disasters that occurred in Canada: Two large fires in apartment-houses, a

marine fire (the S.S. Nordic) and a flash flood. Data were collected across three overlapping phases: (a) period of impact, (b) period of recoil, and (c) posttraumatic period.

In 1950, the first large-scale sociological investigations of community crises were conducted at the National Opinion Research Center (NORC) at the University of Chicago. For the NORC disaster studies, nearly 1,000 persons who had recently been involved in over 70 different major or minor disasters were interviewed. The scope of the disasters ranged from large-scale tornadoes, explosions, and earthquakes to airplane crashes, industrial fires and accidents, building collapses, and train wrecks. The findings indicated that (a) panic flight and other forms of uncontrolled behavior appeared to occur under quite limited conditions; (b) that inadequate warning might lead to more serious loss than no warning at all, and (c) that emotional reactions to disaster might be exacerbated by separation from other family members and by contact with the dead and injured (Fritz & Marks, 1954).

Most of the early research of the 1950s and 1960s suffered from methodological inadequacies (Weisaeth, 1993). Barton (1969), reviewing 103 disaster studies, found that the studies of the Arkansas tornado in 1952, and the Holland flood in 1953, were the ones which best satisfied methodological standards, with the most efficient and useful investigation of community disasters, with appropriate sampling and a wide variety of interview schedules. In recent research, most methodological inadequacies have been rectified, especially from the mid-1970s onward (Weisaeth, 1993).

Research on psychological responses to natural disasters, technological disasters,

and war-related events has grown considerably in the past 20 years, as judged by the increasing amount of relevant literature (Alexander & Wells, 1991; Baum, Fleming, & Singer, 1983; Bromet & Schulberg, 1986; Cairns & Wilson, 1993; Canino, Bravo, Rubio-Stipec, & Woodbury, 1990; Cohen, 1987; Girolamo, 1993; Green, 1982, 1991; Hunter, 1993; McFarlane, 1988a, 1988b, 1988c; Raphael, Lundin, & Weisaeth, 1989; Rubonis & Bickman, 1991; Steinglass & Gerrity, 1990; Wardak, 1993; Weisaeth, 1993; Wilson & Raphael, 1993). Most research has shown that the concept of stress-related psychological responses applies not only to individual loss, traumatic injury, or physical assault, but also to community-wide events such as natural or technological disasters. Recent disaster research has improved with entire populations or representative groups being evaluated with adequate control or comparison groups, with high response rates, with prospective designs together with long observation periods, and with more adequate assessment methods such as structured interviews and standardized rating instruments. The following studies are just a few examples of this better quality recent disaster research.

Gleser, Green, and Winget (1978) evaluated the extent of psychological impairment of some of the adult survivors in Buffalo Creek, West Virginia, after a dam collapse which killed 125 people, injured over 1,000, and destroyed most of 16 coal mining communities. The Psychiatric Evaluation Form (PEP) which covers 19 dimensions of manifest psychopathology rated on a scale from 1 (none) to 6 (extreme) was used to evaluate the survivors. The results showed that the adult survivors of the Buffalo Creek disaster continued to suffer from symptoms of anxiety, depression and hostility-belligerence with social isolation, disruption of daily routine, and somatic

concerns over two years after the disaster.

Fairley, Langeluddecke and Tennant (1986) conducted a study in Viti Levu, the main island of Fiji, that was hit by cyclone Oscar on March 1, 1983. Data were collected from Nabila (cyclone village) and Waiyavi (control settlement). Both settlements had similar racial and sociodemographic characteristics. The instruments used were (a) a demographic and social questionnaire; (b) the 28-item General Health Questionnaire (GHQ); (c) a somatic symptom inventory; and (d) a post-traumatic stress questionnaire. Data were collected in the cyclone village on two separate occasions. Half of the sample was interviewed 8-9 weeks after the cyclone and, the other half 12-13 weeks after the cyclone. Data on the control settlement were collected between the two phases of the Nabila interviews. Results showed that brief, catastrophic stress without loss of life appeared to provoke psychological and physical morbidity of relatively brief duration.

Shore, Tatum, and Vollmer (1986a, 1986b) studied the psychiatric reactions of survivors in Castle Rock, Washington and the adjoining Toutle River Valley, and of residents in a nearby control community, Estacada, Oregon and the surrounding Eagle Creek neighbourhood following the Mount St. Helens, Washington, volcanic eruption. The mental health status of survivors and a control group was evaluated with the Diagnostic Interview Schedule and four subscales of the Symptom Checklist-90. The results showed the occurrence of depression, generalized anxiety, and post-traumatic stress reaction among the survivors.

Bravo, Rubio-Stipec, Canino, Woodbury, and Ribera (1990) investigated the psychological sequelae in the adult population of the Caribbean island of Puerto Rico

after torrential rains produced widespread flooding and mud slides. There were nearly 180 deaths, 4,000 persons had to be lodged in public shelters for several months and 19,000 suffered extensive material losses. Because a year earlier an island-wide mental health survey was conducted, it was possible to evaluate 375 survivors prospectively and retrospectively. The instrument used in this study was a Spanish version of the Diagnostic Interview Schedule/Disaster Supplement. Results showed a small increase in depressive, somatic, and post-traumatic stress symptoms after disaster exposure, thus suggesting that disaster survivors were rather resilient to the development of new psychological symptoms.

Theoretical Framework

Although substantial clinical and research literature has focused explicitly on the mental health consequences of community-wide disasters (Baum et al., 1983; Bravo et al., 1990; Canino et al., 1990; Shore et al., 1986a, 1986b; Steinglass & Gerrity, 1990), there is a lack of consensus regarding the specific nature, degree, and persistence of mental health symptoms. Contradictory findings following major disasters have inspired debates concerning research design, assessment measures, data explanation, and disaster definition (Gibbs, 1989; Green, 1985, 1991; Vitaliano, Maiuro, Bolton, & Armsden, 1987; Warheit, 1985).

Several authors have reviewed the characteristics of disaster that seem most likely to induce psychopathology (Baum & Davidson, 1986; Bolin, 1986; Gibbs, 1989; Green, 1990, 1993, Vitaliano et al., 1987). The issue of social resources has received extensive attention in the psychological literature (Solomon, 1986). Less attention has been given to

the within-individual variables of vulnerability and psychological resources (Gibbs, 1989). Recently, researchers have increasily attended to coping styles and individual resources.

Individual responses to the same natural disaster may vary. Despite commonalities, no two individuals or natural disasters are exactly the same. To understand psychological responses to natural disaster, it is critical to consider the individuals, their resources and their environment (Ursano, Fullerton & McCaughey, 1994). The proposed theoretical framework (Figure 1) illustrates the relationship between the traumatic event (i.e., disaster), mediating factors (e.g. individual factors) and psychological responses (e.g., anxiety).

Traumatic Event

Understanding psychological responses to disasters must begin with a definition of the term disaster (Alexander, 1997; Baum, 1987; Bolin, 1986, 1989; Oliver-Smith, 1986; Solomon, 1989; Tierney, 1989; Warheit, 1985). This term has been used differently by the general public, researchers, and practitioners. Lack of agreement on events to include within disaster terminology is one of the causes of ongoing controversies on how disasters influence mental health (Berren, Santiago, Beigel, & Timmons, 1989; Tierney, 1989; Warheit, 1985).

Disasters are complex, multidimensional phenomena that take a heavy toll in terms of death, suffering, and economic loss. Korver (1987, cited in Weisaeth, 1993) found more than 40 scientific definitions of disaster, reflecting the varied approaches within the disciplines dealing with disasters, such as medicine, psychology, sociology,

TRAUMATIC EVENT

MEDIATING FACTORS

STRESSOR	INDIVIDUAL	ENVIRONMENTAL/ RECOVERY
Nature	Perceived threat/loss	Resources
Severity	Psychological Resources	Social Support
	Socio-economic status	Experience
	Gender	

PSYCHOLOGICAL RESPONSES

Anxiety
Emotional Distress
Posttraumatic Stress Disorder - PTSD

Source: After Ursano, Fullerton & McCaughey, 1994

Figure 1. Theoretical Framework

political science, ecology, engineering and economics. Most definitions stress the severe destruction that exceeds the coping capacity of the affected community (Weisaeth, 1993; World Health Organization [WHO], 1992). Disasters and their causes and consequences are also related to social structures and processes (Tierney, 1989). The social disruption that follows disasters is closely related to economic factors and predisaster policies. Human behavior and social processes affect and are affected by every stage of the disaster, from the predisaster period to the impact and recovery stages (Kreps, 1984; Tierney, 1989). Thus, the adjustment capacity, and the psychological, social and physical resources of a community, are primary considerations defining when a destructive event leads to disaster. For example, earthquakes of similar magnitudes are not equally destructive and disruptive in all parts of the world. Some societies have developed technology to mitigate the earthquake hazard, constructing buildings that are more resistant, and developing more effective emergency response plans (Tierney, 1989).

Some definitions limit disasters to events that are "concentrated in time and space" (Fritz, 1961, cited in Berren et al., 1989, p. 43) or that occur "suddenly, unexpectedly, and uncontrollably" (McCaughey, 1984, cited in Berren et al., 1989, p. 43). By contrast, international agencies, among others, view disaster "as a severe disruption, ecological and psychological, which greatly exceeds the coping capacity of the affected community" (WHO, 1992, p. 2). Comparing the definitions, events such as famine, drought, chemical and nuclear accidents, social conflicts, and epidemics, would be classified as disasters by the latter but not by the former definition. Even though events may have a disastrous outcome over a long term, they would not be considered disasters

according to the former definitions because their occurrence is not abrupt, and not concentrated in time and space.

Economical, emotional and political implications may arise based on the disaster's definition. In some cases, the denial, for political reasons, of the severity of an earthquake, cyclone, famine, or drought not only impede international disaster relief, but also may lead to little or no domestic response (Quarantelli, 1986). Weisaeth (1993) discussed the characteristics that help to define disaster's consequences. First, reporting an event as a "disaster" may bias, among other factors, the amount of help offered. If an event is classified as a disaster, it will probably draw more attention from relief agencies. Second, the disaster concept has political and emotional values that might influence the survivors and the public in general. Third, the extent of a disaster, in contrast to other severe and traumatic events (e.g., a single fatal car accident), creates demands that may outrun the existing resources in the community.

There have been attempts to provide an acceptable taxonomy for disasters. The system proposed by Berren et al. (1989), which is currently widely used, will be adopted for the present study. His model is based on five different criteria used to classify disasters: (1) type of disaster (natural vs. human induced), (2) low-point vs. no-low-point, (3) scope of the disaster, (4) size of the disaster, and (5) degree of personal impact.

Type of Disaster

Natural disasters. Natural disasters are grouped under a category of environmental events, involving natural forces, "that periodically, and with varying degrees of intensity and, warning period, subject human systems to a wide range of disruptions and stress"

(Bolin, 1989, p.61). Natural disasters include events that give little warning such as earthquakes, landslides, and volcanoes, whereas weather disasters, including hurricanes, cyclones, typhoons, blizzards, and so on, usually are slower-onset and give more warning than those related to movements of the earth (Baum, 1987; Berren et al., 1989; Bolin, 1989; Weisaeth, 1993). Long-term natural disasters that are strongly influenced by climate patterns comprise another group which include events such as drought.

The occurrence of natural disasters have varied little through the last hundred years. What has changed is the capacity of society to adjust to these natural events. In developed countries, early warning detection and pre- and postdisaster emergency response policies have greatly decreased the number of fatalities and the amount of property damage, while increasing the chances that survivors will successfully recover and revitalize their communities (Kroll-Smith & Couch, 1993). In spite of this, catastrophic impact and loss of life have increased because of population growth. A demographic increase and urbanization have resulted in "mega-cities" that are highly vulnerable to disasters (Alexander, 1997). Developing countries have been particularly affected by this trend. When disasters strike in these countries, because of both the devastating physical and psychological impact, and the scarcity of resources to deal with the event, the consequences maybe overwhelming (Alamo, 1995; Alexander, 1997; Girolamo, 1993; Lechat, 1990; Lima, Pai, Santacruz, & Lozano, 1991; Oliver-Smith, 1986).

Human-induced disasters. Human-induced disasters can be classified as either: (a) acts of omission or (b) acts of commission. Acts of omission are usually related to

negligence. "These disasters result not necessarily because of malevolent intent, but rather because of poor planning or attempts to save money, resources, or time" (Berren et al., 1989, p. 49). Chemical and nuclear accidents are examples of acts of omission. The frequency of these disasters is likely to increase in the future because of the increase and development of new technologies to improve life quality also create waste disposal systems that are susceptible to malfunction. Disasters that result from acts of commission include terrorism, mass kidnaping, and other purposeful violence (Berren et al., 1989).

Frederick (1980) observed that survivors of human-induced disasters experience psychological symptoms, emotional stages, and social processes different from those accompanying natural disasters (For a review see Baum, 1987; Berren et al., 1989). Human-induced disasters seem to provoke greater psychological distress than natural disasters, and their consequences seems to be longer lasting. The reason for this is based on the concept of perceived control. In a natural disaster, survivors are perceived as not having any control over what happened. On the other hand, survivors of human-induced disasters might be perceived as having some degree of control (Baum et al., 1983; Berren et al., 1989; Weisaeth, 1993). A second reason is the opportunity for blame. When failure of technological systems occurs, agencies that are responsible for the care of such systems are targeted for blame (Baum, 1987).

Low-point vs. no-low-point disasters. Low-point disasters are those which have a specific time frame for their occurrence, such as a volcano eruption or a hurricane. Another possibility is to define the low-point as when the worst is over (Baum, 1987). By contrast, the no-low-point disaster such as a belatedly discovered nuclear accident or

chemical spill does not have a specific time frame, and in the research literature is called "disaster without a footprint" (Berren et al., 1989, p. 52). The event has happened but the consequences will be known only over a long time frame. No-low-point disasters have different psychosocial implications. Bolin (1989) suggested that many technological disasters (e.g., toxic waste dump site leaks) have no obvious immediate physical impact and no clearly identifiable low point. Consequently, the long term unknown effects of the disaster lead to more stress on the survivors.

Scope of the disaster. Some disasters, whether classified as human-induced or natural, and whether or not they have a low point, are localized, in that they impact the residents of a geographically limited area (Berren et al., 1989). In contrast, disasters caused by an event such as an airplane crash, affect a group of people that might not be geographically connected and the community environment remains intact. These are called dispersed disasters (Berren et al., 1989).

Size of the disaster. The size of the disaster is related to the capacity of the various support systems (e.g., health care, social welfare, housing) to respond adequately to the survivors' needs as well as to the magnitude of the disaster itself and the survivors' psychological responses (Berren et al., 1989). In the aftermath of disasters, survivors sometimes compete for limited resources, and the response to the disaster is dependent upon the size of the community and the availability of community resources (Warheit, 1985).

Degree of personal impact. Disasters may differ also in extent and type of its personal impact. Personal impact is the extent to which disaster affects the individual,

regardless of the size or scope of the disaster. The impact on each individual is not necessarily perfectly related to the type or size of a disaster (Berren et al., 1989; Myers, 1989). An important factor to consider is the phenomenology of the survivor and, its contribution to the psychological response.

Mediating Factors

Psychological responses to disasters should be viewed as a process mediated by factors related to the disaster itself, to the social network and to the individual's characteristics (Green, 1991; Myers, 1989). Mediating factors could help explain the varied psychological responses to disasters. Green, Wilson and Lindy (1985) have described some mediating factors such as stressors and individual characteristics, and environmental/recovery aspects that could contribute to the development or recovery from stress response syndromes. To better understand psychological responses to disasters (e.g., anxiety), each of these mediating factors need to be taken into account.

Stressor Factors

Green (1990, 1993) has identified eight stressor factors: violent loss, life threat, exposure to grotesque death, receipt of intentional harm, injury, witnessing violence, exposure to noxious agents, and being responsible for the death of another person. She suggested that these factors could be used to define a traumatic event. The suggested factors are centered at the individual level. This approach assumes that the individual's experience with the event plays an important part in how the event is processed, even when it is a collective event, such as a disaster. Assessment of these factors would yield more consistent data on the events that put individuals most at risk for short- and long-

term psychological problems or symptoms. Such information would be helpful in planning therapeutic services for survivors, because the presence of these factors might increase the risk for stress response syndromes such as PTSD (Green, 1990, 1993). It would also allow for more precise research on the role played by these specific experiences relative to other factors that may determine the overall outcome (e.g., prior psychological status, social support).

Individual Factors

Several individual factors have been identified as important in defining the psychological outcome to a disaster: perceived threat or loss, psychological resources, socio-economic status, and gender (Gibbs, 1989; Green, 1991; Myers, 1989; Warheit, 1985).

Perceived threat or loss. The meaning of any event is a complex interaction of the event and the individual's past, present, and expected future as well as the social context (Ursano, Kao, & Fullerton, 1992). The meaning of the event for the survivors determines not only how the situation is experienced initially, but also the way in which recovery occurs and life is reestablished. Consequently, the meaning of the context is not only in the situation itself, nor in the individuals, but in the interaction between individuals and the event (Appley & Trumbull, 1986, Silva, 1993). According to Appley and Trumbull (1986) the context in which an event occurs is "defined only in part by real time and geographic space"(p. 313). Although this information helps to determine the characteristics of a certain event or process, the meaning of the event originates largely from more indirect aspects of the environment in which the event takes place, such as

how the community is facing the event. Lazarus (1966) has pointed out the importance of using the survivor's perception of threat as a variable in stress research, and has demonstrated the increased predictability of psychopathology produced by using perception measures. Foa, Steketee, and Rothbaum (1989) have emphasized how behavioral approaches need to take into account the importance of the perceived threat, which is a better predictor of stress syndromes than the actual danger.

Psychological resources. Warheit (1985) suggests that stress levels are increased for some individuals. These individuals include those who have previous risk factors (physical and/or psychological), are socially isolated, and/or lack a sense of cultural or social integration because of structural and/or emotional isolation. In addition, individuals who perceive themselves as lacking personal, interpersonal, social, or material resources, and realize that they have lost these resources as a result of the event, will be more at risk of severe levels of stress (Myers, 1989; Warheit, 1985). It is also important to know whether the person has suffered prior trauma. Multiple trauma events may put individuals at higher risk for developing stress syndromes (Kramer & Green, 1991).

Socio-economic status. Kessler (1979) reported that individuals in socially disadvantaged status are particularly likely to exhibit symptoms of psychological distress. This is one of the most consistently documented associations in psychiatric epidemiology (Gibbs, 1980; Kessler, Price, & Wortman, 1985; McLeod & Kessler, 1990). Early research focused on the hypothesis that greater exposure to stressful life events accounts for the high rates of distress among lower status groups, however, recent empirical research has failed to support this hypothesis (McLeod & Kessler, 1990). Researchers

have turned to the study of differential vulnerability: Members of lower status are disadvantaged not only in their probability of experiencing events, but also in the resources they have to cope with these events. Although there is empirical evidence for the relationship between lower status and vulnerability (Brown & Harris, 1978 cited in McLeod & Kessler, 1990; Kessler, 1979), little is known about the specific nature of the vulnerability.

Wheaton (1982) found that socially disadvantaged groups were, in general, more vulnerable to the effects of life events stressors. However, he also found that disadvantaged groups were less likely to develop extreme distress responses in the face of stress. Wheaton (1982) proposes an analogy: "the immunity to the effects of certain biological disease agents may be greater in populations which are exposed to such agents at a higher rate" (p. 308).

Higher socio-economic status, usually measured by education and income, is a good predictor of better mental health (For a review, see Gibbs, 1980). It could be expected that higher socio-economic status individuals would also have more resources and better coping skills for dealing with disaster (Gibbs, 1989). Even though some studies have not found a relationship between education and income and post-disaster symptomatology (Leopold & Dillon, 1963), others have found higher education and income to correlate with fewer psychological effects of the disaster (Gibbs, 1989). Bolin and Bolton (1986) reported that financial stresses associated with the recovery process were most pronounced for those survivors who were already financially disadvantaged.

Gender. Contemporary disaster research has been characterized by

generalizations, ignoring in most cases reference to gender. Women's issues in the context of disasters have only recently been dealt with. Many studies suggested that women are more seriously affected by disasters than men (Gibbs, 1989). On the other hand, some disaster studies that included a broader range of disorders do not find higher overall rates of disorder for women (Gibbs, 1989). In a study with the survivors of the Mount St. Helens volcano eruption, Shore et al. (1986b) found three disorders to be significantly associated with disaster stress in the general population: generalized anxiety, major depression, and PTSD. Women demonstrated elevated onset levels for all three disorders, while men only evidenced elevated levels of generalized anxiety disorder. Shore et al. (1986a) also reported that for those persons with generalized anxiety or depression prior to the eruption, symptoms recurrence rates post-disaster for one or more of the psychological disorders (generalized anxiety, major depression and PTSD) were significantly higher for women but not for men exposed to the disaster. In another study, within a sample of survivors of Mt. St. Helens volcanic eruption, Cowan & Murphy (1985) found that the female gender predicted more depression and somatization, while males predicted more symptoms of physical illness. Gleser, Green, and Winget (1981, cited in Gibbs, 1989) found that among Buffalo Creek flood victims, females showed more anxiety and depression than did males, but that males showed more alcohol abuse and belligerence.

In the context of natural disasters in developing countries, gender issues play a fundamental role. In less-developed societies, the responsibility of coping with disasters falls disproportionately on women (Alexander, 1991; Rivers, 1982). Women's lives are

already stressful even before the disaster event. There is a tradition that women should produce new workers by bearing children. In addition, at the end of each day, women should care for the present workers - their husbands, sons, and, since the twentieth century, their daughters. This pattern of labor distribution produces a severe power imbalance in the private domain (Lipman-Blumen, 1984). Women are responsible for the security of the domestic group. Even though women may be disproportionately represented among disaster stricken populations in developing countries (Wiest, Mocellin, and Motsisi,1994), research regarding their psychological responses to disasters is virtually non-existent.

Environmental/Recovery Factors

Some community factors may increase stress levels after a disaster (Warheit, 1985). Stress levels may increase when the community has had no previous experience with the event or when the community social organization has been disrupted. Disaster events which survivors are unfamiliar with are more likely to be psychologically disturbing. Previous experience, individually or collectively, may create "disaster subcultures" that mitigate against the stress effects of natural disaster agents (Bolin, 1989; Mileti, Drabek, & Haas, 1975; Norris & Murrell, 1988). Disaster subculture "...would include those adjustments, actual and potential, social, psychological and physical, which are used by residents of such areas in their efforts to cope with disasters which have struck or which tradition indicates may strike in the future" (Moore, 1964, p. 195). Hannigan and Kueneman (1978) elaborated the concept and included cultural elements such as norms, values, beliefs, which could influence the specific disaster subculture.

Stress levels has the potential to increase when the event creates or exposes latent conflicts in the community and/or in its social, political, ethnic, and economic groups (Tierney, 1989). If authorities in charge of disaster management provide ambiguous and conflicting information regarding the event, stress levels may increase. When the community lacks resources and is unable to alleviate the disruptive effects of the disaster in a short time, these factors also contribute to increase in stress levels (Raphael & Wilson, 1993).

Social disruptions that arise in the immediate postdisaster period are likely associated with recovery efforts (e.g., relocation of the survivors) (Green, 1993). These events are conceptualized as environment-recovery factors rather than as part of the event itself. Another aspect of the recovery environment is personal social supports (Green, 1993). Perceptions of social support during traumatic events influence their outcome. Individuals might be more vulnerable if they perceived their social networks as deficient or not helpful, or if they lacked a personal confidant (Raphael and Wilson, 1993).

Psychological Responses

Researchers disagree on the extent of the psychological impairment following disasters. Some believe it is transient, a normal response to an abnormal event (Ursano et al., 1992; Ursano et al., 1994). Some researchers support the assumption that disasters cause extensive psychological distress and social disruption, in addition to promoting chronic psychological trauma (Erickson, 1976; Menninger, 1952; Titchener & Kapp, 1976). Other researchers describe disasters as causing only short term psychological stress and very few chronic psychological or psychiatric disorders (Drabek & Stephenson,

1971; Fritz & Marks, 1954). Still other researchers suggest that disasters might lead to psychiatric illness, behavioral change, or alteration in physical health, but only among those who had previous histories of psychopathology or psychological vulnerability (McFarlane, 1989, 1991, 1993; Weisaeth, 1993; Ursano et al., 1992; Ursano et al., 1994).

There are, at least, three possible explanations for this lack of consensus regarding psychological responses. First, researchers have used different psychological measures. Second, the time frame for data collection has been different across disaster studies. Finally, as already discussed, the concept of disaster has varied interpretations (Vitaliano et al., 1987; Warheit, 1985).

Horowitz, Stinton, and Field (1991) suggest that psychological responses to natural disasters have always been difficult to study because of the tendency to see responses as entirely due to the disaster. A natural disaster is rarely an isolated event. Usually, the disaster itself is just the beginning of a series of events with serious consequences. Green (1982) reports that it is difficult to predict the relationship between traumatic stress, psychological response and recovery process. This prediction is complicated by differences in the nature of the disaster and severity of stressors (Baum, 1987; Bromet & Schulberg, 1986; Ursano, 1987), and the lack of data on the relationship between acute responses to trauma and long-term health outcomes (Baum, 1987). The effects of traumatic stressors are mediated by a number of variables including social support, premorbid personality, individual developmental history, and the multiple meanings attributed to the disaster by individuals and communities (Ursano & Fullerton, 1990).

During the aftermath of a natural disaster, the affected population goes through a sequence of distinct psychological responses (McFarlane, 1993). These responses range from (a) a variety of normal stress response syndromes followed by resilient recovery, to (b) several types of enduring psychopathology that may interfere with life functions for a prolonged period of time (Horowitz et al., 1991; McFarlane, 1993). Stress response syndromes are judged to be located midrange between normal adaptive responses to natural disasters and more severe forms of psychopathology that are exacerbated by exposure to a disaster (Horowitz et al., 1991; McFarlane, 1993).

Lyons (1991) suggested that survivors who display resilience rather than pathology following trauma are frequently overlooked. Healthy responses to terrible life events has only recently become a focus of studies even though they have been referred to anecdotally in many reports (e.g., Bettelheim, 1945, Frankl, 1978). Joseph, Williams and Yule (1993) proposed that disaster research is limited by its focus on maladaptive responses. In their preliminary study they evaluated 35 adult survivors of a ship disaster. According to the authors, there was a large number of survivors endorsing positive response items, such as they value their relationships more, value other people more, and feel more experienced among others. These findings raise the question if survivors from other disasters would show similar positive responses.

Slow- vs. Fast-onset Disasters

Most studies evaluating psychological responses to disasters have focused on pathological outcome in response to sudden and catastrophic events in developed countries (Joseph et al., 1993). There are few studies of psychological responses related to

slow-onset disasters such as drought. In such events, the environment may not be visibly altered, and the stressful aspects not restricted to the event itself. These may continue for a long period, or even indefinitely, and contain many subsequent added disruptions requiring further adjustment of individuals. Among the few studies on drought and psychological responses, there was one conducted in Africa (Redd Barna, 1987) and psychological responses were just a small component of the overall approach. One of the very few studies conducted in Brazil on drought, employed sociological models to evaluate a theory of family stress in the context of drought (Greenstein, 1981).

Slow-onset disasters tend to recur in specific areas, thus giving individuals in these locals the opportunity to overtime develop a coping response to the disaster (Weisaeth, 1993). Among some populations, especially in developing countries, the lengthy experience of coping with natural disasters may contribute to the development of what sociologists have called "disaster subcultures", that will influence the pattern of psychological reactions to the disaster event. Such learned response to disasters should be considered carefully in evaluating psychological responses from a cross-cultural perspective (Girolamo, 1993). Moreover, these slow-onset events, in the long run, may be more resistant to intervention strategies than are the more sudden and catastrophic events (Baum, 1987). There have been very few studies on the development of "disaster subcultures". This is probably due to most studies being conducted on fast-onset disasters.

PTSD and fast-onset disasters. For individuals involved in fast-onset disasters, such as volcanic eruptions or earthquakes, PTSD is the most frequent diagnosis among

those who have more severe forms of psychopathology (Girolamo, 1993; Horowitz, et al., 1991; McFarlane, 1993). Distress, anxiety, depressive states, phobic disorders, pathological grief, and reactive psychoses may also be included in this pattern.

Recent disaster research has been assisted by the introduction of the diagnostic criteria for post-traumatic stress disorder-PTSD in the DSM-III (American Psychiatric Association [APA], 1980). These criteria provide a more reliable tool for assessing this mental disorder associated with sudden onset, traumatic events. Concurrently with this evolution in disaster psychiatry and clinical psychology, multidisciplinary efforts have been made to develop a theoretical framework to evaluate the psychological responses following a disaster (Vitaliano, et al., 1987, Warheit, 1986).

PTSD has been defined by: (a) the experience of an event outside the range of usual human experience; (b) experiences that in some way repeat the traumatic event; (c) constant avoidance of related stimuli or symptoms of denial states, for instance, numbness or unresponsiveness; and (d) persistent symptoms of increased arousal (APA, 1994; Horowitz, 1993; Joseph, Yule, & Williams, 1993).

In 1980, PTSD became an official diagnosis (APA, 1980) and, with its use, findings from different disasters began to converge. Although recognition of the diagnosis was influenced strongly by clinical attention to the problems of returning Vietnam war veterans, responses to other types of traumatic events can also be found in the literature (e.g., "rape trauma syndrome," Burgess & Holmstrom, 1974, cited in Green, 1991; "survivor syndrome," Lifton, 1967, cited in Green, 1991). Characteristic reactions to these varied traumatic events were found to be similar. The identification of posttraumatic

diagnoses had the effect of moving research from distinct areas onto converging paths (Green, 1991).

The incidence of PTSD within slow-onset disaster is likely to be low and, if present at all, related to incidents other than the disaster. Usually, PTSD occurrence has been identified among survivors of fast-onset disasters, involved in situations of terror or horror during the traumatic event. It is also important not to overemphasize PTSD as the only possible psychological response resulting from exposure to stressful events.

Study Conceptualization

Studies of psychological responses to natural disasters suggest that early evaluation of the response of the disaster-affected population should be a major priority (McFarlane, 1993). The need for intervention strategies aimed at preventing and treating stress-responses syndromes following natural disasters is greatest in developing countries and among socioeconomically deprived individuals (Bravo et al., 1990; Canino et al., 1990; Girolamo, 1993). However, most studies on psychological responses after natural fast-onset disasters have been conducted in developed countries (Bromet & Schulberg, 1986; Cowan & Murphy, 1985; Kaniasty & Norris, 1993; Madakasira & O'Brien, 1987; McFarlane & Hua, 1993; McFarlane & Papay, 1992; Odaira, Iwadate, & Raphael, 1993; Shore, Vollmer, & Tatum, 1989; Solomon, Bravo, Rubio-Stipec, & Canino, 1993). There have been few exceptions, such as studies of reactions to the earthquakes in Peru and Nicaragua (Cohen, 1976, cited in Silva, 1993; Janney, Masuda, & Holmes, 1977, cited in Silva, 1993), the earthquakes in Ecuador (Lima, Chaves et al., 1989) and the volcanic eruption in Armero, Colombia (Lima et al., 1991; Lima, Pai, Santacruz, Lozano, & Luna,

1987). McFarlane (1993) observed that most disaster and traumatic stress research has examined events that affected relatively small groups. In contrast, disasters in developing countries typically impact on hundreds of thousands of survivors. The extent to which the results of research conducted in developed countries can be applied to these more devastating situations is an important theoretical and humanitarian issue.

Statement of the Problem

Sample of Interest

The present research is somewhat exploratory in nature. First, it will investigate a less-studied event (drought), which is classified as a slow-onset natural disaster. Drought is defined as "essentially a temporary shortfall of water supply below demand caused by behaviour of natural atmospheric and hydrologic processes, and which has significant social and economic repercussions" (Chapman, 1994, p. 121). Although floods are the most frequent natural hazard world-wide, greater numbers of individuals are extensively affected and disrupted by droughts. It has been estimated that, during the 1970s, an average of approximately 25 million people were negatively affected by drought (Smith, 1992). Smith refers to drought as a "creeping hazard" (Smith, 1992, p. 246), because it evolves slowly, sometimes over a period of months, and has an extended duration. Different from other hazards, droughts are not restricted to a specific topographic setting and their consequences might be over many thousands of square kilometers. Over-grazing, poor cropping methods, deforestation and improper soil conservation techniques may increase drought-related disasters. According to Smith (1992) in the developed countries "no one dies of drought today" (p. 246). In many developing countries the

disastrous effect of drought on an already unstable food supply often leads to death from famine.

The United Nations (1997) reported that compared to other natural disasters, drought "tends to drive people apart rather than bring them together". During drought periods, confrontations between individuals, communities and governments competing for water resources are typical. Usually poor social conditions or unstable political circumstances are aggravated during drought. Drought impacts upon public safety, health, conflict between individuals, decreased quality of life and discrimination in the allocation of disaster relief. A major consequence of drought is population migration. Typically individuals migrate from rural to urban areas outside the drought area. However, when drought diminishes, these individuals rarely return home, "depriving rural areas of valuable human resources necessary for economic development" (United Nations, 1997).

Drought is common to large parts of the Northeastern region of Brazil (Hastenrath & Heller, 1977; Smith, 1992), where this research was conducted. The region is divided into nine states: Bahia, Sergipe, Alagoas, Pernambuco, Paraíba, Rio Grande do Norte, Ceará, Piauí and Maranhão. These states cover more than 18% of the country's land area and contain 43 million inhabitants, nearly 30% of Brazil's population. Periodic and even chronic droughts are extensive in some geographical areas. The drought-prone region is generally described as covering large portions of the states of Ceará, Rio Grande do Norte, Paraíba, Pernambuco, Alagoas, and Sergipe, about one-tenth of the state of Piauí, and a portion of the state of Bahia.

Psychological Responses

This was the first study to be conducted on psychological responses to drought in Brazil. How the individuals' psychological responses differ from the well-studied fast-onset disasters such as bushfires, volcanic eruption and earthquakes was examined.

There is a variety of psychological responses to disasters. In the past, the selection of measurement instruments to assess the individuals' psychological responses in disaster studies was problematic, since most of the previous disaster researchers had devised a new questionnaire for each study. Baum et al. (1993) suggested that, the use of "homemade" measures should be abandoned in favour of standardized measures. Additionally, Raphael et al. (1989) emphasized the need for using core measures and comparable methods so that studies on different types of disasters in different countries could have some basis for comparison.

This study attempted to provide that linkage with prior research by selecting measures of anxiety, emotional distress and PTSD that have been used in previous disaster studies. Although anxiety and emotional distress are overlapping constructs, they were evaluated separately to permit comparison with previous research. The measures for anxiety have been used in developed countries and the measure for emotional distress in developing countries. In this study survivors' anxiety levels were measured by the State-Trait Anxiety Inventory - STAI (Spielberger, Gorsuch, & Lushene, 1970). This scale has been used in several disaster studies. In a study conducted by Norris and Murrell (1988), 234 older adults (aged 55+yrs) who were involved in a serious flooding incident in southeastern Kentucky were evaluated. The participants were interviewed before and after

the flooding. Floods are not uncommon in this area, but these were more widespread than most, and resulted in both previously exposed and newly exposed subsamples of disaster victims. Flood impact was measured at both personal and community levels. With preflood symptoms controlled, there were modest effects on both trait anxiety (State-Trait Anxiety Inventory-STAI) and specific distress measure for participants without prior flood experience, but no flood effects on these measures for participants who had been in floods before. These results emphasized the advantage of being familiar or experienced with a stressor.

De Man, Simpson-Housley and Curtis (1984) investigated the relationship between perceptions of potential nuclear disaster and state and trait anxiety. Interviews were conducted with 89 residents of an area located near a designated nuclear site. The residents were interviewed at home about personal experience with nuclear accidents, expectations of future accidents, and anticipated damage. They also completed the State-Trait Anxiety Inventory (STAI). No significant correlation was found between trait anxiety and expectations of future accidents or between this measure of anxiety and estimation of potential damage. Expectation of an accident and estimation of damage were significantly related to state anxiety. According to the authors, their results supported the suggestion that once a situation is appraised as threatening, a state anxiety reaction would be evoked.

Mehta and Simpson-Housley (1994) investigated how trait anxiety interacts with demographic variables in influencing assessment of nuclear power disaster potential. Participants, 77 women and 73 men, who lived near a nuclear power plant completed

survey instruments, including the Trait Anxiety subscale of the State-Trait Anxiety Inventory (STAI). Expectation of a future nuclear power plant disaster was positively related to high trait-anxiety elevations in women who were childless.

Emotional distress was assessed in the present study by the Self-Reporting Questionnaire (SRQ-20) (Harding et al., 1980; Harding t al., 1983; WHO, 1994). This questionnaire was designed to assess emotional distress in developing countries. The classical series of longitudinal studies conducted in Colombia and Ecuador, by Bruno Lima and his associates (e.g., Lima et al., 1987) appear to be the most significant work produced so far, on natural disasters in Latin America using the SRQ-20. Lima et al., (1991) evaluated 102 adult survivors of low socioeconomic status, living in tent camps eight months after the volcanic eruption that occurred in Armero, Colombia. The objective of the study was to determine the level of psychiatric morbidity. Ninety-one percent of the subjects were identified by the screening instrument (SRQ-20) as being emotionally distressed. Additionally, they met criteria for a psychiatric disorder in the Diagnostic and Statistical Manual of Mental Disorders (DSM)-III (APA, 1980). Although some emotional distress may have been generated by temporary living conditions, the authors attributed elevated levels to the more precipitous traumatic effects of the disaster itself.

Since the introduction of the diagnostic category of PTSD (APA, 1980, 1994), the focus of studies on the psychological effects of disaster has been on pathological outcomes, commonly associated with traumatic fast-onset disaster. To compare the incidence of PTSD in a slow-onset disaster context, the Trauma Sequelae Questionnaire

(Koverola, Proulx, Hanna, Battle, & Chohan, 1992) was used.

This study also explored the relationship between psychological responses and gender. The incorporation of gender perspectives in the study of psychological responses to drought would provide a better understanding of how men and women are differentially affected by the drought. At the household level in many countries, women are primarily responsible for supplying food and the overall subsistence strategy of the family. The consequences of drought significantly undermine women's efforts to attend to their families. The burden which women face, both as members of a community in crisis and as women within a family unit, should be acknowledged and studied (Walker, 1994).

Mediating factors have been identified as important variables in understanding individual differences in psychological responses. This study assessed the levels of threat perception, coping, and social support within the drought context. Furthermore, demographic variables such as age, working situation, income, and educational levels were also evaluated regarding their influence on psychological responses.

Specific Hypotheses

Although this research is exploratory, several predictions were tested based on prior research. Previous studies have shown that there would be psychological impairment (e.g., anxiety) for individuals facing a disaster. Considering this research, *it was hypothesized that individuals living in a drought area will have higher levels of anxiety (State & Trait) and emotional distress than individuals living in a no-drought area.*

In assessing the trauma potential of disaster agents, consideration should be given

to the vulnerability of different demographic groups to disaster-induced psychological responses. Therefore, the second hypothesis to be tested was that *within a drought area women will have higher levels of anxiety (State & Trait) and emotional distress than men.* Gender perspectives in responses to disasters remains relatively unresearched and undocumented in developing countries. Understanding gender relations is particularly important in times of disaster, not only because women and children are disproportionately affected, but also because emergency interventions can seriously compromise the long-term future for women by creating further imbalance in their relations with men at a time of stress.

It has been reported that socially disadvantaged individuals are especially likely to show symptoms of psychological distress. The third hypothesis to be tested was that *within the drought area, the lower the individual's social economic status, the higher would be their levels of anxiety (State & Trait) and emotional distress.*

Although no specific hypotheses were formulated, relationships between psychological responses and other variables (i.e. age and working situation) were also studied. Mediating factors (threat perception, coping, and social support) were also tested regarding the drought and no-drought communities and demographic variables.

Of all the disaster-related risks considered, terror and horror are the most clearly associated with mental health problems such as PTSD. Because the present study evaluates a slow-onset disaster, which does not involve terror or horror, it was hypothesized that *the PTSD incidence in the drought area would be similar to the incidence in the no-drought area.*

Method

Research Setting

Paraíba state covers an area of 56.372km^2 in Northeastern Brazil. The state contains 171 municipalities and 249 districts. The 1991 census registered 3,200,677 inhabitants. Large areas of Paraíba state have been extensively exposed to prolonged periods of drought. Even though drought has been common, there has been no psychological study on stress effects of prolonged drought.

Even though areas within Paraíba are prone to periodic and chronic droughts, there are certain areas of the state which are not affected. The rainfall differences are due to two important factors. First, the proximity to the Atlantic ocean is responsible for humidity, such that, on the coast, the climate is hot and humid. As you move inland the air becomes drier. And second, the topography is another important factor for diversity in the climate. The drought-prone area is located in a depression between the "Tabuleiros," with a varying altitude from 20-30 to 200 meters above sea level, and the "Borborema" Plateau, with altitudes varying from 500 to 600 meters above sea level. The altitudes in the depression area only reach as high as 130 meters above sea level.

The Department of Geography, at the Federal University of Paraíba, was consulted regarding the areas of drought and no-drought in the state. Based on their information, two urban communities were selected. The first community, Queimadas (drought area) had 32,555 inhabitants in 1991. Agriculture is the main industry, with cotton the main crop. Subsistence plantation and livestock can be found to a lesser degree. Queimadas is in a drought-prone area located in a geographical depression that

deprives it of much of the moisture that other areas in the state receive, and that led to a history of recurring droughts. In Queimadas, the annual level of precipitation is 600mm. Overtime in Queimadas, the drought cycles between periods of minor lack of moisture to severe droughts. During the period of data collection, conditions showed some evidence of drought, but was not near the lowest point in the usual cycle of drought severity. However, this happened to be the period when due to funding and travel opportunities my research could be conducted.

The second community, Areia (no-drought) had 28,130 inhabitants in 1991, and its main agriculture production is sugar cane. It is located in the "Borborema" Plateau. The eastern part of the "Borborema" Plateau, where Areia is located, annually gets between 1400mm and 1600mm of rain from the coast, thereby influencing the climate and the vegetation.

The Sampling Process

Prior to the arrival of the research team, the principal investigator visited the two communities to get acquainted with the local reality. Meetings with the local authorities provided information about the research. Analyses of residence lists and city maps obtained from the Brazilian Institute of Statistics and Geography and from each City Hall provided the information necessary to start the sampling process.

The household was the initial basis for determining the sample. A household was defined as the residence for a nuclear or extended family. To achieve subsamples of approximately 100 respondents, it was decided to sample every 10th household. This process resulted in 102 households being selected as research targets in each community.

An additional 20 households in each city were identified to be used as replacements when households selected for the sample were either declared vacant or the target person refused to cooperate. Households had to be visited four times before being considered vacant and replaced.

A detailed sampling process was used to choose a particular respondent within each household. Each respondent had to meet several criteria before being selected. At a minimum, the participants had to be 18 years or older, and had to actually reside in the household. Anyone visiting from out of town was excluded. Only married heads of households (either male or female) were sampled. It was felt that the head of the household, whether male or female, would be under pressure of economic demand and responsibility to care for the family. The criterion of marital status helped to ensure a homogeneity of the samples and to enable more equitable comparisons of emotional distress and anxiety responses of men and women. To assure an equal distribution, the gender of the person to be interviewed was pre-determined for each house. Specifically, every other household was designated for a person of each gender. In this way the sample was equally divided into females and males. This information was pre-recorded on the front of the questionnaire booklet. Only when all of the aforementioned prerequisites were met could the interview proceed.n. Incidentally, no house was excluded because of an inability to contact and interview a married head of the household. In short we did not encounter any single headed household.

In Queimadas four households were dropped and in Areia five were dropped because they were declared vacant. In addition, there were three refusals to participate in

Queimadas and four in Areia. The reason consistently given for refusal was lack of time.

For other reasons, additional participant loss occurred. In Queimadas two females and two males began, but discontinued the interview. Two females and one male said they were tired and considered the questionnaire too long. The other male participant was concerned and cautious about the nature of the questionnaire, and requested the interview to be terminated. In Areia only one male discontinued the interview, because it was too long. The numbers and reasons for withdrawal were not sufficiently different across communities to bias the sampling.

Final Sample

The final sample in Queimadas consisted of 102 households, with 91 households from the original sample plus 11 from the supplementary sample. In Areia, the final sample consisted of 102 households, with 92 households from the original sample plus 10 from the supplementary sample.

Interviewers and Training

The research team consisted of the principal investigator and five student interviewers (two females and three males) selected from the Department of Psychology, at the Federal University of Paraíba (UFPb). The interviewers were paid a stipend consistent with local rates.

The interviewers' selection process started with a meeting with the head of the Department of Psychology and the undergraduate coordinator. During the meeting the research goals were explained and the content of the psychology courses was discussed to identify the courses which the students should have or should be taking to prepare them to

participate in the research. The chosen courses were research methods, psychopathology and counseling. The research methods course provided the student with information regarding the research process and guidelines to be followed while collecting the interview data. The psychopathology and counseling courses provided useful information to assist the interviewer to conduct the interview effectively, to identify if a participant showed signs of distress during the interview, and to deal with any possible crisis intervention. The class schedules were obtained from the department for recruiting purposes.

To recruit interviewers, the author went to classrooms to inform the students about the research. In addition, announcements were posted. Twelve students, seven females and four males applied and participated in a training program of eight hours duration. The training program included a detailed explanation of the interview process, the questionnaire booklet, and discussion of some problems that could arise during administration. Role-play exercises were used to acquaint them with the interview process and measures.

After training, two females and three males students were selected to participate in the research. A supplementary list was kept in case any of the chosen students were prevented from participating. All interviewers had travelled many times inland and were familiar with the local culture and language.

It was decided that the interviewers' gender should be matched with the gender of their interviewees. This was done for two reasons: Husbands of female participants might become suspicious if a male interviewer arrived at his home asking to talk to his wife. By

the same token, female participants would not feel comfortable talking about a traumatic event (e.g., rape) with a male interviewer, and male participants would feel uncomfortable talking about their fears with a female interviewer. To minimize these problems, male interviewers interviewed males participants and, female interviewers interviewed female participants. To address data collection problems and promote accurate recording, the principal investigator was at the research site during the data collection, and served as one of the interviewers. She verified the data collected each day by jointly going over the data collected and discussing any problems that might have occurred with each interviewer.

Measures

The questionnaire booklet (Appendix A) consisted of six introductory questions, followed by four psychometric scales: State-Trait Anxiety Inventory (STAI), Self-Reporting Questionnaire (SRQ-20), the Trauma Sequelae Questionnaire (PTSD) and, the Mediating Factors Questionnaire. Several final questions targeted demographic information. The order of the first three psychometric scales were alternated (STAI-SRQ-PTSD; SRQ-PTSD-STAI; PTSD-STAI-SRQ) to protect against order effects. The order of the introductory questions, the Mediating Factors Questionnaire, and the demographic information was fixed for all booklets.

Introductory Questions

Six introductory questions were asked to create rapport for the remaining questions (Section 1). These questions asked how long the participant had been living in the community, if he/she liked it, what he/she did not like about it, and if he/she had

family members who moved away and where they went.

State-Trait Anxiety Inventory (STAI)

State-Trait Anxiety Inventory (Spielberger et al., 1970) is comprised of separate self-report scales for measuring two distinct anxiety concepts: state anxiety (A-State), which measures how the person feels at the moment of the interview (Section 2a) and, trait anxiety (A-Trait), which measures how the person generally feels (Section 2b). These were developed for research with non-psychiatrically-disturbed adults. The STAI consists of 20 questions for each scale (A-State and A-Trait). Sample items of the A-State questionnaire are: "I feel upset," "I feel at ease." Sample items of the A-Trait questionnaire are: "I tire quickly," "I feel like crying." See Appendix A, Sections 2a (A-State) and 2b (A-Trait) for the full scales. This measure was already available in Portuguese, having been translated and backtranslated for use in Brazil (see Biaggio, Natalicio and Spielberger, 1976).

Self-Reporting Questionnaire (SRQ-20)

The Self-Reporting Questionnaire was designed by Harding et al. (1980) to study mental illness in primary care settings in developing countries (Section 3). The questionnaire is a screening instrument designed to identify non-psychotic psychiatric disturbance in primary care settings and in the community. These disturbances are referred as emotional distress. The SRQ consisted of 20 questions which can be answered by yes or no. If a person answers yes, it is scored as 1, indicating that the symptom was present during the last month. If the person answers no, it is scored as 0, indicating that the symptom was absent. It has been used as either a self-administered or an interviewer-

administered questionnaire (WHO, 1994). A sample of items of the SRQ-20 includes: "Do you often have headaches?" "Is your digestion poor?" This questionnaire was available in Portuguese, the translation and backtranslation having been undertaken by Harding et. al (1983).

Mari and Williams (1986) conducted a validity study using this scale at three primary care clinics in Sao Paulo; 875 patients completed the SRQ-20 questionnaire and a subsample of 260 was interviewed by a psychiatrist. The results showed that the SRQ-20 was a practical screening instrument for psycho-emotional disturbance in these settings. For the case/non-case threshold, using 7/8 as the cutoff score, sensitivity was 83% and specificity 80%. The questionnaire was a good indicator of morbidity.

The Trauma Sequelae Questionnaire

The Trauma Sequelae Questionnaire (Koverola et al., 1992) (Section 4) is a 23-item questionnaire designed to measure PTSD occurrence based on the DSM-IV criteria (Section 4). Although this measure is still in the process of validation, there is preliminary evidence of its concurrent validity. Hanna, Koverola, Proulx, and Battle (1992) investigated the incidence of PTSD in a sample of 833 female university students. They found that 6% of the subjects met the criteria for PTSD. These results were validated by administering the Structured Clinical Interview for the DSM-III-R - Nonpatient Edition (SCID-NP) (Spitzer, Williams, Gibbon, & First, 1990) to a subset of 45 subjects. Chi-square analyses of the results indicated no significant differences in the way that the Trauma Sequelae and the SCID-NP classified individuals as either PTSD positive or PTSD negative. Sample items of the Trauma Sequelae questionnaire include: "Do you

have recurring, distressing dreams about the experience?" "Have you experienced flashbacks (e.g., replaying of vivid memories of the experience)?" The complete Trauma Sequelae Questionnaire with its scoring criteria is reproduced in Appendix A, Section 4.

Mediating Factors Questionnaire

The Mediating Factors Questionnaire was constructed for the present study. The entire questionnaire is reproduced in Section 5. It consisted of three different sections: (a) Threat Perception; (b) Coping; and (c) Social Support. The threat perception section included six questions related to the participants views on the drought and its impact on their daily living. Four questions were measured in four-point Likert scales. The other two questions were "Who is responsible for the drought?" and "Do you feel the drought will end soon?"

To measure coping, a modified version of the Billings and Moos (1981) coping scale was used. Out of the 19 questions from the original questionnaire, 7 were kept, one was modified ("Try to reduce the tension by smoking more" to "Try to reduce the tension by drinking more") and one was added ("Accept and get used to it"). Participants were asked to evaluate these nine different coping strategies on five-point Likert scales labelled (1) always, (2) frequently, (3) sometimes, (4) rarely, and (5) never. If they lived in the drought area they were asked "When you think about the drought you:...". Persons in non-drought areas where asked to respond to these coping strategies more generally "When you have a problem you:...".

The social support section was developed for the present study. It addressed two different kinds of social support: instrumental support and emotional support. Three

questions, on four-point Likert scales, asked participants to evaluate the importance given to social support, the availability of, and how much the participants have used each kind of support. Following these questions, participants were asked to identify whether supports came from family, friends, government, church, or other sources. If the participants lived in the drought area they were asked "During the drought period...". Participants in non-drought areas where asked about the social support more generally "When you have a problem...".

To conclude the Mediating Factors Questionnaire two questions were asked regarding the participants' desires to move somewhere else, and if they were not sure about moving, why not?

Demographic Information.

The final section (Section 6) of the booklet contained ten questions regarding demographic variables such as age, income, religion, and working situation. These items are in Section 6 of the booklet.

Translation

The questionnaires which had not previously been translated, specifically, the Introductory Questions, the Trauma Sequelae Questionnaire, the Mediating Factors Questionnaire and the Demographic Information, were translated to Portuguese. Two fluent bilingual professors in the English Department of the Federal University of Paraiba were hired to translate these measures. The original measure was translated to Portuguese by one of the professors, and translated back into English by the other person who had never seen the English version. The two language versions were then compared. A pilot

study was conducted to identify any wording problems before the questionnaire was applied in the field. This procedure allowed for adaptation of items to the local vocabulary. For example, a change had to be made on the social support section of the Mediating Factors Questionnaire. Even though there is a corresponding word in Portuguese for the word "instrumental", it did not convey the desired meaning for the present study, and was replaced by the word "material." This decision was based on the agreement of the translators that this wording was preferable. Appendix B contains a Portuguese version of the questionnaire.

Procedure

The collated questionnaire booklet was administered orally in a face-to-face interview format conducted at each participants' home. Oral administration was chosen because of the possible illiteracy of some participants. For consistency of data collection all participants were interviewed orally regardless of their ability to read or write.

Initial calls on the households were made at any time throughout the day. Interviewers carried an identification card with their pictures and the name of the institution. Upon arrival they introduced themselves as students from the Federal University of Paraiba conducting a research survey. They then asked to talk with the maternal or paternal head of the household, when the person to be interviewed was met the interviewers explained the research objectives and gave assurances that the responses would be kept confidential. To ensure confidentiality, it was explained that all participants would be identified by number, so that no one could associate their answers with their name as the person who answered the questionnaires. Then it was asked if it

was a convenient time to conduct the interview or if the participant would like to reschedule for a more convenient time. Participants identified by this process were told that the participation in the study was completely voluntary and that the participant could stop the interview at any given time. After the participants gave their consent to take part in the research, they were asked to choose the room which would be the most quiet for conducting the interview.

Following the completion of the questionnaire, participants were asked if the interview raised any concerns, or if they had any questions regarding the study. Feedback was then provided to the participants. The interviewer thanked the participant for their time and contribution to the study. The entire interview took approximately one hour.

Results

The study was designed to compare psychological responses of individuals within a community experiencing chronic drought (Queimadas) with those living within a drought-free town (Areia) of the same state. Before examining score differences on the psychological measures, characteristics of the samples were compared by examining frequencies of their respective demographic variables. The frequency distributions of participants on age, income, work, and education across gender within each city are presented in Table 1.

Demographic Variables

Age. The participants ranged from 18 to 78 years of age in Queimadas (drought) and from 21 to 85 years of age in Areia. The average age of the participants in Queimadas was 46.50 with a standard deviation of 14.54. The average age of the participants in Areia

was 45.16 with a standard deviation of 14.53. Although age is a continuous variable, participants were clustered into three age groups to pursue further analyses related to each specific group: Young adults - ages 18 through 35 years, middle age - ages 36 through 55 years, and older age - ages 56 through 85 years. Although there were fewer males among young adults, in general the age distribution of the sample was comparable across communities.

Income levels. Income data were obtained as they were categorized by units of the minimum wage in Brazil at the time of the data collection, rather than as a continuous variable. At the time of the data collection, the minimum wage was the equivalent of Cnd$ 140.00 per month. The categories (a) up to 1 minimum wage, (b) 1 to 2 minimum wages, (c) 2 to 5 minimum wages, and (d) more than 5 minimum wages were selected from the Brazilian Geographic and Statistics Institute protocol (IBGE). Although the differences between the participants earning less than five minimum wages were not great, 73.5% in Queimadas, and 68.6 % in Areia, the percentage of participants earning more than five minimum wages was substantially greater in Areia (20.59% vs. 1.85%). Moreover, it is interesting to note that in Queimadas, 24.51% of the participants did not declare their income level when asked during the interview; this percentage was comparable to the percentage of the participants earning more than five minimum wages in Areia.

Employment. The working status of the participants was divided into five categories: employed, unemployed, housework, other (odd jobs) and retired. In both cities, none of the males participants reported the category "housework." A substantially

Table 1

Frequency Distribution of Participants for Age Group, Income, Work and Education by City and Gender

	Frequency	Queimadas			Areia		
		Male	Female	Total	Male	Female	Total
Age	Young adults (18- 35 years)	10	16	26	7	19	26
	Middle age (36-55 years)	27	20	47	29	22	51
	Older age (56-85 years)	14	15	29	15	10	25
Income	Up to 1 minimum wage	14	17	31	17	8	25
	1 to 2 minimum wages	11	17	28	10	19	29
	2 to 5 minimum wages	5	11	16	7	9	16
	More than 5 minimum wages	2	0	2	8	13	21
	Did not declare	19	6	25	9	2	11
Work	Employed	31	7	38	34	22	56
	Unemployed	9	11	20	3	0	3
	Housework	0	25	25	0	28	28
	Other	5	2	7	5	1	6
	Retired	6	6	12	9	0	9
Education	Illiterate	15	14	29	15	7	22
	Less than junior high	12	16	28	13	21	34
	Less than high school	19	17	36	9	5	14
	High school/university complete	5	4	9	14	18	32

greater percentage of persons from Areia (no-drought) were employed compared to those in Queimadas (drought), with the difference primarily due to the larger percentage of employed women in Areia (43.14% vs. 13.73). "Not employed" was substantially greater in Queimadas (19.61% compared to 2.91% in Areia).

Education. The most noticeable difference between the two samples was in terms of educational attainment. In Areia (no-drought) 31.37% of the participants had high school or university completed, whereas in Queimadas (drought) only 8.82% of the participants had reached that level. But, when illiteracy levels were compared, both communities were similar, in Queimadas 28.43% of the participants were illiterate and in Areia 21.57%. It is interesting to notice that in Areia the number of male participants who were illiterate was twice the number of illiterate women.

In summary, there were several demographic categories on which the two samples (drought vs. no-drought) differed substantially: income, work situation, and education level. Whether and how unexpectedly these differences may confound some of the findings related to anxiety and emotional distress measures will be discussed subsequently.

Anxiety and Emotional Distress Differences

Test order. The presentation order of the psychological measures was varied in three different sets across the test booklets (STAI (State & Trait), SRQ-20, and PTSD; SRQ-20, PTSD, and STAI (State & Trait); and PTSD, STAI (State & Trait), and SRQ-20). Separate one-way analyses of variance were conducted for each city to determine if the test order significantly influenced the results of the psychological measures. The

results indicated that the order of administering the questionnaires did not influence the means scores of the psychological measures. In Queimadas, the results were for the SRQ-20 scores, F (2, 99) = .75, p > .48, STAI1 (State) scores, F (2, 99) = 1.33, p > .27, and STAI2 (Trait) scores, F (2, 99) = 1.25, p > .29, and in Areia, for SRQ-20 scores, F (2, 99) = 2.81, p > .07, STAI1 (State) scores, F (2, 99) = .83, p > .44, and STAI2 (Trait) scores, F (2, 99) = 1,80, p > . 17. Test order has thus been ignored in all subsequent analyses.

City and gender. The study involved a complex of psychological measures on two samples subdivided equally by gender. A MANOVA was conducted to test the data. With the use of the Hotellings' criterion, the combined dependent variables (State & Trait anxiety and emotional distress) were significantly affected by city, F (3, 198) = 3.57, p < .02, and gender, F (3, 198) = 17.72, p < .00. The interaction was also significant, F (3, 198) = 3.53, p < .02. Univariate analyses were employed to test the source of the significant differences between the two samples on each of the dependent variables. The choice of using multiple univariate analyses, instead of multivariate analyses, with the present data followed the recommendations of Huberty and Morris (1989). First, they specify that multiple univariate analyses are appropriate when the research is exploratory in nature, such as the present circumstances where new relationships between independent (drought and no-drought) and outcome variables are being explored, and the association between these variables are being investigated to reach preliminary conclusions. Second, even though the outcome variables were inter-correlated, SRQ-20 and STAI1, r = .63, p < .01, SRQ-20 and STAI2, r = . 71, p < .01, and STAI1 and STAI2, r = .73, p < .01, no underlying construct was being assessed and each was treated

independently. In the present study, the interest was in how drought influenced each of the outcome variables. Finally, because some of the outcome variables have been previously studied in a univariate context, separate univariate ANOVAs allowed for comparisons with data collected from other disaster contexts.

The chosen alpha level for all statistical tests was .05. Effect sizes were also computed . Effect sizes (R^2) were determined as $v_1F/(v_1F+v_2)$ (v_1 and v_2 are the degrees of freedom). A small effect size was considered $R^2 = .01$, a medium effect size, $R^2 = .06$, and a large effect size, $R^2 = .14$ (Aron & Aron, 1994). Wherever multiple comparisons were conducted, the Bonferroni procedure was adopted to adjust the significance levels.

The descriptive statistics of STAI1 (State Anxiety), STAI2 (Trait Anxiety), and SRQ-20 (Emotional Distress) for males and females within each city are reported in Table 2. The possible range for both scales of the STAI is 20-80, with the higher scores reflecting higher levels of anxiety (State & Trait). The SRQ-20 scores range from 0 to 20, with the higher scores indicating higher levels of emotional distress. Satisfactory levels of internal consistency were found for all three measures in both cities. In Queimadas (drought), the alpha values were, STAI1 (alpha = .86), STAI2 (alpha = .86), and SRQ-20 (alpha = . 90), and in Areia (no-drought), STAI1 (alpha = .89), STAI2 (alpha = .89), and SRQ-20 (alpha = .92).

Table 2

Means and Standard Deviations of Psychological Measures by City and Gender

Measures		Queimadas (Drought)			Areia (No-drought)		
		M	SD	n	M	SD	n
STAI1 (State)	Male	33.22	5.18	51	31.25	5.18	51
	Female	42.14	11.42	51	37.22	10.72	51
	Total	37.68	9.90	102	34.24	8.90	102
STAI2 (Trait)	Male	36.04	5.99	51	34.43	6.21	51
	Female	46.75	9.76	51	40.90	11.59	51
	Total	41.39	9.64	102	37.67	9.80	102
SRQ-20	Male	4.16	3.16	51	2.24	2.46	51
	Female	6.61	4.32	51	5.63	4.82	51
	Total	5.38	4.33	102	3.93	4.16	102

The first hypothesis to be tested was that individuals living in a drought area would have higher levels of anxiety (STAI1-State & STAI2-Trait) and emotional distress (SRQ-20) than individuals living in a no-drought area. The second hypothesis stated that within the drought area women would have higher levels of anxiety (STAI1 & STAI2) and emotional distress (SRQ-20) than men. These hypotheses were tested by separate two-way ANOVAs (city by gender) for each of the three measures.

The results of the analyses for STAI1 (State Anxiety) are reported in Table 3. There was a significant main effect for city. The participants living in Queimadas (drought) reported significantly higher levels of state anxiety than did participants living

in Areia (no-drought) (M = 37.68 vs. 34.24, F (1, 202) = 8.07, p < .05).

Table 3

Comparison of STAI1 Scores by Gender and City

Source	df	F	R^2
Omnibus			
Main Effect			
City	1, 200	8.07*	.04
Gender	1, 200	37.75**	.16
Interaction city by gender	1, 200	1.49	.00
Simple Effects			
City within males	1, 200	1.31	.01
City within females	1, 200	8.26*	.04
Gender within Queimadas	1, 200	27.13**	.12
Gender within Areia	1, 200	12.11**	.06

Note. MSE = 74.81
* p < .05. ** p < .01

Regarding the main effect for city, post hoc effect analyses, computed by SPSS MANOVA procedure for estimating simple effects (Keywords, 1993), revealed that the differences between females across cities was responsible for the significant results, with females in Queimadas (drought) (M = 42.14) showing significantly higher levels of state anxiety than females in Areia (no-drought) (M = 37.22), F (1, 200) = 8.26, p < .05. There was also a significant main effect for gender of participants, with females showing higher levels of anxiety than males (M = 39.68 vs. M = 32.24, F (1, 200) = 37.75, p < .01). For gender, post hoc analyses revealed that regardless of the city they were living, females

consistently had higher levels of the state anxiety than males. In Queimadas, females (M = 42.14) had higher levels of STAI1 than males (M = 33.22), F (1, 200) = 27.13, p < .01, and in Areia the difference was also significant (females, M = 37.22 vs. males, M = 31.25), F (1, 200) = 12.11, p < .01. The interaction effect was not significant.

The results of the analyses for STAI2 (Trait Anxiety) are reported in Table 4. There was a significant main effect for city. The participants living in Queimadas (drought) scored significantly higher in trait anxiety than did participants living in Areia (no-drought), M = 41.39 vs. 37.67, F (1, 200) = 9.32, p < .01. According to post hoc simple effect analyses, the significance of these results were due to the females differences, males did not show any significant differences. Females in Queimadas (drought) (M = 46.75) showed higher levels of trait anxiety than females in Areia (no-drought) (M = 40.90), F (1, 200) = 11.46, p < .01. There was also a significant main effect for gender of participants, F (1, 200) = 49.52, p < .01, with females (M = 43.82) showing higher levels of trait anxiety than males (M = 35.24). Regardless of the city in which they were living , females consistently had higher levels of trait anxiety than males. In Queimadas, females (M = 46.75) reported significantly higher levels of trait anxiety than males (M = 36.04), F (1, 200) = 38.48, p < .01, as well as in Areia, with females (M = 40.00) reporting higher levels than males (M = 34.43), F (1, 200) = 14.05, p < .01. The interaction effect was not significant.

Table 4

Comparison of STAI2 Scores by Gender and City

Source	df	F	R^2
Omnibus			
Main Effect			
City	1, 200	9.32**	.04
Gender	1, 200	49.52**	.20
Interaction city by gender	1, 200	3.01	.01
Simple Effects			
City within males	1, 200	.87	.00
City within females	1, 200	11.46**	.05
Gender within Queimadas	1, 200	38.48**	.16
Gender within Areia	1, 200	14.05**	.07

Note. MSE = 75.96
** $p < .01$

The results for STAI1 (State) and STAI2 (Trait) supported the first hypothesis which stated that participants in the drought area would have higher levels of anxiety (State & Trait) than participants in the no-drought area. The results also supported the second hypothesis, which stated that within the drought area, women would have higher levels of anxiety (State & Trait) than men.

For the SRQ-20 results (Table 5), there was a significant main effect for city, F (1, 200) = 6.69, $p < .01$. The participants living in Queimadas (drought) scored significantly higher in the emotional distress levels than persons living in Areia (M = 5.38 vs. 3.93, F (1, 200) = 5.94, $p < .01$). Post hoc simple effect analyses revealed that this main effect

was due to males (M = 4.16) in Queimadas (drought) having significantly higher levels of emotional distress than males (M = 2.24) in Areia (no-drought), F (1, 200) = 5.87, p < .05. There was also a significant main effect for gender, with females (M = 6.12) having significantly higher levels of emotional distress than males (M = 3.20), F (1, 200) = 27.14, p < .01. This difference was consistent across cities, with females in Queimadas (M = 6.61) scoring significantly higher in emotional distress than males (M =4.16), F (1, 200) = 9.55, p < .01, and females (M = 5.63) in Areia had significantly higher levels of emotional distress than males (M = 2.24), F (1, 200) = 18.29, p < .01. The interaction effect was not significant.

Table 5

Comparison of SRQ-20 Scores by Gender and City

Source	df	F	R^2
Omnibus			
Main Effect			
City	1, 200	6.69*	.03
Gender	1, 200	27.14**	.12
Interaction city by gender	1, 200	.70	.00
Simple Effects			
City within males	1, 200	5.87*	.03
City within females	1, 200	1.53	.01
Gender within Queimadas	1, 200	9.55**	.05
Gender within Areia	1,200	18.29**	.08

Note. MSE = 16.04
* p < .05. ** p < .01.

In summary, the results for the SRQ-20 supported the first and the second hypotheses, with participants in the drought area having higher levels of emotional distress than participants in the no-drought area, and women having higher levels of emotional distress than men in the drought area. However, women in the drought area did not differ from women in the no-drought area.

Socio-economic status. The third hypothesis to be tested was that the lower the individual's socio-economic status in the drought area (Queimadas), the higher would be their levels of anxiety (State & Trait) and emotional distress. Although there was no single measure of SES, socio-economic status was assumed to be indicated by participant's income and education level. These variables were tested separately rather than combined in a composite score because of the unique view of SES within Brazil. Typically, SES in Brazil is evaluated by income alone. Education often does not correlate with levels of income as it does in North America. The descriptive statistics of STAI1 and STAI2, and SRQ-20 are reported for income levels in Table 6, and for education levels in Table 7.

Participants' scores for STAI1 (State), STAI2 (Trait), and SRQ-20 within Queimadas were analyzed using three separate two-way analyses of variance (income x education). Whenever main effects were significant, Tukey-HSD tests (Howell, 1992) were used to assess significant differences between specific groups. In Queimadas (drought), there were no significant main effects for STAI1 (State Anxiety) and STAI2 (Trait Anxiety), and neither measure showed significant interaction effects.

Table 6

Means and Standard Deviations of Psychological Measures in Queimadas by Income Level

Measures	Levels	M	SD	n
STAI1 (State)	Up to 1 minimum wage	41.45	11.77	31
	1 to 2 minimum wages	38.11	9.75	28
	2 to 5 minimum wages	35.50	9.67	16
	More than 5 minimum wages	30.50	2.12	2
	Did not declare	34.48	6.08	25
STAI2 (Trait)	Up to 1 minimum wage	45.19	10.66	31
	1 to 2 minimum wages	40.82	9.02	28
	2 to 5 minimum wages	40.69	8.00	16
	More than 5 minimum wages	29.00	1.41	2
	Did not declare	38.76	9.05	25
SRQ-20	Up to 1 minimum wage	7.13	4.10	31
	1 to 2 minimum wages	4.82	4.43	28
	2 to 5 minimum wages	3.94	4.17	16
	More than 5 minimum wages	4.50	2.12	2
	Did not declare	4.84	4.32	25

Table 7

Means and Standard Deviations of Psychological Measures in Queimadas by Education Levels

Measures	Levels	M	SD	n
STAI1 (State)	Illiterate	39.38	11.86	29
	Less than junior high	38.25	10.68	28
	Less than high school	36.06	8.00	36
	High school/university complete	36.89	7.47	9
STAI2 (Trait)	Illiterate	42.14	10.02	29
	Less than junior high	43.50	10.81	28
	Less than high school	40.19	8.90	36
	High school/university complete	37.00	6.75	9
SRQ-20	Illiterate	7.62	4.88	29
	Less than junior high	5.64	3.60	28
	Less than high school	4.06	3.97	36
	High school/university complete	2.67	2.45	9

For the SRQ-20, there was a significant main effect for education within Queimadas (drought), $F(3, 64) = 4.12$, $p < .05$. This result is consistent with the hypothesis that the higher the level of education, the lower the levels of emotional distress. Tukey-HSD tests showed that there were significant differences between illiterate level ($M = 7.62$) and both less than high school ($M = 4.06$) and the high school and university complete levels ($M = 2.67$). The interaction effect of income by education was not significant.

Age group. Because prior disaster research has been inconsistent in reported effects on specific age groups, no specific hypothesis was formulated on the psychological responses to drought. The descriptive statistics of STAI1 (State), STAI2 Trait), and SRQ-20 within each city by age groups are reported in Table 8. To test for differences between age groups, the participants' scores for the three measures were analyzed using a 3 (young adults = 18-35 years, middle age = 36-55 years, and old age = 56-85 years) X 2 (city: drought and no-drought) factorial design.

Table 8

Means and Standard Deviations of Psychological Measures by Age Group and City

		Queimadas (Drought)			Areia (No-drought)		
Measures	Groups	M	SD	n	M	SD	n
STAI1 (State)	Young adults (18-35 years)	36.27	7.81	26	35.31	10.54	26
	Middle age(36-55 years)	37.09	10.26	47	33.94	7.43	51
	Older age (56-85 years)	39.90	10.90	29	33.72	10.05	25
STAI2 (Trait)	Young adults (18-35 years)	40.77	9.87	26	38.04	11.81	26
	Middle age (36-55 years)	40.83	9.53	47	38.16	8.49	51
	Older age (56-85 years)	42.86	9.95	29	36.28	10.31	25
SRQ-20	Young adults (18-35 years)	3.88	3.14	26	4.62	5.28	26
	Middle age (36-55 years)	4.68	4.00	47	3.37	3.13	51
	Older age (56-85 years)	7.86	4.82	29	4.36	4.74	25

The results for STAI (State) and STAI2 (Trait) showed only significant main effects for city, $F(1, 198) = 6.17$, $p < .05$ and $F(1, 198) = 7.77$, $p < .01$, respectively. These results indicated that participants living in Queimadas (drought) had higher levels

of both State (M = 37.67 vs. 34.24) and Trait (M = 41.39 vs. 37.67) anxiety than participants living in Areia (no-drought).

The results for SRQ-20 revealed significant main effects for age groups, young adults (M = 4.25), middle age (M = 4.00), and older age (M = 6.24), F (2,198) = 4.74, p < . 05, and for city, Queimadas (M = 5.38) and Areia (M = 3.93), F (1, 198) = 5.10, p < . 05. Post hoc simple effect analyses conducted to identify the source of the significant results, indicated that in the drought area older participants had significantly higher levels of emotional distress (SRQ-20) (M = 7.86) that both young adults (M = 3.88), F (1, 198) = 12.77, p < .01, and middle age participants (M = 4.68), F (1, 198) = 10.69, p < . 01. Also, older participants (M = 7.86) in Queimadas had significantly higher levels of emotional distress than older participants (M = 4.36) in Areia, F (1, 198) = 9.70, p < .01. There was a significant interaction for age groups (young adults vs. older age), F (2, 198) = 3.49, p < . 05. In Queimadas (drought), older participants had significant higher levels of emotional distress than young participants, M = 7.86 vs. M = 3.88, respectively, whereas in Areia (no-drought), there was no significant differences between the two groups.

Working situation. Additional statistical tests were conducted to explore whether the working situation had an effect on the psychological responses within each city. The descriptive statistics of STAI1 (State), STAI2 (Trait), and SRQ-20 within each city by work situation are reported in Table 9.

To assess any significant differences for the psychological measures between "employed" and "unemployed" categories in Queimadas (drought), t -tests were

employed. The results for STAI (State) and SRQ-20 were not significant. For the STAI2 (Trait), employed participants (M = 36.71, SD = 7.56) had significant lower levels of trait anxiety (STAI2) than unemployed participants (M = 43.35, SD = 9.92, t (56) = 2.62, p < .05. Because of the sample size for "unemployed" (n = 3) in Areia, meaningful analyses could not be conducted within the no-drought area.

Table 9

Means and Standard Deviations of Psychological Measures by Work Situation and City

		Queimadas (Drought)			Areia (No-drought)		
Measures	Categories	M	SD	n	M	SD	n
	Employed	35.13	8.67	38	32.52	7.81	56
	Unemployed	37.10	7.45	20	39.67	12.01	3
STAI1 (State)	Housework	40.44	11.30	25	37.29	10.86	28
	Other	37.86	13.64	7	38.83	8.52	6
	Retired	40.83	10.97	12	30.56	2.30	9
	Employed	36.71	7.56	38	36.14	8.45	56
	Unemployed	43.35	9.92	20	40.00	11.27	3
STAI2 (Trait)	Housework	47.12	9.30	25	41.36	12.38	28
	Other	39.86	13.11	7	39.17	9.22	6
	Retired	41.92	7.61	12	33.89	6.01	9
	Employed	3.79	3.66	38	3.09	3.72	56
	Unemployed	5.65	3.67	20	5.00	4.58	3
SRQ-20	Housework	6.32	5.23	25	6.07	4.94	28
	Other	6.57	3.91	7	3.83	2.48	6
	Retired	7.33	4.46	12	2.22	2.91	9

Post-traumatic Stress Disorder (PTSD) by City and Gender

Post-traumatic stress disorder (PTSD) incidence has been frequently assessed during the aftermath of fast-onset disasters. For exploratory purposes, the incidence of PTSD occurrence within the present slow-onset disaster context of drought was examined. Frequency counts of PTSD by city and gender are presented in Table 10.

Table 10

PTSD Frequency Count by City and Gender

	Queimadas (Drought)		Areia (No-drought)	
Measure	Male	Female	Male	Female
No-PTSD	50	43	49	43
Sub-clinical PTSD	1	2	1	3
PTSD	0	6	1	5

There were no significant differences between the two communities regarding sub-clinical PTSD and PTSD incidence. However, when gender was taken into account, the majority of the cases with PTSD were found to be among women. Drought was never spontaneously reported during the interview as a traumatic event by the participants of the study. A car accident or viewing a tragic death were types of situations mentioned by participants as traumatic.

Mediating Factors by City and Demographics

Psychological responses to disasters should be viewed as a process mediated by different factors related to characteristics of the disaster itself, the social network and

individual characteristics. Some of these mediating factors, such as threat perception, coping, and social support, were explored in the present study.

Threat perception. A composite general threat perception variable was created by averaging the four test items concerning threat. The values were coded in the reversed order of the original values in the questionnaires so that larger values indicated greater threat perception, with total scores ranging from four to 16. The reliability coefficient for this scale was .91. The descriptive statistics for threat perception according to each of the demographic variables are reported in Table 11. ANOVAs were conducted to evaluate differences for threat perception across cities and demographic variables. The only significant result was for city. Contrary to expectation, participants living in Areia (no-drought) (M = 13.20, SD = 3.34) reported significantly higher levels of threat perception than did the participants living in Queimadas (drought) (M = 9.54, SD = 3.93), F (1, 202) = 51.26, $p < .01$.

To further explore this relationship between threat perception and each of the psychological measures (i.e., anxiety (State & Trait) and emotional distress), Pearson Product-Moment correlation coefficients were computed. These results are reported in Table 12. For women in the drought area, a tendency for positive correlations to obtained between threat perception and each of the psychological measures, implying that the higher the levels of threat perception, the higher the levels of anxiety (State and Trait) and emotional distress. However, for men no such relationship was found in Queimadas. In the no-drought area, the tendency for positive relationships between threat perception and psychological response was present, but for males only.

Table 11

Means and Standard Deviations of Threat Perception by Demographic Variables

Variable	M	SD	n	F
City				
Queimadas	9.54	3.93	102	51.26**
Areia	13.2	3.34	102	
Gender				
Male	11.14	3.52	102	.65
Female	11.6	4.57	102	
Age Group				
Young Adults (18-35 years)	11.31	4.36	52	.35
Middle Age (36-55 years)	11.59	3.80	98	
Older age (56-85 years)	11.02	4.32	54	
Income[1]				
Up to 1 minimum wage	12.09	3.64	56	.78
1 to 2 minimum wages	10.96	4.50	57	
2 to 5 minimum wages	11.22	3.79	32	
More than 5 minimum wages	11.78	4.74	23	
Did not declare	10.75	3.81	36	
Work				
Employed	11.78	3.54	94	1.48
Not employed	9.61	4.78	23	
Work at home	11.6	4.58	53	
Other	10.62	4.31	13	
Retired	11.33	3.8	21	
Education				
Illiterate	11.35	4.43	51	1.31
Less than junior high complete	11.92	3.79	62	
Less than high school complete	10.32	3.96	50	
High school/university complete	11.82	4.06	41	

Note. [1] "Did not declare" group was not included in the analyses. ** $p < .01$.

Table 12

Correlation Between Threat Perception and Anxiety (State & Trait) and Emotional Distress Measures

	Threat Perception			
	Queimadas		Areia	
	Males	Females	Males	Females
STAI1 (State)	.03	.25	.21	.09
STAI2 (Trait)	.10	.30*	.29*	.10
SRQ-20	.07	.23	.28*	.13

Note. * $p < .05$

Coping. At the planning stages of this research, the Coping Questionnaire was modified from its original version, in response format and in the wording of some items. At the time, the changes seemed to be adequate. However, during analyses it became obvious that scores could no longer be computed in a fashion that permitted comparability with the original scale scores. An alternative to accomplish some understanding of these data simply was to compute means and standard deviations separately for each of the nine coping strategies. Moreover, because the question of the use of the coping strategies was different for drought and no-drought participants, no comparisons could be made between the two communities. The descriptive statistics for the nine coping strategies in Queimadas are reported in Table 13. Each of the strategies were rated on 5-point Likert scales, and were coded so that larger values reflect greater use of the coping strategy. The most commonly used coping strategy by all participants in

Queimadas was "Pray for guidance and strength." The second most frequently used strategy was "Take things one step at a time." The two least used coping strategies were "Prepare for the worst" and "Try to reduce tension by drinking more." No further statistical analyses were conducted.

Table 13

Means and Standard Deviations of the Use of the Coping Strategies in Queimadas

Coping Strategies	M	SD
Pray for guidance and strength	4.03	1.09
Take things one step at a time	3.53	1.07
Consider several alternatives for handling the problem	3.35	1.19
Try to see the positive side	3.33	1.53
Didn't worry about it	3.19	1.32
Accept and get used to it	2.95	1.47
Draw on past experiences	2.95	1.37
Prepared for the worst	2.81	1.57
Try to reduce tension by drinking more	1.32	.71

Social support. A composite general social support scale was created by averaging the relevant 4 items test concerning availability, and use of social support (frequency). The values were coded in the reversed order of the original values in the questionnaires so that larger values reflected greater social support. The reliability coefficient for this scale was .69. The descriptive statistics for social support on each of the demographic variables are reported in Table 14.

Table 14

Means and Standard Deviations of Social Support by Demographic Variables

Variable	M	SD	n	F
City				
Queimadas	11.04	3.08	102	.56
Areia	11.33	2.51	102	
Gender				
Male	11.79	1.93	102	10.00**
Female	10.58	3.36	102	
Age Group				
Young Adults (18-35 years)	11.13	3.17	52	2.47
Middle Age (36-55 years)	11.00	2.36	98	
Older age (56-85 years)	11.57	3.17	54	
Income[1]				
Up to 1 minimum wage	10.62	3.22	56	2.61
1 to 2 minimum wages	10.63	2.86	57	
2 to 5 minimum wages	11.81	2.4	32	
More than 5 minimum wages	12.09	2.31	23	
Did not declare	11.80	2.33	36	
Work				
Employed	11.57	2.35	94	1.20
Not employed	10.65	3.97	23	
Work at home	10.66	3.14	53	
Other	11.00	1.53	13	
Retired	11.48	2.80	21	
Education				
Illiterate	11.12	3.15	51	.75
Less than junior high complete	10.71	2.84	62	
Less than high school complete	11.48	2.65	50	
High school/university complete	11.63	2.44	41	

Note. [1] "Did not declare" group was not included in the analyses. ** $p < .01$.

ANOVAs were conducted to evaluate differences for social support across cities and demographic variables. The only significant result was for gender. Male participants (M = 11.79, SD = 1.93) reported significantly higher levels of social support than did female participants (M = 10.58, SD = 3.36), F (1, 202) = 10.00, $p < .01$.

There was also an interest to assess who were the main providers of instrumental and emotional support. This information was obtained by an extra item, asking the participants' main source of instrumental and emotional support. In both cities, the family was the main source of instrumental support, Queimadas, 61.8%, and Areia, 72.5%. For emotional support, the family was also the main source, in Queimadas, 76.5%, and in Areia, 70.6%.

The Pearson Product-Moment correlation coefficient was computed to explore the relationship between social support and each of the psychological measures (i.e. anxiety (State & Trait) and emotional distress). The results are reported in Table 15. Only one of the correlations, a negative relationship for females in Areia, between social support and SRQ-20 was significant, r = -. 29, $p < .05$. All of the correlations between social support and STAI1 (State) and STAI2 (Trait) were negative, however none of these reached statistical significance.

Table 15

Correlation Between Social Support and Anxiety (State & Trait) and Emotional Distress Measures

	Social Support			
	Queimadas		Areia	
	Males	Females	Males	Females
STAI1 (State)	-.25	-.18	-.16	-.14
STAI2 (Trait)	-.14	-.14	-.21	-.23
SRQ-20	.04	.03	.02	-.29*

Note. * $p < .05$

Discussion

The present study, unlike traditional research conducted on fast-onset disasters in developed countries, has taken a different direction by studying in a developing country the effects of environmental conditions that gradually developed into a physical disaster with psychological consequences for persons living within a drought-prone area. Because there has been little research and not much understanding of the psychological consequences of drought, this study was somewhat exploratory, attempting to identify the range of psychological responses to the drought and the variables that influence the psychological outcome.

Psychological Accompaniments to Drought

Anxiety and Emotional Distress

The results of this exploratory study identified several measurable psychological responses to drought. Participants in the drought area showed significantly higher levels of anxiety and emotional distress than participants in the no-drought area. To understand these effects, it is necessary to consider the nature of the impact of drought on the individual and on the affected community. Unlike fast-onset disasters, there is no visible acute impact phase in the case of drought. The effects and consequences are not identified immediately and may even accumulate and grow over long periods of time. As a result, by the time there is public and government awareness and intervention is sought, it is often too late for effective response. When relief is provided it is more in form of mere subsistence rather than targeted towards rebuilding and restoring the community. In this context, the problem does not go away; it is a constant threat to the individual and to the community. The uncertainty and unpredictability of the future result in psychological manifestations of pervasive anxiety and heightened levels of emotional distress.

Confirmation of this pattern of psychological response to drought is a valuable insight in the absence of prior research into the effects of this slow-onset disaster. This pattern is also somewhat different from that encountered in fast-onset disasters such as earthquakes or volcanic eruptions. Among reactions to fast-onset events, post-traumatic stress disorder (PTSD) has been the most typically studied. Some of the risk factors associated with PTSD occurrence are direct consequences of the event such as threat to life, severe physical injury, exposure to grotesque injuries to others, and loss of loved

ones. Because none of these risk factors are typically found in the drought context, PTSD among participants in the present research was infrequent and its causes in those rare occurrences unrelated to the drought.

There are also differences in disaster relief and community response to fast- and slow-onset disasters. The fast-onset event typically is short lived. Soon there is a feeling that the worst is over, even though its consequences may last for some time. Because of the immediate visual identification of the scope and extent of destruction, such events are readily evaluated, and relief is often made available quickly so that the community can start the rebuilding process. The need to rebuild and the focus of attention and energy on the rebuilding process is a helpful coping mechanism that is inaccessible to the survivors of drought. With only the continuing plight that nature has dealt them and the prospect of shortages and an uncertain future, anxiety becomes a persistent psychological response to drought.

Macro Consequences of Drought

Although the focus of this research has been on individuals psychological response to drought, its effects on the economy and environment also have socio-cultural consequences on the context in which they live. Unlike the direct effects of a fast-onset disaster, the sources of the higher levels of anxiety and emotional distress found in the present study are likely more diffuse and indirect reactions to macro changes that emerge as the drought persists over time. Economically, drought affects all levels of the social system. Locally, the occurrence of a depressed economy normally accompanying drought can lead to unemployment and loss of savings. It can also disrupt different economic

sectors, creating regional instability, and depending on the length of the drought, may also impact at a national level. These consequences include rising food prices, shortages, and ultimately, in the most extreme case, famine. A related consequence is increased migration which in turn changes the social structure of the region.

Closely related to the economic aspects of drought is the depletion of natural resources that eventually impairs the productivity of the ecosystems within the region. This involves reduced growth, and withering of crops and wild vegetation. Dehydration and deaths from thirst, although rare in humans, are quite common for the domesticated animals and wild animals upon which the community depends. Furthermore, progressive worsening of water quality, possible contamination, and water-borne diseases impact on individuals' health.

Even though the drought periods have been frequent, the community in Queimadas is still operational with its main systems in place (e.g., medical, political). Because drought is a slow process to occur, the community has a chance to organize itself, and the residents have probably developed specific coping strategies to handle the harsh conditions they live in. In the literature, this collective coping mechanism has been identified as a "disaster subculture" (Wenger, 1978). Individual psychological adjustments to recurrent disasters, although not discussed in this literature, may occur in a fashion similar to the adaptive disaster subculture response of a community

Threat Perception and the Disaster Subculture

For example, contrary to expectations that individuals living in the drought-prone area would have a great fear of its occurrence because of its potential damaging

consequences, the findings in this study revealed the opposite: Participants in the drought area had significantly lower levels of threat perception than the no-drought participants. This unexpected difference can be explained by some combination of either heightened perceptions of threat by persons living in Areia or by lowered perceptions of threat by those living in Queimadas. In either case, the so called threat has different meanings depending upon where you live.

The plausible explanation that the diminished threat perception of the residents in Queimadas was due to their adaptation to this recurring stress suggests something similar to the processes encountered within what has been called a "disaster subculture." The concept of subculture emerged in the sociology literature where it has been described as "... group level coping mechanisms" (Hannigan & Kueneman, 1978, p. 130). Moore (1964) proposed the idea that this concept could be brought into the disaster context. His idea of a disaster subculture includes mechanisms, actual and potential, at social, psychological and physical levels which are used by residents of areas that are plagued by recurring events. Communities, and presumably the individuals who live within these societies, learn from experience, incorporating into their repertoires lessons they have learned from previous events. Communities with a history of recurring disasters are typically better able to respond to the next occurrence. The growing familiarity with the recurring event and its consequences, gradually change at a conceptual level the meaning of the event for the communities, which in turn influences the group's appraisal of threat.

Although disaster subculture is a sociological term applied to community processes, something similar must occur with individuals experiencing recurring threat.

The few studies on disaster subculture have been conducted on recurrent events such as floods (Hannigan & Kueneman, 1978) and hurricanes (Moore, 1964), contexts where residents are familiar with the phenomenon, and in which there are lengthy warning periods. These conditions are similar to those associated with the drought in Queimadas. All of this, however, is speculative in the sense that no direct measures were employed by which to assess the emergence of the "disaster subculture" in this study. Queimadas (drought) met all the conditions that according to Wenger (1978) should contribute to the emergence of a disaster subculture. Drought is both a repetitive and forecasted, slow-onset event. With recurring events, "the threat is "normalized;" events which most of us would consider unusual are placed within a framework that makes them meaningful and understandable" (Anderson, 1968, p. 299). These events are considered to be less psychologically threatening to individuals than less frequent events that may be unfamiliar to the stricken individuals and community (Bolin, 1986; Quarantelli, 1985; Warheit, 1985).

Alternatively, the unexpected differences between Queimadas and Areia may have been due to the heightened perception of threat by persons living in the no-drought area. Because these residents haven't experienced the drought personally, they can only speculate or imagine what it must be like. Newspaper accounts of the drought effects in Queimadas, usually portray the severity of conditions, encouraging fears and concerns that are not grounded entirely in reality. Areia residents' lack of direct experience with drought would lead to their heightened fear of the unknown. Unfortunately, nothing in the present data permits a conclusion in favour of either of the explanations, both of which

probably contributed to some degree.

Coping Mechanisms

Closely related are the strategies used to face the threat of disaster. In the literature, these cognitive processes developed in response to threat are called coping strategies (Lazarus, 1966). Coping strategies have been identified as important in determining personal adjustment following disaster. The most frequently reported coping strategy by participants in the drought area was "Pray for guidance and strength." The use of religion as a coping strategy has been reported by previous research (Ollendick & Hoffman, 1982; Patrick & Patrick, 1981). It is worth noting that there was a high percentage of Catholic participants in Queimadas, 91.2%. The least used strategies by all participants were "Prepare for the worst" and "Try to reduce tension by drinking more." Because of social desirability, the latter would have been less frequently reported.

Social support is another mechanism for coping with disaster. However, within the present study, it was not possible to identify any significant differences in social support levels between the two communities. Residents in the drought and no-drought areas reported high levels of social support across all demographics variables. These findings are likely due to the "ceiling effect" of social support within a collectivist society. In Brazil, there is a strong predisposition to develop strong family ties. The culture emphasizes very strong kinship systems, contributing to an extended kin function as a primary giver of both emotional and instrumental support. Considering these findings, it would be advisable in future research to employ more comprehensive measures that independently assesses the different dimensions of the social support

construct.

Drought Does not Affect Everyone the Same

Gender Effects

Although disasters are viewed as stressful events, it is an oversimplification to consider them as single events that affect everyone the same. Within the present study, psychological responses to drought were differential across gender. Women were significantly more anxious in Queimadas than in Areia. Men were significantly more emotionally distressed in Queimadas than in Areia. And women were significantly more anxious and emotionally distressed than men in general. To explain and understand these results, gender roles and responsibilities within this social and cultural context need to be considered.

The higher levels of anxiety shown by women in the drought area reflect their greater role vulnerability to the effects of disaster. The effects and consequences of drought undermine women's roles as producers and providers. Women are typically responsible for provision and preparation of food, collection of water, and the management of the home. In the drought context, all of these activities are disrupted and become a daily challenge. Crop failure impacts on the quantity and quality of food available, and not being able to feed the family properly increases women's frustration. Women may frequently deprive themselves of food in order to feed their dependents The reduction of water supplies contributes to health problems. These typically affect children first, increasing women's concerns and work. Sometimes, male migration in response to drought to look for better jobs elsewhere aggravates these conditions. This leaves the

woman responsible for the total care of the household, and additionally the work for which their partner was responsible. All these factors contributed to the significantly higher levels of anxiety for women in the drought area found in the present study.

In most developing countries, even in the absence of disasters, the fact that women are burdened with a greater amount of stress associated with social roles and expectations explains their significantly higher levels of anxiety and emotional distress than men in general. Women typically provide the bulk of household labor and family care, carrying disproportionate responsibility for their children, and sometimes elderly family members. Overall maintenance of the family structure rests heavily on women. Also in developing countries, because of the family economic situation, women join the labor force in addition to maintaining their domestic responsibilities, bringing additional stress. Although the norms for the STAI do not indicate gender differences, there are reasons to expect that women might have higher levels of stress than men. And that these levels might be additionally elevated under certain stressful conditions. For example, within North America, research (Cleary, 1987) has shown that even when there has been an increase in women's financial resources, women had less leisure time, were more dependent on their own income, and had increased financial responsibilities for their children. Some of these factors could be similar in developing countries.

Even though men undoubtedly experience stress under drought conditions, no significant differences were obtained on anxiety measures between men living in the drought and no-drought areas. A plausible explanation for this would be found within the cultural tendency almost universal among Brazilian men not to express or to report their

"feelings or emotions" for fear of being seen as weak. Although it may seem to be inconsistent, men in this study reported significantly higher levels of emotional distress in the drought than in the no-drought area. On this measure, the SRQ-20 scale, there are somatic items on which men may have felt comfortable reporting their distress.

Other Mediating Factors

Differences were explored for other variables, but because only isolated significant differences were found on few of these variables, each of these findings discussed below should be considered with caution. For example, the only significant result related to socio-economic status (SES) in this study was that in Queimadas (drought) participants with higher levels of educational attainment had lower levels of emotional distress. This is consistent with previous research showing that higher levels of education help to reduce the negative effects of stressful events (Green et al., 1985). Although research has consistently shown that higher socio-economic status, usually measured by income and education, is a good predictor of mental health and emotional well being (Gibbs, 1989), the drought and no-drought participants did not differ in anxiety measures according to their level of SES.

Age was another variable investigated, and the findings showed that older participants in the drought area had significantly higher level of emotional distress, however, anxiety levels did not vary as a function of age. A plausible explanation for the high levels of emotional distress was that this scale taps health problems as some of the indicants of emotional distress. Older participants may have responded to these items of the scale accordingly to their overall health condition and thereby inflated their emotional

distress scores. Of course, harsh conditions in the drought area also could have contributed to their poor health.

Within Queimadas, employed participants had significantly lower levels of trait anxiety than unemployed participants. The trait anxiety scale assessed the person's global condition, which likely reflected the long-term indirect effects of drought. Previous research on unemployment in general suggested it should impact on psychological distress (Kasl, Rodriguez & Lasch, 1999).

Limitations of the Study

Before concluding with an overview of the insights derived from this study and their implications for future research, it might be best to pause to consider the limitations imposed on this and any other study of drought.

First, although it is methodologically desirable to have pre- and post- measures to allow greater control and understanding of cause-effect relations, pre- and post-drought measures of participants' psychological health were not possible in this study. In fast-onset disasters at least, assessment of post-event psychological responses can be used. However, drought is a long-term process, and even post-event measures are difficult to obtain, because there is no clear time when the event is over. Queimadas has been affected by drought often, and it is not possible to identify clearly when the drought began nor when or whether it will end for all participants. In addition, because some effects and consequences of the drought are long lasting, they can still be present even though the drought itself could be considered technically over by other indicants.

Second, although efforts were made to match the two communities, drought

(Queimadas) and no-drought (Areia), as closely as possible except for the experience of drought, several systematic demographic differences between the two communities were found. In the no-drought area, the number of participants who earned more than five minimum wages was much higher than in the drought area. Regarding education, the no-drought area had a larger number of participants who had attained high school or university complete than in the drought area. In the drought area, the number of unemployed participants, especially unemployed women, was higher than in the no-drought area.

These differences were disconcerting, because it had been assumed that by selecting the communities on the basis of differences in average rainfall and comparability of size they would also be comparable in their demographics. The differences that were encountered, however, likely stemmed from the social, and economic development of both cities due to their respective historical climatic conditions. Queimadas has had a history of periodic drought that gradually and indirectly has changed and eroded some aspects of the community. This phenomenon and the difficulty of matching control communities, are likely to be found in almost all studies of drought. More sensitive methods for selecting the control and treatment cities are necessary in future research.

As a result of the problems in this study, and because of the unique characteristics of the communities and participants in the samples, confidence in the results and their generalizability are less than they might have been in a controlled experiment. Generalizability of the results also may be limited by the unique sample interviewed in

this study - married persons living in urban environments. Greater generalizability would likely be achieved in future research that included a wider range of the population, for example: People from rural as well as urban settings, single heads of household, and women whose husbands have migrated to look for better jobs. Individuals comprising the latter subgroup are persons that are likely to be particularly vulnerable to stress.

Similarly, it would seem advisable for future studies to systematically assess the psychological consequences at different levels of intensity of drought in different communities (e.g., in Africa and in Brazil). Markers such as rainfall indices, crop failure, food supply, and malnutrition indices, could be identified in each (carefully selected) community to provide means of establishing different levels of drought intensity. At the same time, assessment of individuals' psychological responses would provide some understanding of drought effects and consequences, and would map the pattern of human adaptation to this recurrent environmental hazard. This assessment should also include information about community recovery efforts, resources available, political and economic situations, which directly and indirectly influence the individuals' psychological responses to drought.

Concluding Remarks

Because of the sparsity of previous research, this study of the psychological responses of individuals living in a drought stricken area in a developing country was exploratory. Although the findings are preliminary and require confirmation in subsequent research, some conclusions could be reached and their implications for future studies identified.

First, a distinctive pattern of psychological response to drought was found. The findings revealed clearly that participants had significantly higher levels of anxiety and emotional distress. However, unlike the responses to fast-onset disasters, the occurrence of acute psychological responses such as PTSD was very low. This pattern of response seemed to be due to both the absence of a precipitous traumatic event and to the recurrent nature of the disaster and its chronic effects and consequences.

Second, the measures employed in the present study should not be viewed as assessing the only possible psychological responses to drought. The diffuse and indirect consequences of drought, its chronic, recurrent, and seemingly interminable nature provide a unique set of conditions confronting individuals in their daily lives. Over time, persons learn that these conditions are ever present and uncontrollable. Repeated exposure to events over which one does not have control may result in feelings of helplessness and resignation to ones' lot in life. A frequent accompaniment to such "learned helplessness" (Western, 1999) has been shown to be depression. Certainly it would be instructive to include such a measure in subsequent research to determine whether there is any measurable presence of depression that emerges in response to drought.

Third, it was evident, considering participants' threat perception levels in the drought area, that they did not view drought as a threat in their daily lives. This finding likely reflected their lengthy first-hand experience with the drought, and the opportunity to develop individual and group coping mechanisms. Researchers need to be sensitive to such mechanisms in the form of disaster subcultures within communities exposed to

recurring disasters, and how it may alter the pattern of psychological and social responses for individuals and the community. Because research on disaster subcultures have been almost exclusively conducted from a community approach, research is needed to assess its development from the perspective of the individual and how persons' collective response emerges as a community coping mechanism.

Although positive effects of a disaster subculture have been observed, some negative considerations that have been addressed theoretically (Wenger, 1978), require further investigation. A disaster subculture can hamper the community response when the nature and intensity of the hazard fall outside past patterns of community experience. The problem usually emerges when beliefs underestimate the strength of the hazard and the actual threat to be faced. If this protective coping mechanism shields the community from the threat, it may preclude the conditions that should normally mobilize actions to address the crisis. Research is needed to advance our understanding of the evolution of the disaster subculture and the factors which may implement or modify it.

Fourth, typically the focus of disaster research has been on negative psychological consequences and responses. Very few studies have addressed positive psychological responses as well (e.g., see Joseph et al., 1993), and the individual personality dynamics that underlie the ability to withstand the negative consequences of disasters. As part of a disaster subculture, certain individual characteristics may emerge. Future research should explore the elements that shape individuals' resilience to cope with a recurrent disaster. What are the underlying personality variables that contribute to an individual's ability to handle the excessive stress and promote a resilient or coping personal style. One study

(Joseph et al., 1993) suggests that self-esteem is a factor. Other variables may be involved and should be explored.

Finally, but among the most important findings were the significant gender differences found in the psychological response to drought. This study clearly showed the effects of women's role vulnerability due to their multiple responsibilities. Because gender differences have been minimally researched, and are relatively undocumented in disaster studies in developing counties, the present findings provide valuable insight for future research. Traditional psychological measures have been developed and standardized on university students within developed countries. Such measures often consider men and women to be equal, and much disaster research has proceeded on the assumption that they have the same social status and equal access to the same resources. Neither is true in most developing countries. Likely, social roles and cultural context played an important part in determining these gender differences on the psychological responses.

In summary, the findings in the present study clearly showed that drought does not affect everyone the same. It is evident that women's role vulnerability influenced their higher levels of anxiety and emotional distress in the drought-prone area. These findings provide helpful insights for planners designing strategies to mitigate the effects of drought that will inevitably recur.

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Appendix A

Section 1
Introductory Questions

01. Were you born here or did you move here from another city?
(1) Born here
(2) Moved here

02. How long have you lived here?
(1) Less than 6 months
(2) 6 months - 1 year
(3) 1 year - 2 years
(4) 2 years - 5 years
(5) 5 years and more

03. Do you enjoy living here?
(1) Not at all
(2) Somewhat
(3) Moderately so
(4) Very much

04. Do you have any family members who moved away from (city) to other parts of Brazil or other countries?

Relationship	Where
1. _____	_____
2. _____	_____
3. _____	_____
4. _____	_____

05. Do you find it difficult living here?
(1) Not at all
(2) Somewhat
(3) Moderately so
(4) Very much

06. What do you see as conditions that make it difficult to live here?
(1) Too many people (crowding)
(2) Not enough rain (drought)
(3) Inadequate housing
(4) Too far from hospital/doctor
(5) Other_____

Section 2a

SELF-EVALUATION QUESTIONNAIRE

Developed by C. D. Spielberger, R. L. Gorsuch and R. Lushene

STAI FORM X-1

Household No. _____ DATE _____

DIRECTIONS: A number of statements which people have used to describe themselves are given below. Read each statement and then blacken in the appropriate circle to the right of the statement to indicate how you *feel* right now, that is, *at this moment*. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe your present feelings best.

	NOT AT ALL	SOMEWHAT	MODERATELY SO	VERY MUCH SO
1. I feel calm	①	②	③	④
2. I feel secure	①	②	③	④
3. I am tense	①	②	③	④
4. I am regretful	①	②	③	④
5. I feel at ease	①	②	③	④
6. I feel upset	①	②	③	④
7. I am presently worrying over possible misfortunes	①	②	③	④
8. I feel rested	①	②	③	④
9. I feel anxious	①	②	③	④
10. I feel comfortable	①	②	③	④
11. I feel self-confident	①	②	③	④
12. I feel nervous	①	②	③	④
13. I am jittery	①	②	③	④
14. I feel "high strung"	①	②	③	④
15. I am relaxed	①	②	③	④
16. I feel content	①	②	③	④
17. I am worried	①	②	③	④
18. I feel over-excited and "rattled"	①	②	③	④
19. I feel joyful	①	②	③	④
20. I feel pleasant	①	②	③	④

Section 2b

SELF-EVALUATION QUESTIONNAIRE

STAI FORM X-2

Household NO._____ DATE _____

DIRECTIONS: A number of statements which people have used to describe themselves are given below. Read each statement and then blacken in the appropriate circle to the right of the statement to indicate how you *generally* feel. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe how you generally feel.

	ALMOST NEVER	SOMETIMES	OFTEN	ALMOST ALWAYS
21. I feel pleasant	①	②	③	④
22. I tire quickly	①	②	③	④
23. I feel like crying	①	②	③	④
24. I wish I could be as happy as others seem to be	①	②	③	④
25. I am losing out on things because I can't make up my mind soon enough	①	②	③	④
26. I feel rested	①	②	③	④
27. I am "calm, cool, and collected"	①	②	③	④
28. I feel that difficulties are piling up so that I cannot overcome them	①	②	③	④
29. I worry too much over something that really doesn't matter	①	②	③	④
30. I am happy	①	②	③	④
31. I am inclined to take things hard	①	②	③	④
32. I lack self-confidence	①	②	③	④
33. I feel secure	①	②	③	④
34. I try to avoid facing a crisis or difficulty	①	②	③	④
35. I feel blue	①	②	③	④
36. I am content	①	②	③	④
37. Some unimportant thought runs through my mind and bothers me	①	②	③	④
38. I take disappointments so keenly that I can't put them out of my mind	①	②	③	④
39. I am a steady person	①	②	③	④
40. I get in a state of tension or turmoil as I think over my recent concerns and interests	①	②	③	④

Section 3

Self Reporting Questionnaire - (SRQ)

01. Do you often have headaches?

02. Is your appetite poor?

03. Do you sleep badly?

04. Are you easily frightened?

05. Do your hands shake?

06. Do you feel nervous, tense or worried?

07. Is your digestion poor?

08. Do you have trouble thinking clearly?

09. Do you feel unhappy?

10. Do you cry more than usual?

11. Do you find it difficult to enjoy your daily activities?

12. Do you find it difficult to make decisions?

13. Is your daily work suffering?

14. Are you unable to play a useful part in life?

15. Have you lost interest in things?

16. Do you feel that you are a worthless person?

17. Has the thought of ending your life been in your mind?

18. Do you feel tired all the time?

19. Do you have uncomfortable feeling in your stomach?

20. Are you easily tired?

Section 4

Trauma Sequelae Questionnaire

Koverola, Proulx, Hanna, Battle & Chohan, 1992

People sometimes have life experiences that are extremely stressful and disturbing. We are interested in knowing more about how these experiences affect people. Examples of the types of experiences we are studying are:

(a) being involved in a disaster such as plane crash, fire, flood, or drought;
(b) experiencing a serious threat to your life or health, such as sexual or physical abuse or assault, having a life-threatening illness, or being seriously injured in an accident;
(c) experiencing a serious threat to the life or health of someone close to you (e.g., kidnapping, suicide);
(d) seeing another person who was seriously injured or dead.

If you have had any of these kinds of experiences during your life, please list each experience below, give a brief description, and give your age at the time of the experience.

Experience	Age
1. _____	_____
2. _____	_____
3. _____	_____
4. _____	_____
5._____	_____

If you listed more than one experience, please answer the following questions with regard to the experience you found most traumatic, and circle the number of the experience in the above list.

1. Do you have recurring, distressing memories of the experience which intrude on your life?

Yes____ No____

2. Do you have recurring, distressing dreams about the experience?

Yes____ No____

3. Have you had a sense of reliving the experience (For example, have you acted or felt as though the experiences were recurring? Include any experiences that happened upon awakening or when intoxicated)?

Yes____ No____

4. Have you experienced flashbacks (e.g., replaying of vivid memories of the experience)?

Yes____ No____

5.Have you experienced perceptual illusions (i.e. mistaken perceptions; for example, you thought you saw the abuser on the street, but it couldn't have been him/her)?

Yes____ No____

6. Have you experienced hallucinations (i.e. hearing or seeing things that aren't there)?

Yes____ No____

7. Do you feel distressed or upset when you are reminded of the experience ? (e.g., does the anniversary of the experience upsets you?)

Yes____ No____

8. Do you have other symbolic reminders of the experience? (E.g., objects, music, words or phrases which trigger memories of the experience?)

Yes____ No____

9. Do you find yourself reacting physically to things that reminds you of the experience?

Yes____ No____

In reference to questions 1 to 9, please answer the following:

(a) How long have any of the above been occurring?

less than 1 month _____ more than 1 month ____

(b) How soon after the experience did they begin to occur?

less than 6 month ____ more than 6 months ____

10. Do you deliberately avoid thoughts or feelings that remind you of the experience?

Yes____ No____

11. Do you deliberately avoid activities or situations that remind you of the experience?

Yes____ No____

12. Do you find that you have trouble remembering certain aspects of the experience?

Yes____ No____

13. Are you much less interested in things that used to be important to you (e.g., sports, hobbies, social activities)?

Yes____ No____

14. Do you feel distant and cut off from others?

Yes____ No____

15. Do you feel emotionally numb? (e.g., are you no longer able to feel strongly about things or have loving feelings for people?)

Yes____ No____

16. Do you feel pessimistic about your future?

Yes____ No____

In reference to questions 10 to 16, please answer the following:

(a) How long have any of the above been occurring?

less than 1 month _____ more than 1 month ____

(b) How soon after the experience did they begin to occur?

less than 6 month ____ more than 6 months ____

17. Do you have trouble sleeping?

Yes____ No____

18. Are you often irritable, or do you often have outbursts of anger?

Yes____ No____

19. Do you have trouble concentrating?

Yes____ No____

20. Are you watchful or on guard even when there is no reason to be?

Yes____ No____

21. Do you startle easily?

Yes____ No____

In reference to questions 17 to 21, please answer the following:

(a) How long have any of the above been occurring?
less than 1 month _____ more than 1 month ____

(b) How soon after the experience did they begin to occur?
less than 6 month ____ more than 6 months ____

Trauma Sequelae Questionnaire Scoring Criteria

Criterion A: The person must have reported the experiencing of a traumatic event outside the range of normal human functioning.

Criterion B: Re-experiencing the trauma. The person must answer yes to at least one of questions 1-9, and the duration of these symptoms must be at least one month.

Criterion C: Avoidance of stimuli associated with the trauma. The person must answer yes to at least three of questions 10-16, and the duration of these symptoms must be at least one month.

Criterion D: Increased arousal. The person must answer yes to at least two of questions 17-21, and the duration of these symptoms must be at least one month.

Criteria A, B, C, and D are necessary to categorize the person as PTSD positive. Sub-clinical PTSD is indicated when a person meets Criterion A plus any 2 of B, C, or D.

Section 5

Mediating Factors Questionnaire

Now I have some more questions about (city name). I understand that the weather here is very dry, so dry that it may be called a drought.

Threat Perception

01. Has the drought disrupted your daily living?
    (1) Very much
    (2) Moderately so
    (3) Somewhat
    (4) Not at all

02. Has the drought brought family problems?
    (1) Very much
    (2) Moderately so
    (3) Somewhat
    (4) Not at all

03. Has the drought brought financial problems?
    (1) Very much
    (2) Moderately so
    (3) Somewhat
    (4) Not at all

04. Do you see (perceive) the drought as a threat to you and your family?
    (1) Very much
    (2) Moderately so
    (3) Somewhat
    (4) Not at all

05. Who is responsible for the drought?
    (1) No one, it is natural occurrence
    (2) God
    (3) The Government
    (4) Others _____

06. Do you feel the drought will end soon?
(1) Yes, very soon
(2) No, it will take a long time
(3) I have no idea
(4) I am not worried about that
(5) Other _____

Coping

07. When you Think about the drought: (Drought area)
When you have a problem: (No-drought area)

Likert scale: (1) always
(2) frequently
(3) sometimes
(4) rarely
(5) never

1. Try to see the positive side.
2. Pray for guidance or strength.
3. Take things one step at a time.
4. Consider several alternatives for handling the problem
5. Draw on your past experiences; you were in similar situation before.
6. Prepare for the worst.
7. Try to reduce the tension by drinking more.
8. Do not worry about it; figure everything would probably work out fine.
9. Accept and get used to it.

Social Support

During the drought period: (Drought area)
When you have a problem: (No-drought area)

08. How <u>important</u> to you are each of the following kinds of social support, whether or not they are available to you:

<u>Instrumental support</u> (e.g., help doing things or getting things you need) (Check one)

(1) Very important
(2) Moderately important
(3) Somewhat important
(4) Not at all important

Emotional support (e.g., helping you feel better when things go wrong) (Check one)

(1) Very important
(2) Moderately important
(3) Somewhat important
(4) Not at all important

09. How available to you has been each kind of social support, whether or not you have chosen to use it:

Instrumental support (Check one)

(1) Very available
(2) Moderately available
(3) Somewhat available
(4) Not at all available

Emotional support (Check one)

(1) Very available
(2) Moderately available
(3) Somewhat available
(4) Not at all available

10. For each kind of support, how much have you actually used your sources of support:

Instrumental support (Check one)

(1) A great deal
(2) Moderately
(3) Somewhat
(4) Not at all

Emotional Support (Check one)

(1) A great deal
(2) Moderately
(3) Somewhat
(4) Not at all

11. For each kind of support, what are your main sources of support:

Instrumental support (Check all that apply)

(1) Family
(2) Friends
(3) Government
(4) Church
(5) Other (specify)

Emotional support (Check all that apply)

(1) Family
(2) Friends
(3) Government
(4) Church
(5) Other (specify)

12. If you were able to move somewhere else, away from (city name), how likely would you be to move (Check one):

(1) Very likely
(2) Moderately likely
(3) Somewhat likely
(4) Not at all likely

(If the answer to the previous question was "very likely," skip the next question.)

13. What would be the main reasons that you would not move (Check all that apply):

(1) Family ties
(2) Good job here
(3) The drought here is not a problem for me
(4) I am not sure my life would be much better somewhere else
(5) I was born here
(6) Other (specify)

Section 6

Demographic Questionnaire

01. Gender (1) male
(2) female

02. Site (1) Drought
(2) No-drought

03. Age

04. Marital status (1) Yes, we live together
(2) Yes, but we are living apart

05. Income (1) Up to 1 minimum wage
(2) 1 to 2 minimum wages
(3) 2 to 5 minimum wages
(4) more than 5 minimum wages
(5) without regular income
(6) Did not declare

06. Working Situation (1) Employed
(2) Unemployed
(3) Work at home
(4) Other (specify)

07. Education Level (1) Illiterate
(2) Up to junior-high
(3) up to high-school
(4) University incomplete
(5) University complete

08. Religion (1) Catholic
(2) Protestant
(3) No religion
(4) Other (specify)_____

09. Who lives in the household?

Relationship	Age
1._____	_____
2._____	_____
3._____	_____
4._____	_____
5._____	_____
6._____	_____
7._____	_____
8._____	_____

Cidade: _____
Residência nº.: _____
Sexo: _____

QUESTÕES INTRODUTÓRIAS

Appendix B

1. Você nasceu aqui ou veio de outra cidade para cá?

1. Nasceu aqui ( ) Sempre morou aqui? ( ) Sim Não ( )
2. Mudou-se para cá ( ) Origem: _____

2. Há quanto tempo você mora aqui? _____

1. Menos de 6 meses ( )
2. 6 meses a 1 ano ( )
3. 1 ano a 2 anos ( )
4. 2 anos a 5 anos ( )
5. 5 anos ou mais ( )

3. Você gosta de morar aqui?

1. De maneira nenhuma ( )
2. Um pouco ( )
3. Até certo ponto ( )
4. Muito ( )

4. Alguém de sua família mudou-se para outra cidade no Brasil, ou para outro país?

	Parentesco	Onde?
1.	_____	_____
2.	_____	_____
3.	_____	_____
4.	_____	_____

5. Você acha difícil morar aqui?

1. De maneira nenhuma ( )
2. Um pouco ( )
3. Até certo ponto ( )
4. Muito ( )

(Caso tenha respondido "De maneira nenhuma", pular a questão 6).

6. Na sua opinião, quais as condições que tornam a vida aqui difícil?

1. Gente demais ( )
2. Seca (escassez de chuva) ( )
3. Habitação inadequada ( )
4. Muito longe do hospital/médico ( )
5. Outros (especificar): _____

STAI - Parte I (Como você se sente agora, neste momento)
Spielberger, Gorsuch and Lushene, 1970

O(a) Sr(a). ...		Absolut. Não	Um Pouco	Bastante	Muitíssimo
1.	Sente-se calmo(a)	1	2	3	4
2.	Sente-se seguro(a)	1	2	3	4
3.	Está tenso(a)	1	2	3	4
4.	Está arrependido(a)	1	2	3	4
5.	Sente-se à vontade	1	2	3	4
6.	Sente-se perturbado(a)	1	2	3	4
7.	Está preocupado(a) com possíveis infortúnios	1	2	3	4
8.	Sente-se descansado(a)	1	2	3	4
9.	Sente-se ansioso(a)	1	2	3	4
10.	Sente-se "em casa"	1	2	3	4
11.	Sente-se confiante	1	2	3	4
12.	Sente-se nervoso(a)	1	2	3	4
13.	Está agitado(a)	1	2	3	4
14.	Sente-se uma pilha de nervos	1	2	3	4
15.	Está descontraído(a)	1	2	3	4
16.	Sente-se satisfeito(a)	1	2	3	4
17.	Está preocupado(a)	1	2	3	4
18.	Sente-se superexcitado(a) e confuso(a)	1	2	3	4
19.	Sente-se alegre	1	2	3	4
20.	Sente-se bem	1	2	3	4

STAI - Parte II (Como você geralmente se sente)

Spielberger, Gorsuch and Lushene, 1970

O(a) Sr(a). ...		Quase Nunca	As Vezes	Frequente-mente	Quase Sempre
1.	Sente-se bem	1	2	3	4
2.	Cansa-se facilmente	1	2	3	4
3.	Tem vontade de chorar	1	2	3	4
4.	Gostaria de poder ser tão feliz quanto os outros parecem ser	1	2	3	4
5.	Perde oportunidades porque não consegue tomar decisões rapidamente	1	2	3	4
6.	Sente-se descansado(a)	1	2	3	4
7.	É calmo(a), ponderado(a) e senhor(a) de si mesmo(a)	1	2	3	4
8.	Sente que as dificuldades estão se acumulando de tal forma que não as consegue resolver	1	2	3	4
9.	Preocupa-se demais com coisas sem importância	1	2	3	4
10.	É feliz	1	2	3	4
11.	Deixa-se afetar muito pelas coisas	1	2	3	4
12.	Não tem muita confiança em si mesmo(a)	1	2	3	4
13.	Sente-se seguro(a)	1	2	3	4
14.	Evita ter que enfrentar crises ou problemas	1	2	3	4
15.	Sente-se deprimido	1	2	3	4
16.	Está satisfeito(a)	1	2	3	4
17.	Às vezes idéias sem importância lhe entram na cabeça e ficam-lhe preocupando	1	2	3	4
18.	Leva os desapontamentos tão a sério que não consegue tirá-los da cabeça	1	2	3	4
19.	É uma pessoa estável	1	2	3	4
20.	Fica tenso(a) e perturbado(a) quando pensa em seus problemas do momento	1	2	3	4

Self Reporting Questionnaire - SRQ (20)

Harding et al., 1980

1) Tem dores de cabeça freqüentes?

( ) Sim ( ) Não

2) Tem falta de apetite?

( ) Sim ( ) Não

3) Dorme mal?

( ) Sim ( ) Não

4) Assusta-se com facilidade?

( ) Sim ( ) Não

5) Tem tremores na mão?

( ) Sim ( ) Não

6) Sente-se nervoso(a), tenso(a) ou preocupado(a)?

( ) Sim ( ) Não

7) Tem má digestão?

( ) Sim ( ) Não

8) Tem dificuldade de pensar com clareza?

( ) Sim ( ) Não

9) Tem se sentido triste ultimamente?

( ) Sim ( ) Não

10) Tem chorado mais do que de costume?

( ) Sim ( ) Não

11) Encontra dificuldades para realizar com satisfação suas atividades diárias?

( ) Sim ( ) Não

12) Tem dificuldades para tomar decisões?

( ) Sim ( ) Não

13) Tem dificuldades no serviço (seu trabalho é penoso, ou lhe causa sofrimento)?

( ) Sim ( ) Não

14) É incapaz de desempenhar um papel útil na vida?

( ) Sim ( ) Não

15) Tem perdido o interesse pelas coisas?

( ) Sim ( ) Não

16) Você se sente uma pessoa inútil, sem préstimo?

( ) Sim ( ) Não

17) Tem tido a idéia de acabar com a vida?

( ) Sim ( ) Não

18) Sente-se cansado(a) o tempo todo?

( ) Sim ( ) Não

19) Tem sensações desagradáveis no estômago?

( ) Sim ( ) Não

20) Você se cansa com facilidade?

( ) Sim ( ) Não

As pessoa às vezes passam por experiências que são extremamente marcantes e perturbadoras. Nós estamos interessados em conhecer um pouco mais sobre como estas experiências afetam as pessoas. Exemplos de tipos de experiências que estamos estudando:

a. Esteve envolvido em desastre de carro, incêndio, inundação ou seca;

b. Sofreu ameaça séria à sua vida ou à sua saúde, tais como, abuso físico ou sexual, assalto, doença com risco de vida ou foi seriamente ferido em um acidente;

c. Presenciou séria ameaça à vida ou à saúde de alguém próximo à você (ex.: assalto, suicidio);

d. Viu outra pessoa ser seriamente ferida ou morta;

Se você teve algum tipo destas experiências na sua vida, por favor fale de cada experiência, com uma breve descrição e dizendo a sua idade na época da experiência.

	EXPERIÊNCIA	IDADE
1.	_____	_____
2.	_____	_____
3.	_____	_____
4.	_____	_____

Se você listou mais de uma experiência, por favor, responda as questões seguintes a respeito da experiência mais traumática para você e, circule o número da experiência na lista acima.

1. Você tem lembranças angustiantes da experiência ocorrendo repetidamente e que interferem na sua vida?
( ) Sim ( ) Não

2. Você tem sonhos repetidos e angustiantes sobre essa experiência?
( ) Sim ( ) Não

3. Você tem tido a sensação de reviver esta experiência? (ex.: você agiu ou sentiu como se a experiência estivesse acontecendo? Inclua quaisquer experiências que aconteceram quando você está acordando ou quando você estava sob o efeito de bebida alcoólica)
( ) Sim ( ) Não

4. Você tem tido momentos súbitos de volta ao passado de forma involuntária? (isto é, momentos onde você reviveu as lembranças desta experiência)
( ) Sim ( ) Não

5. Você sofreu ilusões perceptivas? (ex.: percepções erradas, ou seja, você pensou ter visto na rua a pessoa que estava presente na experiência relatada, mas ao mesmo tempo compreende que não poderia ter sido aquela pessoa?)
( ) Sim ( ) Não

6. Você tem tido alucinações? (ouvir ou ver coisas que não existem?)
( ) Sim ( ) Não

7. Você se sente triste ou perturbado(a) quando algo o/a faz lembrar da experiência? (ex.: a data da experiência lhe deixa triste?)

( ) Sim ( ) Não

8. Você tem outros elementos simbólicos que o/a fazem lembrar desta experiência? (ex.: objetos, música, palavras ou frases que desencadeam memórias da experiência)

( ) Sim ( ) Não

9. Você tem alguma reação física a coisas que lhe lembram a experiência?

( ) Sim ( ) Não

Em relação às questões de 1 a 9, por favor, responda o seguinte:

a. Há quanto tempo algumas destas situações vêm acontecendo?
menos de 1 mês _____ mais de 1 mês _____

b. Quanto tempo após a experiência elas começaram a acontecer?
menos de 6 meses _____ mais de 6 meses _____

10. Você evita de propósito pensamentos ou sentimentos que o/a fazem lembrar da experiência?

( ) Sim ( ) Não

11. Você evita de propósito atividades ou situações que lhe lembram esta experiência?

( ) Sim ( ) Não

12. Você acha que tem dificuldades em lembrar de certos aspectos da experiência?

( ) Sim ( ) Não

13. Você está bem menos interessado(a) em coisas que costumavam ser importantes para você? (ex.: esportes, passatempo, atividades sociais)

( ) Sim ( ) Não

14. Voce se sente distante e afastado(a) das pessoas?

( ) Sim ( ) Não

15. Você se sente emocionalmente passivo(a)? (isto é, você não se sente mais fortemente atraído(a) por alguma coisa ou não demonstra mais amor pelas pessoas)

( ) Sim ( ) Não

16. Você se sente pessimista em relação ao futuro?

( ) Sim ( ) Não

Em relação às questões 10 a 16 responda, por favor, o seguinte:

a. Há quanto tempo algumas destas situações vêm ocorrendo?
menos de 1 mês _____ mais de 1 mês _____

b. Quanto tempo após a experiência elas começaram a acontecer?
menos de 6 meses _____ mais de 6 meses _____

17. Você tem problemas quando está dormindo?

( ) Sim ( ) Não

18. Você está sempre irritado(a), ou tem sempre acessos de raiva?
( ) Sim ( ) Não

19. Você tem dificuldade de se concentrar?
( ) Sim ( ) Não

20. Você está sempre em alerta ou na defensiva mesmo quando não há razão?
( ) Sim ( ) Não

21. Você se assusta com facilidade?
( ) Sim ( ) Não

Com relação às questões 17 a 21 reponda, por favor, o seguinte:

a. Há quanto tempo você tem algumas destas situações acontecendo?
menos de 1 mês _____ mais de 1 mês _____

b. Quanto tempo após a esperiência elas começaram a ocorrer?
menos de 6 meses _____ mais de 6 meses _____

Agora, temos mais algumas questões sobre sua cidade. Entendemos que o clima aqui é muito seco, tão seco que pode ser chamado de "seca".

PERCEPÇÃO DO PERIGO

1. A seca desorganizou seu dia a dia?

(Se aqui tivesse uma seca como a do sertão...)
1. Você acha que a seca desorganizaria o seu dia a dia?

1. Muito ( )
2. Até certo ponto ( )
3. Um pouco ( )
4. De maneira nenhuma ( )

2. A seca trouxe problemas para a sua família?

2. Você acha que a seca traria problemas para a sua família?

1. Muito ( )
2. Até certo ponto ( )
3. Um pouco ( )
4. De maneira nenhuma ( )

3. A seca trouxe problemas financeiros?

3. Você acha que a seca traria problemas financeiros?

1. Muito ( )
2. Até certo ponto ( )
3. Um pouco ( )
4. De maneira nenhuma ( )

4. Você vê a seca como uma ameaça para você e sua família?

4. Você veria a seca como uma ameaça para você e sua família?

1. Muito ( )
2. Até certo ponto ( )
3. Um pouco ( )
4. De maneira nenhuma ( )

5. Quem é o responsável pela seca?

1. Ninguém, é um fenômeno natural ( )
2. Deus ( )
3. O Governo ( )
4. Outros: _____ ( )

6. Você acha que a seca vai acabar logo?

1. Sim, logo ( )
2. Não, vai durar muito ( )
3. Não faço a menor idéia ( )
4. Não me preocupo com isso ( )
5. Outro: _____ ( )

7. Quando você pensa sobre a seca, você: (áreas de seca)
Quando você tem um problema, você: (áreas em que não há seca)

		Sempre	Frequente-mente	As Vezes	Raramente	Nunca
1.	Tenta ver o lado positivo	1	2	3	4	5
2.	Reza por proteção e força	1	2	3	4	5
3.	Considera uma coisa de cada vez	1	2	3	4	5
4.	Considera várias alternativas para solucionar o problema	1	2	3	4	5
5.	Baseia-se em suas experiências passadas; você esteve em situação semelhante	1	2	3	4	5
6.	Prepara-se para o pior	1	2	3	4	5
7.	Tenta reduzir a tensão bebendo mais	1	2	3	4	5
8.	Não se preocupa com isto; imagina que tudo sairá bem	1	2	3	4	5
9.	Aceita-o(a) e se acostuma com ele(a)	1	2	3	4	5

AJUDA SOCIAL

Durante o período de seca: (nas áreas de seca)
Quando você tem um problema: (nas áreas sem seca)

Ajuda material (ex.: ajudá-lo a realizar alguma coisa ou obter algo que você precisa)

Ajuda emocional (ex.: ajuda você a se sentir melhor quando tudo vai mal)

8. Que importância tem para você os estes tipos de ajuda social, estando as mesmas disponíveis ou não a você?

Ajuda material (escolha uma)
1. Muito importante ( )
2. Razoavelmente importante ( )
3. Pouco importante ( )
4. Nada importante ( )

Ajuda emocional (escolha uma)
1. Muito importante ( )
2. Razoavelmente importante ( )
3. Pouco importante ( )
4. Nada importante ( )

9. Quais destes tipos de ajuda social estiveram disponíveis a você quer você as tenha usado ou não?

Ajuda material (escolha uma)
1. Sempre disponível ( )
2. Freqüentemente disponível ( )
3. Pouco disponível ( )
4. De modo algum disponível ( )

Ajuda emocional (escolha uma)
1. Sempre disponível ( )
2. Freqüentemente disponível ( )
3. Pouco disponível ( )
4. De modo algum disponível ( )

10. Para cada tipo de ajuda social disponível a você, quanto você realmente tem usado?

Ajuda material (escolha uma)
1. Muito ( )
2. Moderadamente ( )
3. Pouco ( )
4. De forma alguma ( )

Ajuda emocional (escolha uma)
1. Muito ( )
2. Moderadamente ( )
3. Pouco ( )
4. De forma alguma ( )

11. Para cada tipo de ajuda social, quais as suas principais fontes de assistência?

Ajuda material (marque tudo que se aplica)
1. Família ( )
2. Amigos ( )
3. Governo ( )
4. Igreja ( )
5. Outros (especificar): _____

Ajuda emocional (marque tudo que se aplica)
1. Família ( )
2. Amigos ( )
3. Governo ( )
4. Igreja ( )
5. Outros (especificar): _____

12. Se você tivesse condições de mudar-se para longe desta cidade, que probabilidades existiriam?
1. Muito provável ( )
2. Razoavelmente provável ( )
3. Pouco provável ( )
4. Totalmente improvável ( )

(Se a resposta da pergunta anterior foi muito provável, pule a próxima questão)

13. Quais seriam as razões principais para que você não mudasse? (marque tudo que se aplica)
1. Laços de família ( )
2. Bom emprego ( )
3. A seca aqui não é um problema para mim ( )
4. Não estou certo(a) de que a vida seria melhor em outro lugar ( )
5. Nasci aqui ( )
6. Outros (especificar): _____

QUESTIONÁRIO DEMOGRÁFICO

1. Sexo: 1. Masculino ( )
   2. Feminino ( )

2. Localização 1. Seca ( )
   2. Não seca ( )

3. Idade: _____

4. Estado civil: 1. Sim, moramos juntos ( )
   2. Sim, mas moramos separados ( )

5. Renda Familiar 1. Até 1 salário mínimo ( )
   2. De 1 a 2 salários mínimos ( )
   3. De 2 a 5 salários mínimos ( )
   4. Mais de 5 salários mínimos ( )
   5. Sem rendimento ( )
   6. Sem declaração ( )

7. Situação trabalhista: 1. Trabalha ( ) _____
   2. Desempregado ( )
   3. Trabalha em casa ( )
   4. Outros (especificar): _____

8. Escolaridade: 1. Analfabeto ( )
   2. 1º. grau ( )
   3. 2º. grau ( )
   4. Curso universitário incompleto ( )
   5. Curso universitário completo ( )

9. Religião: 1. Católica ( )
   2. Protestante ( )
   3. Nenhuma religião ( )
   4. Outras (especificar): _____

10. Quem mora na casa?

	Parentesco	Idade
1.	_____	_____
2.	_____	_____
3.	_____	_____
4.	_____	_____
5.	_____	_____
6.	_____	_____
7.	_____	_____
8.	_____	_____