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UNIVERSITY OF OKLAHOMA

GRADUATE COLLEGE

**EFFECTS OF STRESS ON THE PSYCHOLOGICAL SYMPTOMS AND GENERAL
HEALTH OF RURAL PRIMARY CARE PATIENTS**

A Dissertation

SUBMITTED TO THE GRADUATE FACULTY

in partial fulfillment of the requirements for the

degree of

Doctor of Philosophy

By

**Philip William Brown
Norman, Oklahoma
1997**

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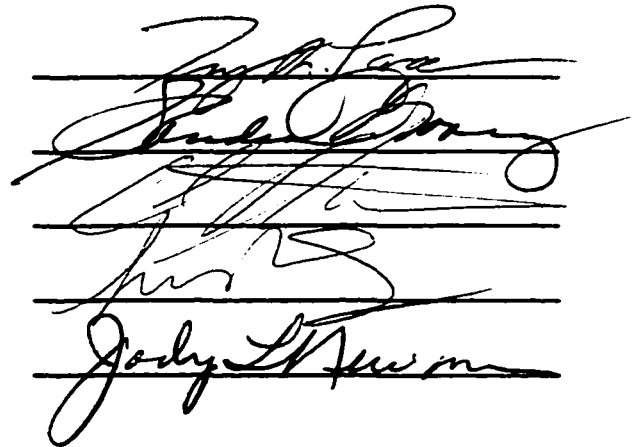
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**EFFECTS OF STRESS ON THE PSYCHOLOGICAL SYMPTOMS
AND GENERAL HEALTH OF RURAL PRIMARY CARE PATIENTS**

**A Dissertation APPROVED FOR THE
DEPARTMENT OF EDUCATIONAL PSYCHOLOGY**

BY

The block contains five handwritten signatures, each written over a horizontal line. From top to bottom, the signatures are: 1. A signature that appears to be 'Judy L. ...'. 2. A signature that appears to be 'Randy ...'. 3. A signature that appears to be 'J. ...'. 4. A signature that appears to be 'Judy L. ...'. 5. A signature that appears to be 'Judy L. ...'.

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No folks, absolutely none deserve more thanks from me than my parents and step-parents.
You have endured more than I could or would have ever asked of anyone.
I cannot express in words alone how much I love and appreciate you,
and I thank God that I was graced with you all.

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for your support, endless encouragement, and understanding.
You never questioned me, and you were there when I needed someone to listen.
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ABSTRACT

This study was designed to enhance our understanding of how the stress of rural life affects the mental and physical health of rural Americans. Fifty patients of a primary care medical facility in rural Oklahoma participated by completing a battery of instruments comprised of a measure of stress, the Rural Experiences Questionnaire; a measure of mental health, the Brief Symptom Inventory; a measure of physical health, the Duke-UNC Health Profile; and a demographic form. As a group, events deemed most unique to rural living produced the greatest relative stress. Results found the overall sample and, in particular, the female subsample to have psychological distress scores that were significantly elevated compared to nonpatient norms. The most prominent mental health symptoms were those indicative of somatization and obsessive-compulsive disorders. In terms of physical health, symptoms often noted as the first and perhaps only indicators of general health status were found to be the most problematic. Physical symptoms of health problems were also found to be elevated compared to available norms. Regressions revealed that stress predicted neither psychological distress nor general health status. Only obsessive-compulsive symptoms predicted physical health, and this prediction held true only for group results and for those derived from the female subgroup. Factors related to small sample size, age and medical service status of participants, techniques of instrument administration and participant selection, and the length of the assessment battery were among those having the strongest impact on interpretation of the findings and implications for future research.

**Effects of Stress on the Psychological Symptoms and General Health
of Rural Primary Care Patients**

It has long been known that much about rural life is very stressful (Smith, Culligan, & Hurrell, 1977), and yet, little is known with regard to how that stress affects the mental and general health of rural inhabitants (Walker & Walker, 1988a). Currently, the literature relevant to rural populations comes from the fields of rural sociology and rural health (Murray & Keller, 1991). That which pertains to rural mental health is limited (e.g., Flax, Wagenfeld, Ivens, & Weiss, 1979; Keller & Murray, 1982; Murray & Keller, 1986; National Mental Health Association, 1988; Wodarski, 1983) and has been slow to develop (Murray & Keller, 1991).

Such realities sparked the federal government, through the National Institute of Mental Health, to get directly involved in the collection of rural demographic and sociocultural data nearly three decades ago (Hutner & Windle, 1991). From the several small rural mental health research grants spawned by that endeavor, numerous findings pertaining to rural mental health care were proffered. For instance, it was revealed that rural America suffered from a dearth of treatment facilities and professionals trained to provide mental health care (President's Commission on Mental Health, 1978; Task Panel on Rural Mental Health, 1978). Also found was the inappropriateness of rural service delivery to the needs of rural people (Task Panel on Rural Mental Health, 1978). The research made it clear that rural dwellers were settled across vast expanses in densities much lower than their urban counterparts resulting in treatment service delivery to rural areas being more costly and less

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available and accessible (Bedics & Doelker, 1983; Human & Wasem, 1991).

Moreover, the mental health professionals who did venture into the countryside too often found themselves isolated from professional colleagues and in need of specialized training designed to help them more effectively address the distinctive needs of their rural clientele.

One might think that research on the mental health needs of rural folks has advanced well beyond that just discussed. The unfortunate reality is that it has not. Many have cited the need for programs designed to equip psychologists and psychiatrists alike with the skills needed to effectively and appropriately address the often unique issues presented by rural people (Hutner & Windle, 1991; National Institute of Mental Health [NIMH], 1986; Phillips & Murrell, 1994; Schneider, 1982; Task Panel on Rural Mental Health, 1978). Knowing that such programs cannot be designed unless more is known about the mental and physical needs of rural inhabitants, several authors have called for a greater focus by researchers on the quality of life and the role of stress in the psychological and physiological well-being of rural Americans.

This study was proposed to shed new light on the relationships of stress to the mental and physical health of rural dwellers. The literature on the various aspects of ruralness relevant to that endeavor was examined, and the succeeding review summarizes the most current information published to date.

Review of the Literature

Defining Rurality

Rural Americans and the land in which they live virtually defy characterization by brief description (Murray & Keller, 1991). Throughout the years, "ruralness" equated with notions of connections to agriculture, but such can no longer be the case, for agriculture-related pursuits are only a small part of what rural America is about (Olson & Schellenberg, 1986). The U.S. census of 1990 found that though 24.8% of Americans were considered rural, only 1.6% of those rural dwellers lived on farms (Facts on File, 1992). The percentage of rural inhabitants directly associated with agriculture has steadily decreased through the years, and it is quite likely that the trend will not reverse itself (Facts on File, 1981, 1992; Swanson, 1985). From another perspective, by the mid-1980s, about 29% of the nonmetropolitan counties in this country were farming dependent, while 28% depended on manufacturing. Interestingly, though, the farming dependent counties accounted for only 13% of the rural population. By contrast, 40% of the country's rural inhabitants resided in manufacturing dependent counties (Bender et al., 1985).

Many researchers have failed to provide a definition of rural in their studies. Of those who have, population criteria have been used by most, multidimensional definitions have been used by very few, and even fewer have relied on multiple quantitative criteria (Murray & Keller, 1991). The U.S. Bureau of the Census (1978) has provided what appears to be the most objective definition of rurality to date. The Bureau defined rural populations as the groups of people living in places or towns of

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less than 2,500 inhabitants and in open country outside the more densely settled suburbs of metropolitan cities. That which is considered metropolitan is based on the designation of metropolitan statistical areas (MSAs) which have a total population of at least 100,000 (75,000 in New England), comprise one or more central cities with at least 50,000 inhabitants, and include areas related to the central city both socially and economically (U.S. Bureau of the Census, 1989).

Thus, the distinction between rural and metropolitan seems rather clear. By contrast, however, a firm definition of rural is likely open to debate. Nonetheless, for the purposes of this study, people living outside metropolitan statistical areas were defined as rural inhabitants.

Rural Stress

Numerous theorists have postulated that stress is an effect of human-environment interactions (Lazarus & Folkman, 1984; Pervin, 1968; Taylor, 1986) with the amount experienced believed to be quite reliant on the individual's subjective appraisal of environmental demands or events known as stressors. Many agree, as well, that the effectiveness of one's coping strategies ultimately determines the intensity of the perceived distress or stress (Walker & Walker, 1987b).

A summary of the literature pertaining to rural stress, coping, and support delineated four aspects of rural life which appeared to significantly tax the resources of rural dwellers and made coping with stress particularly problematic. First was the finding that the geography of rural living often created isolation which precluded access to communities where health services, education facilities, other business

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opportunities, and entertainment could be readily attained. Second, there was too often a heavy reliance by too many inhabitants on one major industry. Third, the stresses associated with the dominant rural occupations like mining, fishing, ranching, and farming often presented unusual and unpredictable challenges to rural dwellers' coping abilities. Finally, the stage of business development, be it boom or bust, or changing demographics tested the abilities of even the most resourceful (Kenkel, 1986).

From all indications, the demographics of rural America have long been changing. The mean age of rural inhabitants has risen steadily due in large part to a steady migration of the relatively old and retired from metropolitan areas to rural regions (Sofranko, Fliegel, & Glasgow, 1983). The most current findings indicated that by the early 1990s, nearly 29% of the nation's elderly resided in rural areas (Human & Wasem, 1991). The implications of this are that the demand for health-related services are likely to become much more pronounced as those newcomers grow less able to care for themselves (see Scheidt, 1986).

Human and Wasem (1991) wrote about the stresses created by the cyclic boom-and-bust nature of rural economies. For instance, the 1970s were a boom period for the agriculture industry, but by the mid-1980s that boom had dissipated into a bust which was deepened by drought. The authors explained that the need for mental health services increases during both bust and boom periods. Boom periods are traditionally characterized by an unusually large influx of people to an area from other regions. Such migrations create additional stresses for rural residents and communities

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(see Lazarus & Folkman, 1984; Weisz, 1979) which, in turn, heighten mental health service demand. Booms too often are followed by economic downswings that spiral into bust periods. During such periods the need for health, mental health, and social services escalates, but land prices drop eroding the tax base which often finances those services. Rural communities caught in such a process then find themselves less able to provide needed services, and the stage is set for a vicious cycle to develop.

Certainly, a great deal has been written about other environmental demands which have faced America's rural inhabitants. Specifically, in the years between 1970 and 1990, the rural sector experienced a 35% decrease in the percentage of jobs classified under farming, forestry, and fishing (Facts on File, 1992). In 1978 it was estimated that 13.5% of all rural inhabitants were living in poverty. At the same time, 10.4% of the urban population lived below the poverty level (National Rural Center, 1981). In the 1970s, it was noted that the prevalence of rural malnutrition and infant mortality was greater than that found in urban areas (Copp, 1976). As well, unemployment rates among rural folks exceeded those found in urban areas (Jurich, Smith, & Polson, 1983; Nilsen, 1979). Almost two-thirds of all rural housing had inadequate plumbing (Mikesell, 1977), and nearly half of all occupied substandard housing was found in rural sections of the country (Bird & Kampe, 1977). By the mid-1980s, it seemed that little had improved. There were reports that, between the years of 1979 and 1984, nearly 50% of America's 2,040 nonmetropolitan counties experienced unemployment increases from five to nine percent or greater. From 1981 to 1985, nearly 500,000 American jobs were lost in farming and related industries.

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Furthermore, though just 25% of the U.S. population resided in rural areas, 38% of the country's poverty stricken were from rural communities. To make matters worse, reports indicated that 67% of the substandard housing found in this country was in rural areas (Bergland, 1988). It was estimated during the 1980s, as well, that the rate of uninsured rurals ran about 15% higher than the U.S. average. Moreover, Medicaid eligibility was less likely in that many rural folks were so poor that they had to continue working (National Association of Community Health Centers and National Rural Health Association [NACHC-NHRA], 1988). Rural areas have long been known to have a relatively low proportion of inhabitants who hold white-collar jobs. Additionally, in comparison to their urban counterparts, rural dwellers tend to have lower median educational attainment, smaller median family incomes, and lower percentages of men and women participating in the labor force (Watkins & Watkins, 1984).

The National Mental Health Association published a report in 1988 revealing rising rates of alcohol abuse among rural dwellers and an increasing prevalence of reported child and spouse abuse in rural areas. The report also noted that the rate of depression among rural youths was twice the national average, and between 1981 and 1986, the rate doubled in certain rural areas. Some researchers reported that investigations and confirmed cases of child abuse had increased by more than 30% in rural America (Reese, 1986; Wall, 1985). It seemed that suicide rates among rural people were also rising during the '80s. One study investigated a number of professions and found farming to have the highest suicide rate of all (Ritchie & Ristau,

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1986). Hoberman (1987) reported the rate of suicide in one rural sample to be 15 times greater than the national average.

Thus, it can be seen that stress has both subjective and environmental components. As well, studies show that rural living presents its inhabitants with a particular confluence of environmental factors which can severely strain their resources and coping strategies. What has not been shown, however, is what the literature has to say about how stress relates to specific physical and mental health problems or symptoms and how such relationships translate into primary care service utilization.

Rural Stress and Psychological and General Health

Very little has been written pertaining to the relationships between rural stress and the psychological and general health problems incurred by rural inhabitants (e.g., Donham & Mutel, 1982; Kenkel, 1986). Only two studies have attempted to predict the occurrence of mental health problems in rural participants due to environmental stress (Templeman, Condon, Starr, & Hazard, 1989; Walker & Walker, 1987b). Many such studies generally made rural and urban comparisons regarding the occurrence rates of stress-related problems (e.g., Flax et al., 1979; Wagenfeld, 1982). However, it has been noted that urban-rural comparisons regarding stress-related symptomatology should not be made without considerable reliable data. Several reviewers have cautioned that the evidence to make such comparisons has simply been unavailable (Flax et al., 1979; Kenkel, 1986; Wagenfeld, 1982). Regardless of the purpose, though, for which the study was designed, nearly all looked at a subgroup that

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accounted for only a small fraction of all rural people, farmers (e.g., Hertsgaard & Light, 1984; Joslin & Rosmann, 1986; Knudsen & Wilson, 1985; Walker & Walker, 1987a, 1988b; Weigel, 1981).

During the 1970s, epidemiologic studies found agriculture subgroups to have high rates of disability from chronic disease. Specifically, such groups were particularly afflicted by impairment of the back and spine, arthritis, heart disease, respiratory disease, and mental disorders (Donham & Mutel, 1982).

Walker and Walker (1988a) used a nonrandom sampling technique to study stress-related symptoms in 817 Canadian participants whose principal occupation was farming. Their results revealed that nearly 50% of the participants reported moderate to high occurrences of trouble relaxing, loss of temper, and chronic fatigue. Over 30% reported moderate to high frequencies of difficulty concentrating, back pain, sleep disruptions, avoiding decisions, increase in arguments, and weight gain or loss.

The researchers found self-reported symptom occurrences differed as a function of a number of demographic variables. For instance, significantly higher symptom scores were attained by women. Those over the age of 50 recorded fewer symptoms than those under that age. The scores of participants in mixed-grain and livestock operations were significantly elevated over those of their cohorts whose enterprise relied solely on grain farming. Off-farm employment also correlated positively with higher symptom reports. The farm participants' symptom levels were compared to nonfarm counterparts, and significantly higher symptom levels were found to occur in the former. The symptoms determined to best differentiate between

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the farm and urban groups included loss of temper, back pain, increased drinking, behavior problems in children, and forgetting things (Walker & Walker 1988a).

Several studies have specifically investigated the psychological problems related to stress in rural subgroups. Weigel (1981) asked a group of Iowa farm residents to complete self-report measures for assessing perceived reactions to stress. The reactions reported in descending order of occurrence were physical discomfort, emotional outbursts, inability to relax, mental confusion, depression-anxiety, excessive fatigue, and apathy. Another study found anxiety scores not to differ from norms for adult women (Hertsgaard & Light, 1984). However, the researchers did find the anxiety scores related to the degree of involvement in the decision-making processes pertaining to farm operations. Knudsen and Wilson (1985) surveyed Saskatchewan farmers and found 80% experienced stress-related symptoms. The symptoms most frequently reported were headaches, fatigue, and sleeplessness. As previously mentioned, NMHA (1988) found increased rates of alcohol abuse among rural dwellers, increasing rates of child and spouse abuse, rates of depression among rural youth that were nearly twice the national average, and a doubling of depression symptoms in certain rural areas between the years of 1981 and 1986.

In another report, Walker and Walker (1987b) attempted to delineate the occupational stressors of farm life predictive of distress levels in farmers. The investigators found the best predictor of symptoms for both men and women was "problems in balancing work and family responsibilities" (p. 377). For men, the major stressors, in descending order of importance, were problems in balancing work and

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family responsibilities, personal illness during planting or harvesting, conflict with spouse over spending priorities, no farm help or loss of help when needed, worrying about keeping the farm in the family, death of a friend, farming-related accident, having to travel long distances for service, surface rights negotiations, and machinery breakdown at a critical time. For the women, the most stressful events predictive of symptoms, again in descending order, were problems in balancing work and family responsibilities, conflict with spouse over spending priorities, pressures in having too much to do in too little time, government cheap food policies, major decisions being made without my knowledge or input, death of a friend, worry about owing money, feeling isolated on the farm, need to learn and adjust to new government regulations/policies, and concerns about the continued financial viability of the farm. The researchers performed two stepwise regressions on their data to determine the relative importance of various symptoms in predicting the total symptom scores for both men and women. The two groups shared four of the same predictors: trouble concentrating, sleep disruptions, change in health, and increase in arguments. For men, back pain was one of the top five predictors of total symptoms. One of the top five major predictors for women was losing their temper.

Through the years, there has been some speculation that women may have been more likely to bear the symptoms of stress in farm families. Joslin and Rosmann (1986) suggested the reasons for that could have been due to women often being the emotional leaders in family functions or to the excessive demands stemming from being forced to seek off-farm employment to help relieve financial pressures.

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In its development phase, the Rural Experiences Questionnaire (REQ; Templeman et al., 1989), was administered to 17 psychiatric outpatients and 29 male and female participants, the nontreatment comparison group, in a wellness workshop conducted by one of the instrument's developers. One of the hypotheses to be tested was, "the negative impact of recent life events as measured by the REQ should be positively correlated with admission levels of depression" (p. 44). Another of the hypotheses was, "rural events with negative impacts should also be associated with higher levels of anxiety and depression" (p. 44). The first hypothesis was modestly supported in that the REQ total score correlated positively with depression for the outpatient group. The latter hypothesis was not supported, but there was support for the possibility that positive rural experiences could, in fact, lessen the level of anxiety or depression experienced in an otherwise stressful environment.

Thus, having reviewed all the published research to date, it can be seen that few studies have looked at the prevalence of psychological or general health symptoms of stress in rural people. Studies which attempted to predict stress-related symptoms or which even tried to correlate frequencies of stress and stress-related symptoms are rare. Of the existing studies on stress and its symptoms in rural dwellers, research on farmers, a small subgroup of rural Americans as a whole, dominates the literature.

It was with the aforementioned shortcomings in mind that this exploratory study was proposed and undertaken. What made it exploratory were the following factors. First, this study was designed to enlist the participation of individuals who were more representative of rural Americans as a whole than were the participants of

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previous studies. Second, like previous studies, the nature of rural stress and psychological and general health symptoms were to be described. In addition, though, analyses were to be performed to determine how well certain global indicators of rural stress predicted either psychological well-being or general health status and whether general health was predicted by certain global indicators of psychological well-being. It was believed that accomplishing each of these tasks would advance our understanding of how stress impacts the lives of rural Americans. To provide the framework for this endeavor, the following research questions were formulated.

Research Questions

1. What is the nature of stress in this sample?
2. What is the nature of psychological symptoms of distress in this sample?
3. What is the nature of the general health of this sample?
4. Does psychological distress predict physical health in this sample?
5. Does rural stress predict psychological distress in this sample?
6. Does rural stress predict physical health in this sample?

It was determined that three predictor variables would be chosen for psychological distress and for rural stress. For psychological distress, those variables were the mean scores of the Brief Symptom Inventory (BSI) Global Severity Index (BSIGSI) and the Obsessive-Compulsive (BSIO-C) and Depression (BSIDEP) symptom dimensions. The three predictor variables for rural stress were the Rural Experiences Questionnaire's (REQ) absolute total score mean (REQTOT) and the Rural Events (REQRUR) and Financial Events (REQFIN) item category means. The

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criterion variable for physical health was the mean score of the Duke-UNC Health Profile Symptoms (DUHPSYM) dimension. For psychological distress, the criterion variable was the BSI Global Severity Index (BSIGSI) score mean. The reasoning behind choosing each of the various predictor and criterion variables will be discussed in the Results section of this report.

Method

Participants

All participants were gathered from the client population of a primary care facility, as agreed to by the owner/physician of that facility. The practice was located in a southwestern Oklahoma rural community of about 3,350 inhabitants (U.S. Bureau of the Census, 1993). When traveling by road, the town was more than 60 miles from the nearest metropolitan statistical area (see Appendix A). Fifty adults, both females and males, completed the battery of instruments used in this study, everyone had to meet two criteria to participate: 1) they had to be at least 18 years old, and 2) they had to have had an open chart for at least one year prior to the date they participated.

Measures

Participants were asked to complete four research instruments and an informed consent form. The four instruments were the Rural Experiences Questionnaire (REQ; Templeman et al., 1989), the Brief Symptom Inventory (BSI; Derogatis & Melisaratos, 1983; Derogatis & Spencer, 1982), the Duke-UNC Health Profile (DUHP; Parkerson et al., 1981), and a personal information questionnaire developed by the principal

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investigator and his faculty sponsor. Copies of the four instruments can be found in Appendix J, and a description of each follows.

Rural Experiences Questionnaire (REQ). The REQ is a self-report instrument designed to assess the impact of recent life events on rural people (Templeman et al., 1989). The format and content of the REQ are similar to that of the Life Experiences Survey (LES; Sarason, Johnson, & Siegel, 1978) after which it was designed. The REQ's 72 items were divided, according to consensus of its developers, into seven subscales and numbered sequentially by subscale. The items of each subscale assess a number of life experiences identified in the literature as rural events known to be stressful for most people (Templeman et al., 1989). The subscales are individually entitled "Work-Related Events," "Financial Events," "Living Conditions," "Family-Related Events," "Relationship Events," "Rural Events," and "Miscellaneous Events."

The number of "events" in each scale varies from seven to 16, but two subscales have at least one question with an "a" and "b" part. For instance, question 6 of the Work-Related Events subscale is stated in two slightly different ways. Question 6.a. inquires about the effect on the participant during the past year of a change in the wife's work outside the home and is intended to be answered only by a "Married Male" (Templeman et al., 1989, p. 53). Question 6.b. is stated so as to assess the impact of a change in the husband's work outside the home and is intended to be answered only by a "Married Female" (Templeman et al., 1989, p. 53). The Relationship Events subscale has two questions which each have an "a" or "b" part.

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Question 2.a. is for male respondents and asks about the impact of a wife or girlfriend becoming pregnant. Question 2.b. is for female respondents and assesses the degree to which becoming pregnant during the past year affected them. Question 3.a. asks males to note the affect on them of a their wife or girlfriend getting an abortion during the past year. Question 3.b. is to be answered by females only and inquires about the impact on the respondent of their own abortion during the past year. All subscales, except for Rural Events, offer the respondent a chance to note how some "Other" (Templeman et al., 1989, pp. 53 - 57) related event affected their life during the preceding year. The Miscellaneous Events category offers the participant the opportunity to list up to seven related events and to rate the impact of each.

Events are intended to be rated according to how negatively or positively they impacted the respondent's life during the past 12 months. Specifically, a -3 means the event was viewed as extremely negative (EN), -2 suggests a moderately negative (MN) impact, -1 indicates a slightly negative (SN) impact, and 0 means the event was experienced but was perceived as having no noticeable effect (NI). A rating of +1 suggests the event had a slightly positive (SP) impact on the participant, +2 means the event's impact was perceived as moderately positive (MP), and +3 is indicative of an extremely positive (EP) effect. If the event did not occur in the respondent's life during the past 12 months, then X for not applicable (NA) is to be circled (Templeman et al., 1989). Though the authors offered no indication of the amount of time it takes to complete the REQ, it is estimated to take no more than 15 minutes.

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Currently, only two studies report findings relative to the use of the REQ. The first of those two studies was performed by the instrument's developers. In its initial stages of development, Templeman et al. (1989) administered several versions of the REQ to hospitalized psychiatric patients. As the instrument's development reached its final phases, the researchers administered the aforementioned version to participants in a private psychiatric inpatient unit ($n = 50$), a state hospital psychiatric unit ($n = 17$), a private psychotherapy practice ($n = 12$), and to a nontreatment comparison group of 29 people considered to be part of the general public. All participants were from Oregon and women outnumbered men in all samples except the private practice in which men outnumbered women by more than three times. In addition to the REQ, Templeman and his associates administered a measure of depression, the Beck Depression Inventory (BDI; Beck, 1967), to all private hospital patients within 24 hours of admission, to all state hospital patients once they were stabilized on medication, and to all psychotherapy clients within the first two or three sessions. Additionally, a measure of anxiety, the State-Trait Anxiety Inventory (STAI; Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983), was administered to all patients and clients at the same time they were asked to complete the BDI. The researchers had hoped to evaluate the relationship of life stress to depression and anxiety by administering the REQ, the BDI, and the STAI to all but the nonpatient participants who served as controls.

In their results, Templeman et al. (1989) compared the total scores (apparently found by summing the absolute negative scale score and the positive scale score for each respondent) of participants from each of the four locations and found no

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significant main effect of gender ($F [1,104] = 2.78, p > .05$). However, interaction effects for gender by location were found ($F [3, 104] = 3.68, p < .05$) using a post hoc Scheffé's test which indicated that mean REQ totals for state hospital males were significantly higher than for their female cohorts ($t [104] = 3.36, p < .01$). It was noted, though, that the sample was quite small ($n = 17$) which enabled the extremely high scores of two of the male participants to skew the men's mean REQ total.

Templeman and his associates (1989) went on to perform analyses of variance for each subscale and the total score across locations. Significant differences ($p < .05$) were found for the Work-Related Events, Financial Events, Living Conditions, Rural Events, and Miscellaneous Events subscales as well as for the REQ total scores. Using Scheffé's test for post hoc comparisons to assess for between-group differences, several statistically significant ($p < .05$) findings were attained. Specifically, when comparing the subscale and total scores of the psychotherapy clients to the corresponding scores of the state hospital patients, statistically significant differences emerged for the Work-Related Events, Financial Events, and Rural Events subscales as well as for the REQ total scores. Comparisons of the nonpatient subscale and total scores to the corresponding scores of the state hospital patients also produced statistically significant differences for the Work-Related Events, Financial Events, Living Conditions, and Miscellaneous Events subscales and the REQ total score. In addition, significant differences were revealed when the nonpatient and state hospital patient Financial Events subscale scores were compared.

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Analyses were then undertaken to determine the strength of the relationships between the subscale items and the measures of anxiety and depression. Small, generally positive correlations were noted for each measure within the private hospital sample, but none were statistically significant. This led the researchers to conclude that negative rural events were not in themselves good predictors of presenting anxiety or depression in psychiatric patients. Despite these findings, the researchers did find the REQ total score to correlate positively with depression in the sample of private psychiatric hospital patients. However, within their sample of psychiatric patients (it was not reported whether these patients belonged to the private hospital sample, the state hospital sample, or if they were taken from the two combined) they discovered that nine of the men and seven of the women reported more positive than negative rural events in their lives. Thus this group was compared with the remainder of the sample who had not experienced a balance of positive rural events on measures of anxiety and depression. The results indicated that the positive rural sample generally presented with less state anxiety, $t(16) = -2.08, p < .05$, and depression, $t(16) = -2.13, p < .05$. The differences between the two groups showed clinical significance, as well, in that the positive responders produced moderately elevated scores related to anxiety and depression on the STAI and BDI, respectively. On the other hand, the anxiety and depression scores on the STAI and BDI for the negative responders were in the severe ranges. The clinically significant results could not be explained by the effects of gender, as a 2 x 2 ANOVA with gender and the rural events groups yielded no significant differences for either the STAI or the BDI (Templeman et al., 1989).

The second study pertaining to the REQ was designed to look at the reliability and validity of the instrument. Brown and Pace (1996) reported their results based on 41 completed administrations of a battery consisting of the REQ and LES. The researchers' participants ranged in age from 20 to 89 years. Twenty-nine of their participants were female; the remaining 12 were male. All of the participants were patients of a rural primary care clinic located in a town with a population of about 3,500 people in southwestern Oklahoma. The REQ was administered in its original format with all category headings printed and items numbered sequentially by category. The only difference between the REQ administered by the researchers and the format proposed by Templeman et al. (1989) was that respondents were allowed only two "Other" responses for the final subscale, Miscellaneous Events.

Brown and Pace (1996) performed analyses to determine the correlations between the positive change score, the negative change score, and the total change score (the sum of the positive change score and the absolute negative change score) for the REQ and LES. The researchers used SAS to make the desired determinations and found the Pearson correlation coefficient to be statistically significant for each paired comparison. The correlations and levels of significance for the positive change score, the negative change score, and the total change score comparisons were $r = 0.64, p < .001$; $r = 0.68, p < .001$; and $r = 0.67, p < .001$, respectively. The Cronbach coefficient alpha was computed for each instrument, as well, and an internal consistency coefficient of 0.82 emerged for both the REQ and LES. The researchers concluded that the concurrent validity and internal consistency of the REQ were both good.

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With the previously reviewed findings pertaining to the REQ and rural stress in mind, it was decided that, for the purposes of this study, the REQ would be modified somewhat (see Appendix J). The primary goals of the modification process were to upgrade the instrument so as to eliminate ambiguity in the instructions and questions and to broaden the stressors for which it assessed. To do this, some changes in the instructions were made. For instance, the original version of the REQ instructed the participant that, "A rating of 0 suggests no impact either positive or negative." This sentence was changed to read, "A rating of 0 would indicate that you experienced the event but that its effect on you was neutral." Other minor changes in the instructions were made, as well, with the goal, as previously stated, being the elimination of ambiguity. All subscale headings were eliminated and the items were numbered sequentially from beginning to end, for it was suspected that the inclusion of headings could influence item response. As well, the headings for the individual ratings were dropped, and a new set of such headings were inserted. Specifically, all negative ratings were listed under the heading of "Negative Effect." Similarly, all positive ratings had a heading of "Positive Effect." All "0" ratings were listed under the heading of "Neutral Effect," and the "X" which was originally to be circled if the event was "not applicable (NA)" received a heading of "Did Not Happen." All but one "other" item was eliminated; the one "other" item left was the last question. Nine items reflecting previous findings about rural stressors were added, and the "a" and "b" parts of all two-part questions were eliminated and listed as individually numbered items. Therefore, the version of the REQ presented to the participants of this study

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included 80 items, altogether. The original dollar amounts associated with questions about borrowing money were increased to levels believed to be more appropriate for the '90s. Finally, the wording of the second Miscellaneous Event's item was changed from "incarcerated in jail" to "arrested and put in jail (item 74). Completion time was still estimated to be no more than 15 minutes.

Brief Symptom Inventory (BSI). The BSI is a self-report, 53-item measure that can be used with individuals who have a minimum of a sixth-grade reading level (Boulet & Boss, 1991). It takes about 10 minutes to complete with one or two of those minutes typically allotted for administrative instructions (Derogatis & Melisaratos, 1983). It was designed to reflect the point-in-time psychological symptom status of psychiatric and medical patients, as well as, individuals who have not been assigned patient status. The BSI may be utilized repeatedly either to document trends through time or in pre-post evaluations (Derogatis & Spencer, 1982). It has been applied successfully with a broad range of individuals such as formal psychiatric patients, prison populations, patients with drug and alcohol problems, and individuals with sexual dysfunctions. In medical contexts it has been used to validly assess general medical patients, patients with cardiovascular disorders, chronic pain patients, cancer patients, and individuals with a number of other dysfunctions and complaints (Derogatis & Spencer, 1982).

Essentially, the BSI is the brief form of the SCL-90-R (Derogatis, 1977, Derogatis & Cleary, 1977a, 1977b; Derogatis, Rickels, & Rock, 1976). It comprises nine symptom dimensions, three global indices of distress, and one additional scale.

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The additional scale is made up of the four items not subsumed by any of the primary symptom dimensions, because each item “loaded” on several dimensions in a fashion that was not unique to any one dimension. The four items were retained because they were seen as representing important vegetative and other clinical indicators (Derogatis & Melisaratos, 1983). Hence, the four items are not scored collectively as a subscale, but the score of each does contribute to the BSI global scores (Derogatis, 1975). The BSI’s nine dimensions are Somatization (SOM), Obsessive-Compulsive (O-C), Interpersonal Sensitivity (INT), Depression (DEP), Anxiety (ANX), Hostility (HOS), Phobic Anxiety (PHOB), Paranoid Ideation (PAR), and Psychoticism (PSY). The three global indices, Global Severity Index (GSI), Positive Symptom Distress Index (PSDI), and Positive Symptom Total (PST), are included with the intention of providing more flexibility in overall assessment of the patient’s psychopathologic status (Derogatis & Spencer, 1982).

As proposed by Derogatis and Spencer (1982), each of the nine primary symptom dimensions is intended to reflect the distress arising from a distinct problem area. The SOM dimension comprises seven symptoms which together yield some measure of the distress arising from perceptions of bodily dysfunction. Particular attention is given to cardiovascular, gastrointestinal, and respiratory complaints, but other systems with strong autonomic mediation, pain and discomfort of the gross musculature, and additional somatic equivalents of anxiety are included as well. The O-C dimension reflects symptoms often identified with obsessive-compulsive disorder. The six items of this measure focus on thoughts, impulses, and actions that are

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experienced as unremitting and irresistible by the individual but are of an unwanted nature. In addition, this dimension's items assess behaviors and experiences associated with a more general cognitive performance deficit. The four items of the INT dimension center on feelings of personal inadequacy and inferiority in comparison to others. Individuals who score high on this dimension generally report acute self-consciousness stemming from and negative expectations related to their interpersonal communications and behaviors. There are six problems/complaints comprising the DEP dimension. These items are intended to reflect a representative range of criteria indicative of clinical depression such as dysphoric mood and affect, signs of withdrawal, lack of motivation, feelings of hopelessness, suicidal ideation, and other cognitive and somatic concerns. The six items of the ANX dimension are representative of symptoms or signs of clinically high levels of manifest anxiety. These include nervousness and tension, panic attacks, feelings of terror, cognitive components involving feelings of apprehension, and some somatic correlates of anxiety. The HOS dimension uses five items to tap thoughts, feelings, or actions generally believed to be characteristic of the negative affect state of anger. These items look at such manifestations by reflecting qualities such as aggression, irritability, rage, and resentment. The five items in the PHOB dimension are intended to reflect manifestations of the particular type of fear most closely associated with the classical definition of "agoraphobia" (Marks, 1969), also labeled "phobic-anxiety-depersonalization syndrome" by Roth (1959). As it pertains to the BSI, phobic anxiety is defined as "a persistent fear response to a specific person, place, object or situation

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which is characterized as being irrational and disproportionate to the stimulus, and which leads to avoidance or escape behavior” (Derogatis & Spencer, 1982, p. 14). Accordingly, the items of the dimension focus on the more pathognomonic and disruptive manifestations of phobic behavior. The five items of the PAR dimension are oriented toward representing paranoid behavior as a disordered mode of thinking. Thus, the cardinal characteristics of projective thought, hostility, suspiciousness, grandiosity, centrality, fear of losing one’s autonomy, and delusions are all represented in the items of this dimension. Finally, the PSY dimension was developed to represent the full symptom spectrum often associated with a diagnosis of psychosis ranging from mild interpersonal alienation to dramatic evidence of psychosis. The five items of this dimension were seen as indicative of a withdrawn, isolated, schizoid lifestyle and of symptoms of schizophrenia such as thought control.

The three global indices of distress associated with the BSI are intended to function as measures which communicate in a single score the level or depth of symptomatic distress currently experienced by the individual (Derogatis & Melisaratos, 1983). The GSI is purported as being the single best indicator of current distress levels, as it combines information on the number of symptoms and the intensity of perceived distress. It is recommended that the GSI be used in most instances requiring a single summary measure. The PSDI was designed to measure response style; it gives some indication of whether patients are augmenting or attenuating distress in their manner of reporting. The PST is simply a count of the number of symptoms the patient reports to have experienced to any degree. Thus, the

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PSDI and the PST are used as adjuncts to the GSI score in yielding a more meaningful understanding of a respondent's clinical status (Derogatis & Melisaratos, 1983).

The instructions inform whoever is being readied to take the BSI that they are preparing to look at a list of problems and complaints that people sometimes have. Having read each item carefully, the patient is asked to fill in one of the numbered circles to the right of the item which best describes how much discomfort that problem/complaint caused the individual during the past week including the present day. The term "number" is defined by the standard descriptor phrases printed above the rows of numbers from 0 to 4 appearing alongside each problem/complaint. The descriptor phrases and associated number of each are "not at all" (0), "a little bit" (1), "moderately" (2), "quite a bit" (3), and "extremely" (4). Once the items are completed, 12 sums of item scores corresponding to the nine dimensions and three global indices must be computed, and 11 of these must be divided by the corresponding number of items assigned to each (Derogatis & Spencer, 1982). The results can then be compared to norms for a sample of 1002 heterogeneous adult psychiatric out-patients, a sample of 719 nonpatient normal participants, a sample of 423 adult psychiatric inpatients, or 2,408 adolescent nonpatients. Female, male, and group norms for each are presented (Derogatis, 1993).

In developing the BSI, Derogatis and Spencer (1982) established the internal consistency reliability with a sample of 719 psychiatric outpatients using Cronbach's coefficient alpha (α). They found the alpha coefficients for all nine dimensions to be very good as they ranged from a high of .85 for the DEP dimension to a low on the

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PSY dimension of .71. Another study designed to check the internal consistency of the BSI using Cronbach's coefficient alpha also produced similar results. Boulet and Boss (1991) used the BSI as part of a larger assessment package to study a sample of 350 consecutive outpatients and 151 consecutive inpatients at the forensic service of a psychiatric hospital. All of the participants had purportedly been involved in some form of deviant sexual activity that required psychiatric assessment and possible treatment, but not all of them had outstanding criminal charges. Boulet and Boss reported the alpha coefficients to range from a high of .89 on the DEP dimension to a low of .75 on the PSY dimension. In another study the BSI was administered at intake to 231 women and 112 men in a counseling center at a large Southeastern university (Broday & Mason, 1991). Again, Cronbach's coefficient alpha was used to calculate the internal consistency for each of the nine symptom scales. These findings were also similar to those of the two aforementioned studies with an alphas ranging from .88 on the DEP dimension down to .70 on both the PSY and the PHOB dimensions.

The test-retest reliability of the BSI was expected by Derogatis and Spencer (1982) to be quite high. Their reasoning was that psychopathology is neither a "highly trait-mediated enduring characteristic" (p. 22) nor is it a "rapidly fluctuating 'state' manifestation" (p. 22). Thus, they explained, established symptoms should tend to endure for moderate to substantial periods of time if left untreated. Ergo, a test measuring psychopathologic manifestation should register high test-retest coefficients over a period of two weeks. Using a sample of 60 nonpatient individuals and testing them across a two-week interval, the BSI developers found the test-retest coefficients

to be exactly as they speculated. For the nine dimensions, the test-retest coefficients ranged from a low on the SOM dimension of .68 to a high of .91 on the PHOB dimension. Test-retest coefficients for the Global Indices were .90 for the GSI, .87 for the PSDI, and .80 for the PST. The authors concluded that these findings gave strong evidence that the BSI is a consistent measure across time.

Alternate forms reliability was evaluated using the SCL-90-R as the "alternate form." Derogatis and Spencer (1982) admitted that the SCL-90-R is not, in the strictest sense, a different form of the BSI. But since the BSI was directly derived from the SCL-90-R, the BSI's developers argued that the two tests measure identical symptom constructs. Ergo, correlations for the nine primary symptom dimensions shared between the two instruments were generated. Based upon a sample of 565 psychiatric outpatients, the correlations proved to be very high with the lowest occurring for the PSY dimension (.92) and the highest found for the HOS dimension (.99). These findings led to the conclusion that, at least for psychiatric outpatients, the two forms measure the same symptom constructs.

The convergent validity of the BSI was determined using data from a previous study which compared the BSI scores of 209 symptomatic volunteers to their corresponding SCL-90-R and MMPI scores (Derogatis et al., 1976). Since the BSI's 53 items are contained within the SCL-90-R, the data set was reanalyzed, scoring for the BSI instead of the SCL-90-R. The reanalysis revealed, by report, excellent convergence, though in some instances the overall magnitude of the correlation for several of the dimensions was somewhat lower than those found in the earlier

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convergence study of the SCL-90-R and the MMPI. The coefficients between the nine dimensions of the BSI and the clinical scales of the MMPI (Dahlstrom, 1969), the Wiggins Content Scales of the MMPI (Wiggins, 1966), and the Tryon Cluster Scores (Tryon, 1966) were calculated and reported. Seven of the dimensions (Interpersonal Sensitivity, Depression, Anxiety, Hostility, Phobic Anxiety, Paranoid Ideation, Psychoticism) yielded correlations with MMPI scales of a magnitude viewed as evidence of clear convergence. The magnitude of the correlation coefficient for each of the former three dimensions were almost identical to those in the SCL-90-R study, but as for the latter four dimensions, the magnitudes were reduced by about 0.10. In the cases of the Somatization and Obsessive-Compulsive dimensions, the patterns of correlations were retained, but the magnitudes of coefficients decreased by approximately 0.15. The researchers surmised that items deleted from the SCL-90-R in making the BSI dimensions almost certainly reflected some loss of reliability associated with shortening the scales, though patterns of convergence remained clearly evident (Derogatis & Melisaratos, 1983).

Less optimistic findings relative to convergent validity were reported by Boulet and Boss (1991) who also compared the nine BSI dimensions to the MMPI clinical scales. The two researchers reported only moderate correlations between the DEP dimension and the MMPI Depression scale ($r = .50$), the PAR dimension and the MMPI Paranoia scale ($r = .51$), the SOM dimension and the MMPI Hypochondriasis scale ($r = .53$), and the PSY dimension and the MMPI Schizophrenia scale ($r = .51$). What was troubling to the researchers was that each of the BSI dimensions correlated

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significantly with each of the MMPI clinical scales except for the MMPI Masculinity-Femininity scale. Furthermore, most BSI dimensions showed meaningful correlations with unrelated MMPI measured traits. These findings led Boulet and Boss to deduce that the correlations they found demonstrated convergent validity for some BSI dimensions and also suggested a low degree of discriminant validity. This conclusion was spawned by the observation that the intercorrelations among the nine BSI dimensions ranged from a low of .55 to a high of .80 which was indicative of significant nonindependence of the scales. Additionally, there were notable correlations between the nine BSI dimension scores and its total score (a range from $r = .73$ to $.91$).

Boulet and Boss (1991) found other problems with the BSI as well. Employing a principal-components analysis of the dimension scores to assess the independence of the subscales, an extraction criterion of eigenvalues of greater than or equal to one was used to determine the number of components to retain. It was found that one derived component accounted for 71% of the variance among score totals; the second principal component had an eigenvalue of .53 and accounted for only 5.9% of the variance. Thus, the authors concluded that given their sample, little information would be gained by separating the test scores into nine dimensions of psychopathology and that perhaps the degree but not the precise nature of psychopathology may be measured by the BSI.

An issue critical to the question of construct validation is that of internal structure. To assess the reproducibility of the internal structure of the BSI, the scores of 1002 psychiatric outpatients were subjected to a principal components analysis

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using a correlation matrix (Derogatis & Melisaratos, 1983). The BSI's developers analyzed a 49 x 49 correlational matrix omitting the four items that were not hypothesized to have particularly large loadings on any of the the instrument's nine primary dimensions. The results of the analyses, as reported by Derogatis & Melisaratos, were that there are certain minor differences between the empirical factor structure and the dimensional structure rationally hypothesized for the BSI. However, there was apparently more agreement than disagreement between the two, as seven of the nine hypothesized symptom constructs were reproduced with little or no disjuncture of items; the eighth dimension (General Anxiety) split into two well-defined clinical component dimensions. The ninth dimension (Interpersonal Sensitivity) did not stay together as a linear combination, but it was believed that the set of only four items defining the dimension may have been too small to ensure invariance. In all, it was concluded that the results from the structure-comparing factor analysis lent strong additional weight to the construct validity of the BSI.

Internal structure was also examined by Boulet and Boss (1991). Their findings revealed that very few dimensions were unambiguously defined by their subscale elements. Of the 49 BSI items, only 29 displayed peak correlations with the appropriate subscale score. On only the DEP dimension did all scale items show the highest correlation with the total scale score for which they were intended. Matters were further complicated when magnitudes of the correlations were taken into account. An item was defined as appropriate for a dimension if it displayed a correlation with the proper dimension that was equal to or greater than .10 of that item's correlation

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with any of the other eight dimensions. With such criteria as a basis, only seven of the 49 items could be classified as characteristic of the assigned dimension.

There is one study which has examined the convergent validity for the BSI Depression dimension (Stukenberg, Dura, & Kiecolt-Glaser, 1990). The researchers used the Hamilton Depression Rating Scale (HDRS; Hamilton, 1967) and the short form of the Beck Depression Inventory, a 13-item subset of the original instrument (Beck & Beck, 1972) for their comparisons. The two instruments and the DEP dimension of the BSI were administered to 59 male and 118 female community-dwelling adults, all over the age of 55. The correlation between the BDI short form and the BSI Depression dimension was .71 ($p < .0001$; $n = 145$). The DEP dimension correlation with the HDRS was .60 ($p < .0001$; $n = 177$). The BDI correlated .68 ($p < .0001$; $n = 146$) with the HDRS. It was concluded, given these findings, that the BDI short form and the BSI Depression dimension were comparable to the HDRS in their ability to screen for cases of depression in an elderly, community-dwelling sample.

A study to determine the predictive validity of the BSI was undertaken by a group of researchers in the mid- to late-1980s (Zabora, Smith-Wilson, Fetting, & Enterline, 1990). Thirty newly diagnosed cancer patients were recruited from the New Patient Clinic of the outpatient medical oncology department of a major university in the eastern United States. High-distress cancer patients were identified by screening instruments developed through the Omega Project (Weisman, Worden, & Sobel, 1980). The participants were asked to complete the Screening Instrument (SI) and the Inventory of Current Concerns (ICC), two of the Omega Project components, and the

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BSI during their initial clinic visit. Since nine of the original participants died prior to follow up, the remaining 21 were contacted nine to 12 months later and asked to complete follow-up instruments. Of that group, 19 consented to the request and completed the Profile of Mood States (POMS; McNair & Lorr, 1964) and the Psychosocial Adjustment to Illness Scale-Self Report (PAIS; Derogatis & Spencer, 1984). The overall Omega score was cross-tabulated with the GSI of the BSI utilizing the Kendall rank correlation coefficient (τ) (Siegel, 1956) and was found to equal .624 where $p < .0002$. To further determine the agreement between these instruments, the issue of "caseness" was examined by performing a Kappa analysis (Fleiss, 1981), and the observed agreement between the Omega instruments and the BSI was high at .833. The findings from the Profile of Mood States subscale of the POMS and from the Psychosocial Adjustment to Illness Scale subscale of the PAIS were used to determine the BSI's ability to identify future cases. A positive case was defined by a positive result on the POMS or the PAIS, and a negative case had to have scored a negative result on both instruments. The Kappa analysis for this determination yielded a score of .650 where $Z = 2.85$ ($p < .01$). Both the BSI and Omega correctly identified 16 of 19 (84.2%) cases. Employing confidence intervals, Zabora et al. determined that 95% of the time the true proportion of correct predictions by the BSI should be greater than 70%.

Looking at the extent to which various response sets might affect scores on the dimensions has been examined by checking the correlations between the BSI subscale scores and the L , F , and K scales of the MMPI (Boulet & Boss, 1991). The findings

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revealed that the BSI dimensions and the GSI global index correlated significantly with the *F* and *K* scales of the MMPI. This indicated that defensive individuals tended to obtain lower scores on the nine dimensions. Those who were predisposed to exaggerating their psychopathological symptomatology, as measured by the *F* scale of the MMPI, tended to obtain higher scores on a number of BSI dimensions. These findings led to the conclusion that the BSI dimensions are partially reactive to various response sets common to psychiatric patients.

Cautionary findings pertaining to how BSI scores can be interpreted are also found in the literature. Hale and Cochran (1992) utilized data attained from a larger cross-sectional study in which 841 alumni of a small, Southern university participated by completing questionnaires that dealt with health and aging. The sample was divided into four age cohorts of ages 21 to 34 years, 35 to 49 years, 50 to 64 years, and 65 years and older. All respondents completed the BSI, and the researchers then used an analysis of variance to compare mean PST (one of the three BSI global indices) scores of men and women in the four age groups. No relationship was found between age and distress for self-reported psychopathology. However, their findings did seem to suggest that young adults are more likely to report distress of a primarily psychological nature, while older adults are more likely to report distress associated with somatic and memory-related concerns.

Given all the aforementioned findings, it appears that the BSI is a well-developed instrument for the purposes of research, though for clinical concerns, its use may be somewhat questionable. Studies have shown it to be internally consistent and

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to possess good test-retest reliability. Its alternate forms reliability is good if one accepts the explanation of its developers that the SCL-90-R is truly an alternate form of the BSI. Findings regarding the BSI's convergent validity are mixed with at least some of the dimensions showing good convergent validity while most have only moderate convergent validity. Some researchers have raised questions about the instrument's construct and discriminant validities, while others have shown that there does seem to be some promise of the BSI's ability to predict future distress. Some results have suggested that the BSI may be a better measure of the degree of psychopathology as opposed to the precise nature of it, and there seems to be a possibility that the dimensions may be reactive to response sets common to psychiatric patients. Furthermore, researchers using the BSI should be aware that the types of distress actually being reported by participants may vary with age.

Duke-UNC Health Profile (DUHP). The DUHP is a 63-item instrument designed to measure adult health status in the primary care setting. Its developers intended it to be suitable both for research and for day-to-day clinical assessment (Parkerson et al., 1981). The profile is intended to be used with adults aged 18 years or older. It can be self-administered by those with at least a ninth-grade education or it can be easily administered by the interviewer. The instrument can be scored by hand or machine. Completion time is about 10 minutes if self-administered or 20 to 30 minutes if interviewer administered (Duke-UNC Health Profile Project, 1979).

The DUHP measures health status along four dimensions. The first of these, Symptom status (26 items), is known to overlap with the other areas, but because of its

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importance in primary care, it was conceptualized as a separate dimension. The reasoning was that symptoms are often the earliest if not the only manifestation of altered health, and the number and severity of symptoms provide an indicator of general health status. Furthermore, since patients often present with one or more symptoms which influence selection of diagnostic studies and subsequent treatment, knowledge of symptoms is particularly important to the measurement of outcome in the medical care setting. The second dimension, Physical functioning, comprises nine items. This scale measures an individual's perceived capacity to perform tasks rather than requiring a report of actual performance and uses three distinct components to accomplish this task: disability days (confinement to home or bed), ambulation, and use of the upper extremities. Disability days, a traditional measure of a person's response to illness, assesses the number of days during the past week the patient/participant had to stay in the house or was confined to bed most of the day because of sickness, injury, or health problems. The ambulation items were conceived on a scale ranging from perceived inability to walk to the bathroom to running the length of a football field to running five miles. The use of upper extremities simply inquires about whether the patient experienced trouble during the day performing such tasks as peeling an apple or combing one's own hair. The third dimension, Emotional functioning (23 items), examines the respondent's level of self-esteem, defined generally as a liking and respect for oneself and the belief in one's ability to get along with people. Self-esteem was chosen by the instrument's developers due to its theoretical underpinnings which posit it as a good indicator of emotional functioning

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based on the presumed importance of ego strength to emotional well-being. As such, it serves as a measure of self-perceived interpersonal competence believed to be helpful to researchers and providers in assessing the impact of primary care on the patient's emotional health. The final dimension, Social functioning (five items), looks at a person's ability to perform common societal roles and is assessed in four areas: self-care, ability to function in the workplace or at home, interactions with people, and participation in community and social events. The DUHP's developers recognized the potential for self-care to overlap with other health dimensions and acknowledged that some health status instruments associate it with physical function. However, they expressed their belief that "self-care reflects the most basic form of social role performance: a person who is unable to care for himself or herself not only is impaired socially, but also is likely to place more demands upon society than the physically impaired person who is still able to perform self-care" (Parkerson et al., 1981, p. 809).

DUHP items are scored using values ranging from 0 to 2 or 0 to 4. The score is calculated by summing the raw item values within each dimension and dividing by the maximum possible score for that dimension. This produces a score expressed as a proportion ranging from 0.00 to 1.00. Each item receives equal weight in the scoring within its respective health status dimension, so the higher the score, the better the functioning; the lower the score, the poorer the functioning (Parkerson, et al., 1981). A protocol for scoring missing data is thoroughly outlined in the scoring instructions (Duke-UNC Health Profile Project, 1979).

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The study group used for the instrument's development comprised 395 patients of a large primary care, fee-for-service, group practice in Durham, North Carolina. Of the study population, 40% ranged in age from 18 to 29 years, 25% were within the range of 30 to 39 years, 13% were between the ages of 40 to 49 years inclusive, 15% fell within the range of 50 to 64 years old, and 7% were 65 years of age or older. Twenty-three percent of the group were African American, 77% were Caucasian, 25% were male, and 75% were female. Most of the group had no more than a high school education (56%), and 66% were employed. Sixty-four percent of the group members were married, 17% were single, 12% were listed as separated/divorced, and 7% were widowed. The mean scores on the four dimension for the study group were .84 on Symptom status (range = .40 to 1.00), .72 on Physical functioning (range = .06 to 1.00), .77 on Emotional functioning (range = .22 to 1.00), and .74 on Social functioning (range = .10 to 1.00) (Parkerson et al., 1981).

Using the study group just presented, Parkerson et al. (1981) calculated one or more of three approaches used to establish reliability of the DUHP. For the items from the emotional function dimension, both item-remainder analyses and internal criterion analyses (Likert, 1967) were performed. The results from each of these analyses were compared to isolate items which did not measure what other scale items measured (item-remainder analysis) and did not meaningfully discriminate between the two groups of persons who were high or low scorers on the scale (internal criterion analysis). All isolate items were then considered for deletion from the instrument, and all remaining items were subjected to a measure of internal consistency, Cronbach's

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alpha (Cronbach, 1951). Originally, there were 26 items in the Emotional functioning dimension on which the item-remainder analysis was run. Spearman correlations for the analysis ranged from .17 to .59 with 19 of the items producing correlations of .40 or higher. Internal criterion analysis was then performed, and it revealed mean score differences between upper and lower tertiles ranging from 0.8 to 1.9 (out of a possible 4.0). Those results led to three items being dropped from among the Emotional functioning dimension. Internal consistency for the remaining 23 items on this dimension was .85 as measured by Cronbach's alpha.

Guttman scalogram analysis (Guttman, 1944) was used as a measure of reliability for the ambulation items of the Physical functioning dimension and for the Social functioning dimension, because the two groups of items were developed as unidimensional constructs with items selected to reflect incremental changes in function. The coefficient of reproducibility (indicates the predictability of a respondent's scale score for the resulting response pattern) and the coefficient of scalability (indicates the extent to which the scale is unidimensional and cumulative) (Edwards, 1957) were both generated in these analyses. For the ambulation items in the Physical functioning dimension, the Guttman scalogram analysis revealed high coefficients for reproducibility (.98) and scalability (.89). Items with substantive overlap with other items and items which lowered scalability were eliminated from the original 15 items leaving nine items in the final Physical functioning dimension. Guttman scalogram analysis for the Social functioning dimension yielded coefficients

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of .93 for reproducibility and .71 for scalability. This dimension started out with five items, and all five were retained (Parkerson et al., 1981).

Temporal stability was assessed for each of the four health dimensions, but only those patients whose health status was expected to show minimal change from initial to return visit could be used in the particular reliability analyses. Only 10% of the original 395 participants met those inclusion criteria, and almost all of them were women. That necessitated the drawing of a second sample from the Family Medicine Center patient population and yielded a group consisting of 100 male patients. Of that new sample, 55 participants completed the DUHP upon admission and during return visits that ranged in time from one to eight weeks subsequent to the initial administration. Spearman rank-order correlation coefficients between test and retest scores for the components of the four dimensions ranged from a low (.32) on the digestive symptoms component of the Symptom status dimension to a high of .89 on the ambulation component of the Physical functioning dimension. For the dimensions, the test-retest correlation coefficients were as follows: Physical functioning (.82), Emotional functioning (.72), Symptom status (.68), and Social functioning (.52). Sixty of the 63 individual items showed positive test-retest score correlations ranging from .15 to .87 with a median and mean of .54. The three items which lacked positive correlations, fainting, walking to the bathroom, and self-care, were retained with the other items because of their clinical importance (Parkerson et al., 1981).

Only one other study regarding the reliability of the DUHP subscales can be found. Eighty-four middle-aged and older adults (mean age was 60 years) completed

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the DUHP along with a battery of other instruments. The study was proposed to test the psychometric properties of the Quality of Life Scale (QOLS; Flanagan, 1978) with a group of participants who suffered from one of four chronic conditions: diabetes mellitus, ostomy secondary to colon cancer or colitis, osteoarthritis, or rheumatoid arthritis. The participants were administered the test battery at Time 1 with retesting at Times 2 and 3. Time 2 followed Time 1 by three weeks, and Time 3 followed Time 2 by another three weeks. The individual test-retest reliability coefficients were not listed for each of the DUHP's four dimensions, but the findings did show that the coefficients ranged from .53 to .90 (Burckhardt, Woods, Schultz, & Ziebarth, 1989).

Content validity and construct validity were both established for the DUHP, but criterion-related validity was not, for no suitable "gold standard" with which to compare scores existed at the time of the instrument's development. Therefore, the principal method used in developing the DUHP was construct validity. Of the original 395 participants, 322 self-administered the DUHP. From the 322 who self-administered the instrument, 315 also completed one of three comparison instruments: 103 completed the Sickness Impact Profile (SIP; "Sickness Impact Profile," 1978), 101 completed the Tennessee Self-Concept Scale (Tennessee; Fitts, 1964), and 111 completed the Zung Self-Rating Depression Scale (Zung; Zung, 1965) (Parkerson et al., 1981).

Part of the validity study performed by the developers of the DUHP involved the determination of demographic correlations. To do this, predicted and observed associations between DUHP scores and demographic characteristics of participants

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were compared. Using a modified Delphi approach requiring three rounds to reach consensus (Millholland, Wheeler, & Heiek, 1973), the researchers hypothesized the expected strength and direction of the associations on a scale of -4 to $+4$. Spearman correlations were then used for the analysis of observed associations. As was expected, the younger the participant, the higher the health status score. The highest such correlation was on the Physical functioning dimension (.49), followed by Symptom status (.20). Weaker correlations for age and Social functioning (.14) and between age and Emotional functioning (.11) were found. Little difference between males and females with respect to emotional and social functioning was observed. Males reported slightly higher physical function and fewer symptoms. Virtually no effects were produced with regard to race and marital status. Socioeconomic status (SES), education, and occupational status all related with DUHP scores so as to suggest that participants in the higher status groups had higher Physical functioning scores and only marginally higher scores on Symptom status and Social functioning than those in the lower status. Emotional function was not related to SES, education, or occupation. The predicted and observed relationships between DUHP mean scores and demographic characteristics of patients yielded an overall Spearman correlation of .79 ($p < .0001$) (Parkerson et al., 1981).

As for the calculations performed regarding correlations among the four dimensions of the DUHP, Symptom status was highly correlated with the other three dimension scores (.45 with Physical functioning, .30 with Emotional functioning, and .36 with Social functioning). Emotional status tended to have the lowest overall

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correlations with the scores of the other three dimensions (.30 with Symptom status, .17 with Physical functioning, and .27 with Social functioning) (Parkerson et al., 1981).

As was expected, the four DUHP dimensions correlated reasonably well with the SIP scores. The correlations ranged from a low of .31 on the Social functioning dimension to a high of .66 on the Symptom status dimension using Spearman rank-order correlation coefficients ($p < .05$ for all correlations). A high correlation between the Tennessee total score and the DUHP Emotional functioning dimension score was produced as expected (.89, $p < .05$). The reason such a correlation was expected was because both are measures of self-esteem. The Zung measures somatic and psychological components of depression which are, in part, reflected by patients' symptoms. Thus, high correlations with the DUHP's Symptom status dimension score (.61) and the Emotional status dimension score (.57) emerged (Parkerson et al., 1981).

Comparisons among correlations were also analyzed for convergent and discriminant validity. The monocomponent-heteromethod was used to determine convergent validity and produced correlations between the respective components of the DUHP and the SIP which ranged between .34 and .45 ($p < .05$). Given that those correlations were well above zero and in the same expected positive direction, convergent validity was supported. With few exceptions, those correlations were higher than others in the same row and column of the square heterocomponent-heteromethod section of the matrix. That was an indication that the measurement effect of the respective components by the two instruments exceeded that expected

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from random variation alone. Thus, discriminant validity was supported. Further evidence for discriminant validity was demonstrated the monocomponent-heteromethod correlations were higher than the heterocomponent-monomethod correlations for a given method. That indicated that the effect of the method exceeded instrument variance. Thus, the discriminant validity of the DUHP was deemed high (Parkerson et al., 1981).

As has been shown, the DUHP is an instrument for which good internal consistency has been demonstrated. The test-retest reliability for the instrument's four dimensions is moderate to good. Construct validity in terms of predicted versus observed relationships between DUHP scores and patient characteristics has been supported for all four health dimensions. Convergent and discriminant validity was supported for all portions of the Emotional and Social functioning dimensions, for all but two items of Physical functioning, and for half of the Symptom status items. The researchers explained that unvalidated portions were primarily those for which few positive responses were elicited in their relatively healthy study group, or for which comparable items were not available from other instruments (see Parkerson et al., 1981).

Personal Information Questionnaire (PIQ). The PIQ is a form designed for the purpose of gathering pertinent sociodemographic information on the participants of this study. The form was put together by the primary researcher with the assistance of his dissertation committee chairperson. It asks participants to answer basic questions pertaining to themselves about their age, date of birth, gender, race, marital status,

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occupation, years of education completed, employment status, and income. In addition, a few questions have been included which attempt to tap information regarding the "ruralness" of the participant. The first page of the PIQ comprises a section for the written instructions along with blanks to be used by each participant to supply their name, address, telephone number, and to give permission to be contacted for additional information. The name, address, and telephone number are all optional as indicated by a statement printed subsequent to the instructions. It is explained in the instructions that if the participant chooses to supply any identifying information, the upper half of the first page which includes such information will be detached and stored in a locked file. It is also made clear in the instructions that the purpose of the identifying information is for contacting participants in the future should more information be needed. Also, it is clearly stated that once all needed information is collected, all identifying information will be destroyed. The PIQ was designed to take less than five minutes to complete and to be easily read by anyone with a ninth-grade education.

Procedures

All data was gathered at one primary care private practice in a rural area of western Oklahoma. The owner of the primary care practice estimated that each of his patients waited an average of 45 minutes from the time they entered his office until the time they got in to see him or his associates. Forty-five minutes was believed to be ample time for patients to complete the entire battery. He agreed initially to have his receptionist ask his patients as they signed in if they would be willing to participate in

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a study designed to potentially improve the overall services offered to the patients of the facility. Also, his receptionist was to administer the battery to each person agreeing to participate. As it turned out, the tasks agreed to be completed by the doctor's receptionist put too much strain on the resources of the clinic, so it was proposed that the primary researcher would recruit and train assistants to take care of all administrative tasks pertinent to the study. The doctor readily agreed to such an arrangement. Altogether, six masters level students were recruited from the masters program in community counseling at the University of Oklahoma. They were escorted to the primary care facility by the primary investigator, introduced to the owner of the facility and his staff, and trained in all facets of administering the battery of instruments used. Three of the assistants quickly realized that their schedules would not accommodate the strain put on their resources by assisting in the project, and they bowed out of the study. In the end, the three remaining research assistants gathered nearly all the data by themselves. At no time, however, did all three present to the clinic together. One of them started out as the sole assistant, but when she had to move out of the state, the others were recruited, and the two who continued to help sometimes drove down together and sometimes went alone to collect data.

The doctor/owner of the clinic had his staff inform the assistants about who among his day's clientele met criteria for participation. He then allowed the assistants to approach those who met criteria and inquire about their willingness to participate in this study. Those who agreed were taken to an exam room if one was available where the study was explained, the informed consent form was read and signed, and the

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battery of instruments was administered. In some cases, no exam room was available, and all of the procedures had to be performed in the waiting area, a semi-private room adjacent to and separated by a door from the main receiving area of the clinic.

Those who agreed to participate received an explanation of the study using a standard statement. Once they had been read the statement and voiced their understanding of it, the assistant made sure the informed consent form was read by or to the participant and that they also understood and properly signed it. In addition, the reading ability of each participant was informally assessed prior to the administration of the instruments to ascertain if their reading skills were sufficient to ensure a thorough understanding of all questions to be read. Those who demonstrated adequate reading ability and a willingness to read the instruments on their own initiative were given the battery to complete. Each battery was counterbalanced to account for ordering effects. In other words, the order in which the instruments were administered varied; the order of instruments in any one packet was identical to the order of instruments in the packet presented to the fifth subsequent participant. Once a participant completed all forms, the assistant gathered the forms, checked everything to ensure all questions were answered, and then placed the battery and corresponding consent form in an envelope and sealed it in front of the patient. Initially, the plan was for each participant to then be asked to indicate where they lived by writing their individual identification number in the area where their residence was located on one of two maps which was to be attached to a wall in the clinic. One of the maps was of the county in which the primary care facility was located and was intended to be used

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for those participants who lived outside the city limits. The other map was of the town in which the primary care facility was located and was intended for use by the participants who lived within the city limits. The maps were hung in an area of the facility out of ready view by clinic patients. That plan was abandoned when it was realized that many of the participants were reluctant to mark their residence on a map and refused to do it.

Each participant had signed a form granting the researcher or research assistants the right to view his or her medical record for the purpose of recording information relevant to primary care service utilization. For this purpose, the Utilization Form was used, the research assistants counted the number of times each primary care service had been received by the participant during the year prior to participation in the study, and the results for each of the nine services/variables were recorded on the UF. The UF for each participant was later matched to the participant's assessment findings by the identification number printed on the upper right corner of the form. Completion of the UF finalized the data gathering process, and once all assessment batteries and utilization forms were completed, all of the information was gathered from the clinic by the primary investigator for scoring and analysis.

Results

Participant Demographics

Fifty rural residents participated in this study. As shown in Table B1, the sample was comprised of 32 females and 18 males whose ages ranged from 18 to 86 years ($M = 56.34$ years, $SD = 19.44$ years). As a group, 62% of them were 50 years of

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age or older, 48% aged 60 or older, and 36% between the ages of 70 and 86. Women averaged 56.84 ($SD = 19.75$ years) years of age with males slightly younger ($M = 55.44$ years, $SD = 19.42$ years).

Thirty-eight percent ($n = 19$) of the participants reported living with only their spouse, while 28% ($n = 14$) lived alone. Much smaller percentages of participants reported living in other arrangements. Specifically, 12% ($n = 6$) lived with their spouse and children, 10% ($n = 5$) with children only, 6% ($n = 3$) with only relatives, 4% ($n = 2$) with spouse and relatives only, and 2% ($n = 1$) with only friends.

Table B2 shows the racial breakdown of participants. Altogether, 88% ($n = 44$) of those who participated in this study were White, and none were Asian or African Americans. Of the remaining six participants, three listed themselves as Mexican Americans (all females) and three were American Indians (two males, one female).

Table B3 shows that all but three participants reported level of educational attainment. Of the 47 participants who did indicate educational level, 14% ($n = 6$) did not attend past eighth grade, 36% finished twelfth grade, and 34% ($n = 17$) said they had at least some college. The greatest number of years of educational attainment was 20.

Half of the female participants reported being currently married, 22% widowed, and 16% divorced. In contrast, none of the men in the study were widowed, over 72 % were married, and 11% divorced. Rates of separation for both women and men were about 6%, with approximately 6% of the women and 11% of men listing themselves as having never been married (see Table B4).

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As to employment status, 48% of all participants listed themselves as retired. Table B5 shows just over 56% of the women and one-third of the men as retired. Only 22% of the sample reported being employed. Half of all male participants ($n = 9$) were employed, while only about 6% of all females in the study were of the same status. Thirty percent of all participants reported themselves as unemployed (37% of the women and around 17% of the men).

Table B6 reveals that almost 22% ($n = 7$) of the study's females used some form of tobacco product and that what they opted for was cigarettes. Males' tobacco use was split evenly between cigarettes and smokeless tobacco with just over 22% reporting use of each form ($n = 4$ for cigarettes; $n = 4$ for smokeless tobacco). Ten of the participants reported using at least some alcohol on a regular basis; five of those using were females (15.6% of all women) and five were males (27.8% of all men).

Nature of Stress

The first research question pertains to the nature of rural stress in this sample. Descriptive statistics for REQ item frequencies, item category means, and the absolute sum of scores, sum of negative scores, and sum of positive scores will be determined and reported. Finally, the REQ subscale correlational matrix will be examined by using Pearson r . Given the exploratory nature of this study, an alpha of .05 was selected as an indicator of statistical significance.

REQ item scoring. Pertaining to REQ item scores, three were of import: item total positive score, item total negative score, and item absolute total score (see Table C1). Absolute scores for REQ items ranged from 32 to zero. Four REQ items received

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absolute scores of 30 or more, the absolute total score on nine items was in the twenties, 24 items had absolute total scores ranging from 10 through 19, and the remaining 43 items received absolute scores of less than 10. Three REQ items received absolute total scores of zero.

The most highly endorsed item was number 37 with an absolute total score of 32 (Table C1). It inquired about the impact on the participant of serious illness, injury, or hospitalization of a close family member during the past 12 months. Fifteen of the item's points were related to positive effect, while 17 points were the result of negative impact. Right behind Item 37 with an absolute total score of 31 were Items 24 and 36. Item 24 gave the participant the opportunity to note the impact of a major unplanned expense. Most of its 31-point total was accounted for by its total negative score of 21, while 10 points accrued from the event being perceived as having been one with positive consequences. Item 36 assessed the impact on the individual of the death of a close family member. Its total positive score was 14, and 17 points of its total score were associated with negative effects. Rounding out the four items with scores of 30 or more was Item 73 which inquired about the effect on the participant of their own serious illness, injury, or hospitalization. The absolute total score for this item was 30 with 16 of those points associated with a positive effect; the other 14 stemmed from negative experiences.

Moving on to item total positive scores, one can see that they ranged from a high of 22 down to zero (refer to Table C1). Item 2, which asked the respondent to rate the impact of a change in work responsibility during the past 12 months, received

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the highest total positive score, and it was the only item with such a score above 20. The total positive score for Item 72 was 19, and it asked participants to rate the effect on them of living on a ranch or farm. The third highest positive score total came for Item 71; it was 17. Item 71 inquired about the nature of the impact of working on a ranch or farm throughout the previous year.

Item total negative scores ranged from zero through 21 which occurred for Item 24 (see Table C1). Again, this item allowed participants to respond about the impact on them of a major unplanned expense during the past 12 months. Item 49 had the second highest total negative score which was 19. This particular item asked the respondent to rate how strong an impact the death of a close friend had on them. Items 36 and 37, which were mentioned earlier due to their high absolute total scores, each had a total negative score of 17.

As can be seen, as well, from reading Table C1, the REQ total positive score for this study was 476. The total negative score was 412, and the absolute total score was 888.

Moving on to Table C2 affords one the opportunity of seeing the mean absolute total score and standard deviation of each of the seven REQ item categories. The category means ranged from 7.45 to 16.46. The Rural Events category, comprised of Items 60 through 72, had the highest average absolute total score, and the Relationship Events category had the lowest.

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Table C3 shows the positive score mean and standard deviation for each of the seven REQ item categories. The category positive score means range from a low of 3.55 for Relationship Events to 8.23 for Rural Events.

The REQ category total negative score means and standard deviations are shown in Table C4. The Living Conditions total negative score mean of 3.13 was the lowest of the seven categories. As had been the case for the two previously reported REQ category average scores, the Rural Events category total negative score mean of 8.23 was the highest among the related category means.

REQ item category correlations. The REQ item category correlational matrix can be viewed in Table C5. Thirteen category pairings were correlated at a significance level of less than .05. The most significant correlations occurred between the Financial Events and Work-Related Events categories, the Rural Events and Relationship Events categories, and the Miscellaneous Events and Rural Events categories. All three were statistically significant with $\alpha = .0001$. Following closely was the correlation of the Financial Events and Miscellaneous Events pairing which occurred at the .0002 level of significance. Miscellaneous Events correlated with the Family-Related Events category and with the Relationship Events category at the .0007 level of significance. Of all the intracategory pairings, the one between the Living Conditions and Relationship Events categories produced the least significance as it occurred at greater than the .65 level of significance.

The correlation between Financial Events and each of the other six categories was significant at less than the .05 level. The Miscellaneous Events category had

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correlations at the .05 level of significance with all but the Living Conditions category.

Next on the list of most intrascale correlations were the Family-Related Events and Rural Events categories which each correlated with three other categories as well as with each other at the .05 level of significance. The Relationship Events category correlated with three of the other categories at the .05 level of significance, while the Living Conditions and Work-Related Events categories each had the fewest intracategory correlations with just two at the aforementioned level of significance.

Psychological Symptoms of Distress

The second research question inquires about the nature of psychological symptoms of distress in the sample. Descriptive statistics relevant to participants' BSI subscale and Global Severity Index (GSI) T-scores are recorded. Findings pertaining to positive diagnosis will also be discussed. The symptom dimension and GSI means for female and male subgroups will be compared to the relevant adult nonpatient sex-specific norms using Student's *t*. Significant differences will be determined and reported with the Bonferroni principle of inequality for controlling familywise error rate. For the sample as a whole, the same comparisons will be made with the normative group of adult nonpatients.

Individual observations pertaining to psychological distress. Since the BSI was used in this study as the measure of psychological distress, female and male participant BSI symptom dimension and GSI scores were converted to T-scores, so observations regarding mental health status could be made. As can be seen in Table D1, the symptom dimension T-scores of female participants in this study ranged from

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38 through 80. The mean T-score for the sample was 56.01 with a standard deviation of 12.01. For the females, the T-scores on the GSI ranged from 33 and 80, inclusive; the mean equaled 59.13, and the standard deviation was 11.39.

Of the study's female participants (see Table D1), 65.63% ($n = 21$) met BSI criteria for positive diagnosis or caseness (Derogatis, 1993). Twenty-eight percent of participating females ($n = 9$) met criteria by having T-scores on two or more symptom dimensions which were equal to or greater than 63. The remaining 12 females (37.5% of all female participants) who met criteria for caseness had T-scores on at least two symptom dimensions as well as the GSI which equaled or exceeded 63. None of the females met criteria for positive diagnosis by having a T-score of 63 or greater on only the GSI, and just six (18.75% of the study's females) met criteria by having significant T-scores on the minimum of two symptom dimensions. Two of the female participants (6.25% of all women in the study) had T-scores which exceeded 63 on every symptom dimension and the GSI. The T-scores for three others (9.38% of all female participants) exceeded 63 on the GSI and all but one of the symptom dimensions. By coincidence, two of those three women were aged 43; Phobic Anxiety was the only symptom dimension for the two on which the T-score was less than 63; and for each, their T-score for that particular dimension equaled 45.

For the 21 (66% of all females) women who met BSI positive diagnosis criteria, 16 (50% of all female participants) had T-scores of 63 or greater on the Somatization dimension, and 15 (47% of the study's females) had significant T-scores on the Obsessive-Compulsive dimension. The T-scores were significant on the

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Psychoticism dimension for 13 (41% of all females) of the positively diagnosed women, and 12 (38% of all female participants) had significant T-scores on the Global Severity Index. Of the same subset of women, the total number of T-scores equaling or greater than 63 per dimension decreased steadily by dimension to a low of six on the Hostility symptom dimension (refer to Table D1).

T-scores on the Somatization dimension were significant for 19 (59.38%) of the women, altogether (see Table D1). The number and percentage of women, regardless of status relative to being diagnosable by BSI standards, who scored significantly by symptom dimension and on the GSI were as follows: Obsessive-Compulsive = 15 (46.88%), Interpersonal Sensitivity = 10 (31.25%), Depression = 9 (28.13%), Anxiety = 11 (34.38%), Hostility = 6 (18.75%), Phobic Anxiety = 9 (28.13%), Paranoid Ideation = 8 (25.00%), Psychoticism = 13 (40.63%), and Global Severity Index = 12 (37.50%).

The BSI symptom dimension and Global Severity Index T-scores for the study's male respondents can be found in Table D2. Listed are the respondents' T-scores by BSI symptom dimension which ranged from 39 through 80. The mean of those scores was 58.91, and the standard deviation was 13.09. The T-scores for the GSI in this sample of men ranged from 45 through 80 with a mean of 62.22 and a standard deviation of 13.50.

The T-scores of 10 (55.56%) of this study's 18 men were such that they met BSI criteria for caseness (see Table D2). Of those 10 men, two (11.11% of all male participants) had results which produced significant T-scores on all nine BSI symptom

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dimensions and the GSI. Two others had T-scores on eight of the nine dimensions and GSI which were significant. Altogether, eight (44.44% of the study's males) of those who met criteria for caseness did so by having GSI and two or more symptom dimension T-scores which were equal to or greater than 63. Of the remaining two men, one had two dimensions and the other had three for which the T-scores were significant.

When taking only the 10 diagnosable males into account, Table D2 shows that eight had significant T-scores on the Somatization, Depression, and Anxiety symptom dimensions, and the same number scored significantly on the GSI. Seven of the 10 produced significant results on the Obsessive-Compulsive, Interpersonal Sensitivity, Phobic Anxiety, and Paranoid Ideation symptom dimensions. Of that same group of males, there were six significant scorers on the Psychoticism dimension and five who had significant T-scores on the Hostility dimension.

The number of significant scores per symptom dimension changed somewhat when all 18 males' scores were taken into account (refer to Table D2). By so doing, nine (50.00%) of the Anxiety dimension results were significant. Eight (44.44%) produced significant results relative to the Somatization, Interpersonal Sensitivity, Depression, and Phobic Anxiety dimensions. The Obsessive-Compulsive, Paranoid Ideation, and Psychoticism dimensions each had seven (38.89% of all men) significant findings. Still, only five (27.78%) of the men produced significant results on the Hostility dimension. The number of positive T-scores on the GSI remained at eight.

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Turning to Table D3, one can view the BSI symptom dimension and GSI mean T-scores in decimal equivalents for both females and males. However, since T-scores are meant to be expressed as whole numbers, they will be rounded to the nearest whole number and discussed as such.

The female participants' GSI mean T-score was 59 (refer to Table D3). For the symptom dimensions, the highest finding was for the Somatization dimension, where a mean T-score of 61 was realized. The second highest mean T-score of 60 was observed for both the Obsessive-Compulsive and Psychoticism dimensions. The next highest mean T-score was 55 and was found for the Anxiety and Depression dimensions. The Paranoid Ideation and Interpersonal Sensitivity dimensions each had a mean T-score of 54. The lowest results occurred for the Hostility and Phobic Anxiety dimensions, where the mean T-scores were 53 and 52, respectively.

For the male participants, the mean GSI T-score was 62, just one point below the T-score which would have meant the entire subset met criteria for positive diagnosis (see Table D3). In reference to symptom dimension, the highest mean T-score to emerge was for Somatization (mean T-score = 62). A mean T-score of 61 meant the Depression dimension ranked second in terms of symptom severity. This was followed by the Anxiety dimension where the mean T-score was 60. Mean T-scores of 59 were found for the Phobic Anxiety, Interpersonal Sensitivity, Psychoticism, and Obsessive-Compulsive dimensions. The two lowest findings were for the Paranoid Ideation and Hostility dimensions with mean T-scores of 58 and 54, respectively.

Sample and normative group comparisons. One can see in Table D4 how the BSI symptom dimension and Global Severity Index score means, using Student's t for a two-tailed test, compared to those of the normative group of adult nonpatient females. It was determined that the familywise error rate would be fixed at .05. Given that 10 such comparisons were to be made, this meant the effective per-comparison rate on any single test, according to the Bonferroni principle, would be .0025. As is shown, four mean comparisons yielded a p -value of less than the determined per-comparison rate. Of the four, the most significant difference between means was found on the Somatization dimension (mean difference = .79 points, $df = 31$, $t = 4.60$, $p < .000034$). The mean comparison on the Obsessive-Compulsive dimension produced a very significant difference (mean difference = .71 points, $df = 31$, $t = 4.26$, $p < .000089$), as well, and was followed in significance by those of the Psychoticism dimension (mean difference = .47 points, $df = 31$, $t = 3.29$, $p < .0013$) and the GSI (mean difference = .44 points, $df = 31$, $t = 3.47$, $p < .00077$), respectively.

For the men, the same error rate criteria which applied to their cohorts were in effect. Thus, the effective per-comparison error rate observed for any single test of BSI symptom dimension and GSI means was, again, .0025. Table D5 reveals the results of the between the male participants and the normative group of adult nonpatient males using Student's t for two-tailed tests. As can be seen, only one such comparison showed significance, and it was found between the means on the Somatization dimension (mean difference = .52 points, $df = 17$, $t = 3.31$, $p < .0021$).

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Student's t for two-tailed tests was used again to determine the significance of comparisons between the BSI symptom dimension and GSI means of the sample as a whole and the normative group of adult nonpatients. As was the case for the two previously discussed subsamples, it was determined that .0025 was the effective per-comparison rate to be used on any single test. Given these criteria, six tests were significant (see Table D6). Of those six, the Somatization dimension proved to be the most significant (mean difference = .71 points, $df = 49$, $t = 5.66$, $p < .00000039$). Close behind was the Obsessive-Compulsive dimension (mean difference = .64 points, $df = 49$, $t = 5.07$, $p < .000003$). Two comparisons were very close in significance, the Phobic Anxiety dimension (mean difference = .49 points, $df = 49$, $t = 4.80$, $p < .000008$) and the Global Severity Index (mean difference = .47 points, $df = 49$, $t = 4.77$, $p < .000008$). Following in order of significance were the Depression (mean difference = .56 points, $df = 49$, $t = 4.69$, $p < .00001$) and Interpersonal Sensitivity (mean difference = .50 points, $df = 49$, $t = 3.48$, $p < .00054$) dimensions.

General Health

Answers pertaining to the question about the general health of this sample were derived from dimension scores on the DUHP. Since only group normative data were available, each dimension raw score for the sample was compared to the relevant dimension score for the normative group of adults. Student's t was used for the comparisons, and again, the Bonferroni principle of inequality for controlling familywise error rate was observed. Given that only four tests were to be run, this meant that the effective per-comparison rate for controlling the familywise error was

.00625. As it turned out, only one dimension mean comparison showed significance, the Symptoms dimension with $p < .00004$ (refer to Table E1).

Predictions

For the research questions regarding the relationships between specific predictor and criterion variables, the answers were ascertained through the use of simultaneous entry regression. Due to sample size limitations, a maximum of three predictor variables for each criterion variable were analyzed for the sample as a whole and for the female and male subsamples individually.

It was determined that the criterion variable for physical health would be the Symptoms dimension mean of the Duke-UNC Health Profile (DUHPSYM), because the developers of the DUHP cited it as best fulfilling this role (Parkerson et al., 1981). For psychological distress, the Global Severity Index mean of the Brief Symptom Inventory (BSIGSI) was chosen as the criterion variable. This choice was made, because the developers of the BSI referred to it as the most universal indicator of overall mental health (Derogatis & Melisaratos, 1983).

The three predictor variables chosen for psychological distress were the Global Severity Index (BSIGSI) mean and the Obsessive-Compulsive (BSIO-C) and Depression (BSIDEP) symptom dimension means of the Brief Symptom Inventory. Again, the GSI mean was chosen because, as previously noted, it was cited by the BSI developers as the most universal indicator of overall mental health (Derogatis & Melisaratos, 1983). The Obsessive-Compulsive symptom dimension mean was chosen, because the symptomatology reflected by this dimension seemed to play a

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particularly strong role in the mental health of the entire sample and the female subgroup. Though the mean score of the Depression symptom dimension was significant for only the group as a whole, it was chosen as a predictor variable, because there has been a great deal written through the years about the amount of depression experienced by rural residents (Hoberman, 1987; National Mental Health Association, 1988; Ritchie & Ristau, 1986; Weigel, 1981).

The three predictor variables for rural stress were the absolute total score mean (REQTOT) and the Rural Events (REQRUR) and Financial Events (REQFIN) item category means of the Rural Experiences Questionnaire. The absolute total score was chosen, because the developer of the REQ viewed it as most representative of the level of stress being experienced by individuals (Templeman et al., 1989). Furthermore, this approach was consistent with other literature on stress research (Sarason et al., 1978). The choice of using the mean from the Rural Events category evolved in part from perusing the items of all seven categories and finding that the items specific to that category seemed to reflect events which would be most unique to rural living. Also, many researchers have noted that events seemingly unique to rural living have been the ones frequently found as the most salient of the stressors experienced by people in rural areas (Berkowitz & Hedlund, 1979; Hedlund & Berkowitz, 1979; Miller, Bentz, Aponte, & Brogran, 1974; Rosenblatt & Anderson, 1981; Tevis, 1982; Weigel, 1981). Furthermore, each of the highest item category score means emanated from the rural Events category. The use as a predictor of the mean related to financial concerns stemmed from the observation that a great deal had been written through the years

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about the financial plight of rural Americans (Bergland, 1988; Bird & Kampe, 1977; Human & Wasem, 1991; Mikesell, 1977; National Rural Center, 1981; Watkins & Watkins, 1984). With this in mind, it seemed it would be important to know the role played by stress related to finances in the prediction of health status for this study's participants.

Psychological distress as it predicted physical health. The first attempt at prediction involved seeing how or if psychological distress predicted physical health. As Table H1 shows, when regressions were run on the data pertaining to all participants, only the Obsessive-Compulsive symptom dimension mean of the BSI predicted the variable chosen as most indicative of overall physical health, the DUHP Symptoms dimension mean ($F = 7.81, P < 0.008$). Looking at Table H2, one can see that for the female subsample, the Obsessive-Compulsive symptom dimension mean of the BSI was again the only psychological distress predictor variable to produce a significant F -value ($F = 7.62, P < 0.01$) with the physical health criterion variable. Finally, as can be seen in Table H3, psychological distress did not appear to predict physical health for the males of this study.

Rural stress as it predicted psychological distress. The results pertaining to how well rural stress predicted psychological distress for all participants can be seen in Table H4. Only the REQ Financial Events category mean seemed to predict the most salient indicator of psychological distress, the BSI Global Severity Index ($F = 6.69, P < 0.02$). Likewise, for the females (refer to Table H5), only the Financial Events category mean of the REQ appeared to have the ability to predict psychological

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distress ($F = 7.73$, $P < 0.02$). Table H6 reveals that, for the males, rural stress did not appear to successfully predict psychological distress.

Rural stress as it predicted physical health. Tables H7, H8, and H9 show the results of the regressions run to determine if rural stress was predictive of physical health for all participants and female and male subsamples, respectively. As can be seen, physical health was not predicted by factors related to rural stress for the participants in this study.

Discussion

The idea for this exploratory study of the relationships between and among stressors deemed part and parcel to rural existence and the mental and physical well-being of folks residing in rural areas of America was spawned by various factors. The first of those was this investigator's sense of connectedness to and passion for rural life as it is known today in America. The second factor was the knowledge that virtually nothing is known about the aforementioned relationships (Walker & Walker, 1988a). Furthermore, others have persuasively argued that there is a genuine need for a greater focus by researchers on the mental and physical needs of rural inhabitants and on the role played by stress in each of these (Breznitz & Goldberger, 1982; Murray & Keller, 1991). It has been stated that without the insights provided by such investigations, training programs cannot be properly developed to equip mental health professionals with the skills needed to effectively and appropriately address the often distinctive issues presented by rural dwellers (Hutner & Windle, 1991; National Institute of Mental Health [NIMH], 1986; Phillips & Murrell, 1994; Schneider, 1982; Task Panel

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on Rural Mental Health, 1978). Thus, this study was proposed with the intention of garnering answers to a number of questions about stress and the mental and physical health of rural inhabitants.

Participant Demographics

Accomplishing this task first involved analyzing the data gained from the battery of assessment instruments administered to each of the 50 people who participated in this study. As it turned out, 32 of those folks were women, and as a group, their mean age was almost 57 years. The 18 male participants' average age was just over 55 years. On the surface, these mean ages might appear to be high, but such findings seem quite consistent with those of previous research suggesting that a disproportionate number of America's elderly are now residing in rural areas (Human & Wasem, 1991; Sofranko, Fliegel, & Glasgow, 1983). As well, older people tend to be over-represented in terms of medical health service utilization (Barer et al., 1988; Evans et al., 1989). Therefore, given this sample was both rural and accessed from a primary care facility, such a finding pertaining to average age is not surprising.

Nature of Stress

For questions related to stress, the results of the Rural Experiences Questionnaire were evaluated in terms of individual stressors and stressors by category. In looking at individual items only, the three most highly endorsed stressors all pertained to concerns about the health of oneself or others. Two of those items inquired about the impact on the participant of the serious illness, injury, hospitalization, or death of a family member. The other item assessed what effect

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one's own serious illness, injury, or hospitalization produced. Two other items with relatively high endorsement rates queried about the impact of having no guaranteed, steady income and the death of a close friend. Finding a high response rate to experiences such as these just mentioned was not at all surprising given the number of senior citizens among the participants, for one could intuitively expect that issues related to the sequelae of deteriorating health, death of loved ones, and income would likely be dominant stressors. These findings are also less revelatory when viewed in light of previous research on rural dwellers revealing that the severity of stressors was determined primarily by the importance, duration, frequency and concurrence, and the unexpectedness of events (Weigel, 1981). Furthermore, concerns about health would be anticipated from a primary care medical outpatient sample. On the other hand, it came as no real surprise, given that most participants were beyond typical childbearing years, to find that items pertaining to the impact of serious illness, injury, hospitalization, or death of one's child received relatively low endorsements.

Turning to results related to categories of stressors, the finding that the mean score of the REQ Financial Events category was only fifth among the total score means of the REQ's seven item categories was intriguing. Even when ranked by average negative impact, that same item group ranked third. Such findings seem unlikely when one realizes the amount of attention given in recent years to the financial woes of rural Americans (Keating, Doherty, & Monroe, 1986; Marotz-Baden & Colvin, 1986; Murray, 1985; Murray & Keller, 1991; National Association of Community Health Centers and National Rural Health Association [NACHC-NHRA], 1988; National

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Rural Center, 1981; Olson & Schellenberg, 1986; Schellenberg, Olson, & Fuller, 1985; Walker, Walker, & MacLennan, 1986; Walker & Walker, 1987a). In contrast, the events categorized as Rural Events, those which are arguably the most unique to rural living, produced the greatest average impact on the participants. The items of this category assessed the impact of such events as isolation from others due to bad weather and distance; the effects of weather on crops and the crop market, livestock and the livestock market, and on harvest, field work, and /or planting; taking part in harvest; a variable or inconsistent work schedule; and a lack of certain community services or resources. This finding could have significant implications for health care workers, because it suggests that service utilization needs and rates may vary in a manner which could be predicted if one was to develop a good understanding of the geography and climate of the region in which their clientele resided. Indeed, this finding is in line with other studies (Berkowitz & Hedlund, 1979; Hedlund & Berkowitz, 1979; Miller, Bentz, Aponte, & Brogran, 1974; Rosenblatt & Anderson, 1981; Tevis, 1982; Weigel, 1981) which have suggested that experiences most unique to rural living are the ones most likely to be perceived as particularly stressful by rural dwellers. Clearly, attempts to study or assess stressful experiences in rural populations must utilize instruments or methods that include measurement of specific rural events and issues. The REQ, as revised by Brown and Pace (1996) is currently the best available instrument for this purpose.

Psychological Symptoms of Distress

As for the psychological symptomatology of rural inhabitants, the information is quite limited. Almost all of the published studies have been designed to determine the frequencies reported for symptoms of distress. Of the stress-related psychological problems reported to date, more have been primarily symptomatic of depressive disorders, but some have suggested that participants may have been experiencing a clinically significant degree of anxiety, as well (Hoberman, 1987; Knudsen & Wilson, 1985; National Mental Health Association [NMHA], 1988; Ritchie & Ristau, 1986; Weigel, 1981). Also of interest was the finding by Walker and Walker (1988a) showing that women reported symptoms of stress-related psychological problems significantly more often than did their male counterparts. The level of psychological symptomatology reported by the two subgroups in this current study seemed to lend some credence to Walker and Walker's findings in that, in terms of the BSI operational definition of caseness or positive diagnosis proffered by Derogatis (1993), roughly 66% of the females compared to 56% of the males would have met criteria for some sort of psychiatric diagnosis. Looking at it another way, the female subgroup scored significantly higher than the BSI norm group to which their dimension scores were compared on the Somatization, Obsessive-Compulsive, and Psychoticism dimensions and the Global Severity Index. The males on the other hand scored significantly higher than the BSI norm group to which their scores were compared on the Somatization symptom dimension only.

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The occurrence of a Somatization Disorder diagnosis for men in the United States is quite rare. For women, however, it has been estimated that the lifetime prevalence rate for Somatization Disorder is upwards of 2% (American Psychiatric Association [APA], 1994). A viable explanation for this unusual finding relevant to the male participants is that they, like the females, were medical patients being assessed in a primary care facility, and they were older than the average BSI adult nonpatient (psychiatric) norm group participant by nearly 10 years (Derogatis, 1993).

The difference in findings related to the Obsessive-Compulsive dimension are surprising given that the disorder itself tends to be equally common in males and females (American Psychiatric Association [APA], 1994). Future researchers may want to examine factors common to rural living and to older age such as isolation, restricted access to resources, or financial limitations to determine if they or something else produce findings similar to these.

As for the BSI Psychoticism dimension, items used in its construction are associated with symptoms indicative of the class of disorders classified under the heading of "Schizophrenia and Other Psychotic Disorders" found in the DSM-IV (American Psychiatric Association [APA], 1994, p. 19). For the most part, males are generally diagnosed at a slightly higher rate than are women with the illnesses falling within this category of disorders (American Psychiatric Association [APA], 1994), but such was not the case in this study. These results require replication, and if supported, clinical interviews are needed to attempt to better understand the reasons for these results. In addition, a larger sample drawn from a range of rural settings and not

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exclusively from a medical facility is needed to further examine these results. Also, having a larger number of male participants may have produced findings more in line with what typically is found in the general population.

What appears to be inconsistent with previous findings is that none of the significantly higher symptom dimension mean scores for either subgroup were related to the BSI Depression or Anxiety symptom dimensions. Only when the entire group's mean dimension scores were compared to the BSI adult nonpatient norm group was it that the Depression dimension mean score proved to be significantly elevated.

The only symptom dimension mean indicative of psychological distress to be significantly elevated for the entire group and for both subgroups was the mean of the BSI Somatization dimension. This finding was expected, though, given the relatively high average age of participants and the fact that participants were medical patients seeking primary care services.

One of the most baffling findings was that the mean scores for the entire group and for the females on the Obsessive-Compulsive dimension were significantly higher than those of the corresponding BSI norm groups. These results indicate that this sample was experiencing or was at least at an increased risk for significant psychological distress. No other findings from the limited amount of research pertaining to stress-related psychological distress in rural people have even seemed to suggest that obsessive-compulsive symptoms might plague folks living in rural America. This leads to speculation as to whether factors such as age, specific elements unique to rural living, being an individual seeking medical treatment at a primary care

facility, or some combination of these may have yielded these unusual findings.

Certainly, this study did not provide the means for making such determinations, and it might be useful for future researchers to look at these factors and how they relate to the mental health status of rural folks. Such determinations could have important implications for treatment services in rural communities.

General Health

In looking at the physical health of this study's participants, it was found that only the DUHP Symptoms dimension mean for all participants was significantly greater than the mean of that dimension for the norm group to which the results were compared. When the DUHP was developed, the items of the Symptoms dimension were grouped together based on the knowledge that notable changes in any of the dimension's items were associated with the earliest and sometimes the only manifestation of altered health. It has been shown that the number and severity of the changes in those symptoms are often a good indicator of general health status (Parkerson et al., 1981). Furthermore, since patients often present with one or more symptoms, an occurrence which can influence the selection of diagnostic tests run and subsequent type of treatment undertaken, knowledge of symptoms is particularly important to the measurement of outcome in the medical care setting. To be specific, the items of the Symptoms dimension assess for changes in such things as breathing, eyesight, hearing, and speech; variations in one's appetite and abilities to taste, chew, and swallow food; changes in elimination, weight, or sleep patterns; the onset of somatic weakness, fatigue, pain, itching, or headaches; changes in sexual function; and

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the onset of symptoms indicative of depressive or anxious episodes. The findings of this study suggestive of relatively significant pathology in regard to the aforementioned symptoms seem to be consistent with the most prominent symptomatology reported in previous studies of rural participants. For instance, researchers in the past have found such anomalies as chronic fatigue, forgetfulness, changes in concentration and sleep patterns, headaches or back pain, and weight gain or loss to be the most frequently reported stress-related symptoms (Knudsen & Wilson, 1985; Walker & Walker, 1988a).

That this study's participants varied significantly from the norm group on the Symptoms dimension is interesting and could be the product of several factors either singly or in combination. The two samples were similar in that both were patients of a primary care facility, but the similarities ended there. In particular, the facility from which norm group participants were accessed was located in a metropolitan area. In addition, the two groups differed dramatically in age. Specifically, nearly 78% of the people who comprised the normative sample were between the ages of 18 and 50 years. In contrast, almost 62% of this study's participants were 50 years of age or older. Also, there were considerable differences in social class and employment status between the samples. The social class of 52% of the norm group was ranked as "high." Shortcomings in the way social class was assessed in the current sample made it impossible to determine how this study's participants fared socially. However, it is unlikely that they would have ranked very high, as 78% of them were not employed. About 66% of the norm group participants were employed.

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Knowing what contributed to the noted intergroup difference could have implications for the training of professionals and for the treatment of rural patients. Unfortunately, this study was not designed to make such determinations. Therefore, it is recommended that future studies be designed so as to yield the needed information.

Predictions

What was found regarding the predictive value of the stress variables, the REQ absolute total score mean and the REQ Rural Events and Financial Events item category means, was that none of the chosen variables for rural stress predicted physical health, the DUHP Symptoms dimension mean, at an acceptable level of significance. However, financial events did predict mental health, the BSI Global Severity Index mean score, but only for the group as a whole and for the subgroup of women. These female-male differences are again believed to have evolved from the observation that a much higher percentage of women listed themselves as retired and/or unemployed. This would suggest that the female participants were forced more than were their male cohorts to live off fixed incomes and would, therefore, be more likely to find financial matters as stressing. For future research, examining the predictive power of other stress variables for either physical or mental health status could be an informative endeavor. Likewise, it might be beneficial to see if other criterion variables related to physical or mental health status could be predicted by rural stress.

It should be noted that in this study, sample size limitations greatly restricted the range of variables that could be analyzed for purposes related to prediction.

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Therefore, for future research endeavors, it is very important that every effort be made to enlist participation of a much larger number of individuals.

Having looked at how given stressors predicted mental and physical health status for the participants in this study, the focus shifted to determining how well physical health was predicted by mental health. Of the three predictor variables for mental health, the BSI Global Severity Index mean and the Obsessive-Compulsive and Depression symptom dimension means, only obsessive-compulsive symptoms predicted the criterion variable for physical health, the DUHP Symptoms dimension mean, and the prediction was significant again for only the group as a whole and for the subgroup of females. This finding is likely to seem quite remarkable if one assumes that the symptoms assessed by the BSI Obsessive-Compulsive dimension are those generally associated exclusively with the rendering of a psychiatric diagnosis of obsessive-compulsive disorder. However, a close examination of the symptoms comprising this dimension reveals that they are experiences associated, perhaps, more fully with aging such as trouble remembering things, feeling blocked in getting things done, difficulty making decisions, your mind going blank, and problems with concentration. Again, it must be noted that the average age of this group of participants was well over 50 years. It would be interesting to see if the findings from a scale designed to assess symptoms which are strictly in line with DSM-IV criteria for a diagnosis of Obsessive-Compulsive Disorder would yield similar findings. It is recommended, then, that in the future, such scales be utilized in research related to making the aforementioned predictions.

Limitations

This study had a number of limitations, and foremost among them was the inadequacy of the size of the sample. Sample size limitations had a negative impact on virtually every aspect of this study and certainly limit the degree to which the findings can be generalized to rural populations. The small sample size realized was the product of a number of factors. For one, it was estimated that there were about 1500 open medical charts in the primary care facility at which the data was gathered, and it was believed that number would suffice for attainment of a sample size of 250. Without compromising patient confidentiality and over-burdening the staff and resources of the participating primary care facility, there was no way known to accurately determine the number of open patient charts which met the study's criteria for participation of being 18 years of age or older and having a medical chart open for one full year prior to participation. Of those meeting criteria, only a relatively small percentage were receiving ongoing medical treatment, and of those showing up at the clinic on the days when data was to be gathered, only a fraction agreed to participate. Naturally, these factors appreciably narrowed the number of possible participants and greatly constricted the generalizability of the findings.

In addition, problems with the sampling process also constricted the number of viable participants. For instance, the one-way travel time from the sponsoring institution to the participating clinic was between two and three hours. Throughout the study, there were never more than two volunteer student research assistants effectively

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assisting in the data gathering process. Those student assistants had to attend classes many days of the week, and when they were not in class, they often had to work. Given the travel distance, the occasional problems with weather, and the restrictions placed on assistants by their own time commitments, the number of days on which data could be gathered never exceeded two per week. Often there was only one day a week an assistant could find the time to commit to gathering data.

What was also anticipated but not expected in the magnitude experienced was the number of participants who, due to poor eyesight, inability to read, or both, had to have the entire battery of data gathering instruments read to them. With what was usually only one assistant at the clinic on any given day, having to sit in a room and read aloud an entire battery to a participant made it impossible to solicit participation from others who might have arrived at the clinic for services during that time. In retrospect, many of the aforementioned obstacles to data gathering may have been overcome by broadening the data gathering network to include several rural primary care facilities for which the travel time to most did not exceed 30 minutes. Since most research of this type is sponsored by an institution located within a metropolitan statistical area, finding eligible clinics located within a short drive with staff willing to involve their resources in such research is likely to be a daunting, if not impossible, task. Also, employing many more assistants than were used in this study is likely to be a must, and the longer the travel time, the more likely it is that the process will require even greater numbers.

Another factor which may have affected the findings of this study was the inconsistency in which the battery of data gathering instruments was administered. Having some batteries read to participants by assistants while others were completed by the participants themselves quite likely increased error size. As well, using instruments with subscales having low construct validity possibly limited the amount of assuredness that the findings were an accurate representation of what was intended to be measured. Several subscales of instruments used in this study had limited construct validity.

The lack of randomization in the selection of participants has long been known to compromise the reliability and validity of findings. In this study, all participation was solicited, and variations in the style used by assistants in the solicitation process could have increased sampling error.

The problems with self-report measures have been discussed at length in the literature (Sarason et al., 1978). Given that such measures were used in this study, the problems inherent to their use were likely to have impacted the amount of error in the results.

The length of time needed to complete the battery of instruments used in this study was 45 minutes. This seemed too burdensome for many participants in that several of them refused to participate once they found out how long it would take for them to complete everything. Several others who did agree to participate, turned in their batteries incomplete reporting they were not up to such a lengthy task.

Future Research Needs

To counter the aforementioned shortcomings of this study for which remedies have not already been proffered, it is suggested that future researchers attempt a number of things. First, greater participation could be gained by finding ways of shortening the task presented to prospective participants. This could be done by limiting the subscales used on each instrument to those which have no less than good construct validity. Solicitation of participants by those in charge of that task must be uniform. Likewise, the administration of batteries used in data gathering must be performed in a consistent manner. Both of these endeavors could be achieved by thoroughly training all assistants in the specific techniques of solicitation and administration to be used and assigning one assistant to each specific task for each clinic at which data is to be gathered. This would require the presence of a minimum of two assistants at each clinic for every day of data collection. Of course, this assumes that more than one site would be used in the data gathering process, and based on the limitations imposed by reliance on only one data gathering site, it is highly recommended that several such sites be enlisted in similar studies. By adhering to the preceding recommendations, the number of participants and sample variability would be significantly increased. Of course, participation procured through a random sampling technique would also enhance the generalizability of results, and the need for this to be used in future studies cannot be emphasized enough.

The literature and the results of this study both suggest that a considerable number of people who are illiterate or cannot read due to physical limitations are likely

to serve as participants for this type of research. It is suggested, therefore, that batteries be read aloud to all participants. This could help to assure uniformity in the process of administration and would constrict the limitations inherent in self-report measures. In addition, this technique would facilitate follow-up questioning designed to yield findings more revealing of the true relationships of the constructs being studied.

Researchers need to be aware of the roles played by etiological and associative factors in confounding the data they gather. For instance, such factors as aging and the physical and cognitive limitations so commonly associated with it could produce results that could be easily misconstrued as the effects of other variables. Thus, researchers are encouraged to utilize techniques such as follow-up interviews to help clarify if findings are actually the result of specific symptoms pertaining to mental or physical health or are more likely the product of things like reading deficits, poor vision, illiteracy, memory impairment, concentration problems, or any other of the many sequelae of the aging process. As well, it is recommended that researchers statistically control for confounding variables such as age, employment status, retirement, occupation, and other related phenomena. It is clear from this and past studies that factors related to aging are very likely to impact those working in rural settings regardless of whether they function in the role of researcher or practitioner.

Certainly, the medical diagnosis of each participant must be taken into account. Investigators could benefit from developing a more thorough understanding of the role it plays in physical and mental health findings are encouraged to incorporate into their

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designs a method for documenting it and its known or likely effects on mental and physical health functioning.

There are events or experiences that are common to people living in either rural or urban environments. Ergo, it seems imperative that researchers employ statistical techniques and other tools they have in their command to more thoroughly ascertain those experiences which are commonly shared and determine the degree to which each affects rural and urban residents differentially. In a similar vein, events such as the effects of weather patterns on livestock, crops, harvest, and markets do seem uniquely rural. Knowing the amount of stress produced by these and other such events and the degree to which these unique experiences impact mental and physical health could yield a better understanding of the actual health care needs of those in rural areas. With such knowledge, health care providers could receive the type of training which would enable them to deliver services more appropriately designed to meet the needs of rural Americans.

Conclusions

This study was inspired by the reality that little is known about the interplay of stress in the physical and mental health of rural Americans. Without a clearer understanding of how these factors are related, the health needs of rural dwellers cannot be adequately addressed.

To fulfill the purpose for which this study was designed, data was gathered from 32 female and 18 male rural primary care patients. As it turned out, the average age of the participants was about 56 years. This finding proved not too surprising

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given that a disproportionate number of America's elderly now reside in rural areas and utilize medical services.

The first quest of this study was to yield some information regarding the nature of the stress being experienced by the study's participants. It was found that the most stressful events were those pertaining to the health of oneself and others, a lack of guaranteed income, and the death of a friend. When items were grouped into categories of stressors, events deemed most unique to rural living produced the greatest relative stress. Among these events were isolation from others due to weather and distance; the effects of weather on crops and the crop market, livestock and the livestock market, and harvest, field work, and/or planting; insufficient community resources; a varied or inconsistent work schedule; working and living on a ranch or farm; and the effects of hunting season. Previous studies have yielded similar findings. Thus, research on stress in rural populations needs to include specific measures of rural events and issues.

Psychological symptoms of stress were also examined. The findings revealed that the female subgroup harbored more symptomatology on three of the BSI symptom dimensions and the Global Severity Index than did the norm group to which their scores were compared. By comparison, the men scored significantly different from their corresponding norm group on only one dimension. The BSI Somatization dimension was the only subscale on which both subgroups endorsed significant levels of symptomatology. This finding seemed to make sense when viewed in light of the fact that this study's participants were primary care patients being seen for medical

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concerns and that their average age exceeded that of the norm group by nearly 10 years. One baffling finding was that the BSI Obsessive-Compulsive dimension mean scores for the entire sample and for the female subgroup were higher than those of the respective norm groups. While this study was not designed to determine which factors may have played a significant role in these occurrences, it may be that the symptoms measured by the Obsessive-Compulsive scale of the BSI actually assess symptoms related to memory, concentration, or indecision common among older medically ill people. Thus, future researchers could provide substantial clarification for this conundrum by ferreting out the specific roles of those factors and shedding some light on how they relate to the mental health status of rural dwellers. Finally, if future research supports the overall high level of psychological distress found in this sample, then this population of older rural primary care patients may be targeted as a group in need of greater accessibility to mental health professionals with special training for working with this population.

With the focus shifted to making determinations about general health, it was found that significant score elevations were realized on the DUHP Symptoms dimension. The array of symptoms comprising this particular dimension were consistent with those cited in the literature as most problematic for rural people. However, it seems likely that differences inherent of rural and urban lifestyles, as well as, age, social class, and employment status may have contributed to this subscale elevation. Thus, researchers in the future are encouraged to use follow-up interviews or statistical control procedures to ferret out the confounding effects of etiological,

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demographic, and other associative factors. As well, the apparently high level of symptoms of poor health in this rural, older, primary care sample deserves further examination. These results may indicate this is a population at increased risk for poor health from a variety of conditions and thus in need of greater access to both primary care and specialty care services. With this in mind, it seems imperative that more attention be given to medical diagnosis and the role it may play in the findings of research similar to that undertaken in this study.

A determination of whether rural stress predicted physical health and/or mental health was the next task of this project. Three predictor variables for stress, the REQ absolute total score and the means from the REQ Financial Events and Rural Events categories, were chosen. The criterion variables chosen for general physical health and for psychological distress were the DUHP Symptoms dimension mean and the BSI Global Severity Index mean, respectively. No stress variables predicted general physical health, and the REQ Financial Events mean predicted psychological distress but only for the group as a whole and for the subgroup of women. The higher unemployment and retirement rates for the women in this study were cited as likely factors contributing to this finding.

Finally, the focus shifted to seeing if physical health was predicted by mental health. The three predictor variables for mental health were the BSI Global Severity Index mean and the means for the BSI Obsessive-Compulsive and Depression dimensions. The criterion variable for physical health was again the DUHP Symptoms dimension mean. Only obsessive-compulsive symptoms predicted physical health, but

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this prediction held up for just the group as a whole and for the female subgroup. A close look at the symptoms comprising the BSI Obsessive-Compulsive dimension revealed that such a finding may not have been realized if those symptoms had not, perhaps, been more closely related to experiences often noted as sequelae of aging and medical illness.

While these results are limited by the size and nature of the sample, there is evidence to suggest this rural, mostly older primary care population may experience poorer general health and greater psychological distress than the general population and may have very different needs from urban and younger primary care patients. There is also indication that issues specifically related to rurality have a large impact on the lives and concerns of rural people. These issues need to be better understood, and health care professionals, including psychologists and other mental health workers may need special training and experience in order to most effectively relate with and serve the needs of rural people.

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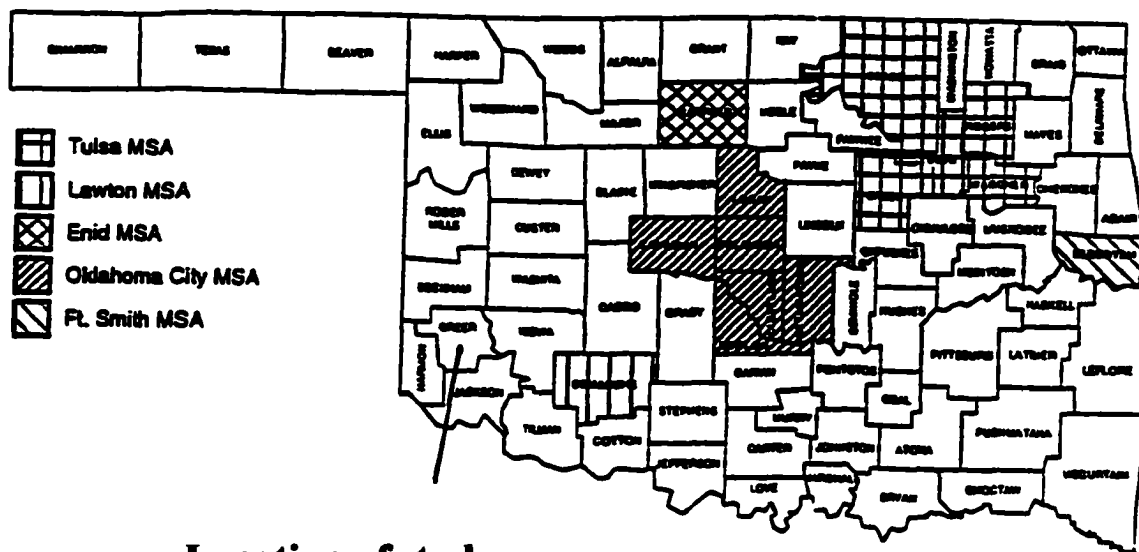
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Appendix A

Map Showing Metropolitan Statistical Areas of Oklahoma

MAP 1.01

Metropolitan Statistical Areas



Location of study

Statistical Abstract of Oklahoma. (1994). Norman, OK: Center for Economic and Management Research, College of Business Administration, University of Oklahoma and Oklahoma Department of Commerce.

Appendix B

Tables Pertaining to the Demographics of the Study's Rural Participants

Table B1

Demographics of Rural Participants Pertaining to Age by Sex

Age range	# of females // %*	# of males // %*	# of all participants // %*
18 - 29	5 // 15.6	2 // 11.1	7 // 14.0
30 - 39	2 // 6.3	0 // 0.0	2 // 4.0
40 - 49	5 // 15.6	5 // 27.8	10 // 20.0
50 - 59	2 // 6.3	5 // 27.8	7 // 14.0
60 - 69	6 // 18.8	0 // 0.0	6 // 12.0
70 - 79	10 // 31.3	5 // 27.8	15 // 30.0
80 - 86	2 // 6.3	1 // 5.5	3 // 6.0
Totals	32	18	50

* all percentages have been rounded to the nearest tenth

Table B2

Demographics of Rural Participants Pertaining to Race by Sex

Race	Females*	Males**	% of all participants
American Indian	1	2	6.0
Asian	0	0	0.0
Black	0	0	0.0
Mexican American	3	0	6.0
White	28	16	88.0

* $n = 32$ ** $n = 18$

Table B3

Demographics of Rural Participants Pertaining to Education by Sex

Years of education	Females*	Males**	% of all participants	Cumulative percent
not indicated	3	0	6.0	6.0
7	0	1	4.0	8.0
8	2	3	10.0	18.0
9	2	0	4.0	22.0
10	2	0	4.0	26.0
11	2	0	4.0	30.0
12	10	8	36.0	66.0
13	3	0	6.0	72.0
14	3	2	10.0	82.0
15	4	1	10.0	92.0
16	1	1	4.0	96.0
17	0	1	2.0	98.0
20	0	1	2.0	100.0

* $n = 32$ ** $n = 18$

Table B4

Demographics of Rural Participants Pertaining to Marital Status by Sex

Marital status	# of females // %* (n = 32)	# of males // %* (n = 18)	% of all participants
Married	16 // 50.0	13 // 72.2	58.0
Divorced	5 // 15.6	2 // 11.1	14.0
Separated	2 // 6.3	1 // 5.6	6.0
Single	2 // 6.3	2 // 11.1	8.0
Widowed	7 // 21.8	0 // 0.0	14.0

* all percentages have been rounded to the nearest tenth

Table B5

Demographics of Rural Participants Pertaining to Employment Status by Sex

Employment status	# of females // %* (n = 32)	# of males // %* (n = 18)	# of all participants // %*
Employed	2 // 6.3	9 // 50.0	11 // 22.0
Retired	18 // 56.3	6 // 33.3	24 // 48.0
Unemployed	12 // 37.5	3 // 16.7	15 // 30.0

* all percentages have been rounded to the nearest tenth

Table B6

Participants' Tobacco and Alcohol Use by Sex

Any used	Females*			Males**		
	Cigarettes # of females/%	Smokeless Tobacco # of females/%	Alcohol # of females/%	Cigarettes # of males/%	Smokeless Tobacco # of males/%	Alcohol # of males/%
Yes	7 / 21.9	0 / 0.0	5 / 15.6	4 / 22.2	4 / 22.2	5 / 27.8
No	23 / 71.9	23 / 71.9	24 / 75.0	14 / 77.8	9 / 50.0	12 / 66.7
No answer	2 / 6.3	9 / 28.1	3 / 9.4	0 / 0.0	5 / 27.8	1 / 5.6
* n = 32			** n = 18			

Appendix C

**Tables Pertaining to the Nature of Stress in the Study's Rural Participants
as Measured by the REQ**

Table C1

REQ Item Positive, Negative, and Absolute Total Scores:
and REQ Total Positive, Total Negative, and Absolute Total Scores

REQ Item	Item (+) Score	Item (-) Score	Item Absolute Score	REQ Item	Item (+) Score	Item (-) Score	Item Absolute Score	REQ Item	Item (+) Score	Item (-) Score	Item Absolute Score
1	13	4	17	28	16	2	18	55	9	0	9
2	22	1	23	29	12	6	18	56	2	0	2
3	14	7	21	30	4	4	8	57	3	0	3
4	5	0	5	31	0	4	4	58	0	0	0
5	4	8	12	32	0	3	3	59	4	13	17
6	2	3	5	33	0	4	4	60	5	6	11
7	3	3	6	34	5	0	5	61	6	9	15
8	5	1	6	35	0	8	8	62	9	13	22
9	6	0	6	36	14	17	31	63	3	11	14
10	6	6	12	37	15	17	32	64	9	14	23
11	0	4	4	38	4	3	7	65	3	16	19
12	1	0	1	39	9	7	16	66	6	14	20
13	2	4	6	40	6	13	19	67	11	3	14
14	2	2	4	41	0	8	8	68	9	6	15
15	0	2	2	42	16	3	19	69	3	2	5
16	0	1	1	43	1	0	1	70	7	5	12
17	8	7	15	44	9	5	14	71	17	4	21
18	13	13	26	45	0	4	4	72	19	4	23
19	4	5	9	46	1	6	7	73	16	14	30
20	2	5	7	47	2	0	2	74	4	0	4
21	1	0	1	48	0	4	4	75	12	0	12
22	3	4	7	49	6	19	25	76	6	5	11
23	7	11	18	50	3	0	3	77	4	0	4
24	10	21	31	51	4	0	4	78	9	2	11
25	13	2	15	52	0	0	0	79	6	2	8
26	6	0	6	53	0	0	0	80	3	5	8
27	4	2	6	54	8	11	19				

Total Positive Score = 476

Total Negative Score = -412

Absolute Total Score = 888

Table C2

REQ Item Category Mean Absolute Total Score and Standard Deviation

REQ Item Category	Item Category Total Score Mean	Item Category Standard Deviation
Work-Related Events*	10.64	6.90
Financial Events*	9.07	7.65
Living Conditions*	8.38	6.14
Family-Related Events*	11.80	9.85
Relationship Events*	7.45	8.85
Rural Events*	16.46	5.43
Miscellaneous Events*	11.00	8.26

- * Work-Related Events category is comprised of Items 1 through 11.
- Financial Events category is comprised of Items 12 through 25.
- Living Conditions category is comprised of Items 26 through 33.
- Family-Related Events category is comprised of Items 34 through 48.
- Relationship Events category is comprised of Items 49 through 59.
- Rural Events category is comprised of Items 60 through 72.
- Miscellaneous Events is comprised of Items 73 through 80.

Table C3

REQ Item Category Mean Total Positive Score and Standard Deviation

REQ Item Category	Item Category Positive Score Mean	Item Category Standard Deviation
Work-Related Events*	7.27	6.47
Financial Events*	4.93	4.95
Living Conditions*	5.25	5.95
Family-Related Events*	5.47	5.82
Relationship Events*	3.55	3.11
Rural Events*	8.23	5.05
Miscellaneous Events*	7.50	4.54

- * Work-Related Events category is comprised of Items 1 through 11.
 Financial Events category is comprised of Items 12 through 25.
 Living Conditions category is comprised of Items 26 through 33.
 Family-Related Events category is comprised of Items 34 through 48.
 Relationship Events category is comprised of Items 49 through 59.
 Rural Events category is comprised of Items 60 through 72.
 Miscellaneous Events is comprised of Items 73 through 80.

Table C4

REQ Item Category Mean Total Negative Score and Standard Deviation

REQ Item Category	Item Category Negative Score Mean	Item Category Standard Deviation
Work-Related Events*	3.36	2.77
Financial Events*	4.14	3.90
Living Conditions*	3.13	1.81
Family-Related Events*	6.33	5.56
Relationship Events*	3.91	6.95
Rural Events*	8.23	4.83
Miscellaneous Events*	3.50	4.72

- * Work-Related Events category is comprised of Items 1 through 11.
 Financial Events category is comprised of Items 12 through 25.
 Living Conditions category is comprised of Items 26 through 33.
 Family-Related Events category is comprised of Items 34 through 48.
 Relationship Events category is comprised of Items 49 through 59.
 Rural Events category is comprised of Items 60 through 72.
 Miscellaneous Events is comprised of Items 73 through 80.

Table C5

REQ* Item Category Correlational Matrix

	REQWRK	REQFIN	REQLIV	REQFAM	REQREL	REQRUR	REQMISC
REQWRK	1.00000 0.0000	0.77570 0.0001	0.57879 0.0796	0.35986 0.1877	0.45256 0.0903	0.48159 0.0589	0.73362 0.0066
REQFIN	0.77570 0.0001	1.00000 0.0000	0.65047 0.0047	0.61063 0.0012	0.54168 0.0112	0.60735 0.0010	0.72408 0.0002
REQLIV	0.57879 0.0796	0.65047 0.0047	1.00000 0.0000	0.54490 0.0357	0.13573 0.6584	0.43123 0.1412	0.49148 0.1046
REQFAM	0.35986 0.1877	0.61063 0.0012	0.54490 0.0357	1.00000 0.0000	0.45660 0.0654	0.46654 0.0248	0.69205 0.0007
REQREL	0.45256 0.0903	0.54168 0.0112	0.13573 0.6584	0.45660 0.0654	1.00000 0.0000	0.82221 0.0001	0.77569 0.0007
REQRUR	0.48159 0.0589	0.60735 0.0010	0.43123 0.1412	0.46654 0.0248	0.82221 0.0001	1.00000 0.0000	0.81763 0.0001
REQMISC	0.73362 0.0066	0.72408 0.0002	0.49148 0.1046	0.69205 0.0007	0.77569 0.0007	0.81763 0.0001	1.00000 0.0000

* Rural Experiences Questionnaire (REQ) item category abbreviations:
 REQWRK = Work-Related Events; REQFIN = Financial Events;
 REQLIV = Living Conditions; REQFAM = Family-Related Events;
 REQREL = Relationship Events; REQRUR = Rural Events;
 REQMISC = Miscellaneous Events

Appendix D

**Tables Pertaining to the Nature of Psychological Symptoms of Distress
in the Study's Rural Participants as Measured by the BSI**

Table D1

BSI* Female Participants' Ages and Symptom Dimension and GSI T-scores

Age	Dimension T-score									
	BSISOM	BSIO-C	BSII-S	BSIDEP	BSIANX	BSIHOS	BSIPHOB	BSIPAR	BSIPSY	BSIGSI
<u>19</u>	41	38	<u>65</u>	42	38	59	45	<u>63</u>	62	52
23	41	38	41	42	38	39	45	52	46	33
<u>26</u>	<u>63</u>	59	41	61	38	59	<u>64</u>	<u>63</u>	<u>65</u>	60
27	41	38	41	42	48	51	45	43	46	43
<u>28</u>	59	49	54	61	59	<u>67</u>	45	55	<u>65</u>	60
<u>32</u>	<u>68</u>	<u>68</u>	41	42	38	39	<u>63</u>	43	<u>65</u>	60
<u>38</u>	<u>70</u>	<u>70</u>	61	<u>64</u>	<u>71</u>	<u>78</u>	<u>73</u>	<u>71</u>	<u>80</u>	<u>77</u>
40	64	48	41	42	48	39	56	43	46	49
<u>43</u>	<u>73</u>	<u>74</u>	<u>80</u>	<u>75</u>	<u>71</u>	<u>72</u>	45	<u>67</u>	<u>78</u>	<u>78</u>
<u>43</u>	<u>75</u>	<u>78</u>	<u>71</u>	<u>70</u>	<u>70</u>	<u>68</u>	<u>65</u>	<u>71</u>	<u>75</u>	<u>74</u>
<u>43</u>	<u>77</u>	<u>68</u>	<u>76</u>	<u>72</u>	<u>70</u>	<u>72</u>	45	<u>73</u>	<u>74</u>	<u>74</u>
47	53	58	41	57	49	55	45	52	62	56
<u>52</u>	<u>63</u>	<u>64</u>	<u>69</u>	61	<u>66</u>	62	45	<u>67</u>	<u>65</u>	<u>65</u>
<u>57</u>	<u>80</u>	<u>78</u>	<u>76</u>	<u>71</u>	<u>75</u>	<u>72</u>	<u>76</u>	<u>71</u>	<u>78</u>	<u>80</u>
62	63	53	61	52	49	51	45	59	47	56
64	59	61	55	57	59	55	56	61	64	60
66	46	49	41	42	38	38	45	52	46	43
67	63	61	41	57	59	59	45	43	62	60
68	46	49	41	42	38	39	45	43	46	43
<u>69</u>	<u>80</u>	<u>68</u>	<u>69</u>	61	<u>66</u>	55	<u>67</u>	61	62	<u>69</u>
<u>71</u>	<u>76</u>	<u>68</u>	55	52	59	51	<u>63</u>	43	58	<u>63</u>
<u>72</u>	<u>80</u>	<u>77</u>	61	51	<u>64</u>	55	45	61	46	<u>65</u>
<u>72</u>	49	61	61	<u>71</u>	<u>63</u>	51	45	43	62	61
<u>72</u>	<u>69</u>	<u>71</u>	<u>63</u>	<u>68</u>	<u>70</u>	55	<u>68</u>	59	<u>67</u>	<u>70</u>
<u>72</u>	<u>73</u>	<u>68</u>	55	<u>68</u>	<u>64</u>	51	45	52	46	<u>64</u>
<u>74</u>	59	<u>64</u>	<u>65</u>	51	55	59	56	61	<u>67</u>	61
75	53	54	41	42	38	39	45	43	46	43
75	41	49	41	42	55	39	45	43	46	49
<u>78</u>	<u>68</u>	38	41	42	49	39	45	43	<u>64</u>	52
<u>78</u>	<u>66</u>	53	41	42	55	39	45	52	<u>64</u>	56
<u>80</u>	<u>63</u>	<u>64</u>	41	47	48	39	45	43	46	52
<u>86</u>	41	<u>68</u>	<u>65</u>	<u>67</u>	62	39	<u>67</u>	43	58	<u>64</u>

* Brief Symptom Inventory (BSI) abbreviations: BSISOM = Somatization; BSIO-C = Obsessive-Compulsive; BSII-S = Interpersonal Sensitivity; BSIDEP = Depression; BSIANX = Anxiety; BSIHOS = Hostility; BSIPHOB = Phobic Anxiety; BSIPAR = Paranoid Ideation; BSIPSY = Psychoticism; BSIGSI = Global Severity Index

Note 1: Ages of participants who met the BSI operational definition of caseness (someone with a positive diagnosis) have been italicized and underlined (Positive Dx = TGSI $\geq$ T63 or T2DIM $\geq$ T63) (Derogatis, 1993).

Note 2: Symptom Dimension T-scores: Range: 38 through 80; μ = 56.01; S = 12.01

Note 3: Global Severity Index (GSI) T-scores: Range: 33 through 80; μ = 59.13; S = 11.39

Table D2

BSI* Male Participants' Ages and Symptom Dimension and GSI T-scores

Dimension T-score										
Age	BSISOM	BSIO-C	BSII-S	BSIDEP	BSIANX	BSIHOS	BSIPHOB	BSIPAR	BSIPSY	BSIGSI
<u>18</u>	59	60	<u>71</u>	<u>71</u>	<u>76</u>	<u>71</u>	<u>68</u>	56	<u>74</u>	<u>72</u>
<u>19</u>	<u>74</u>	<u>70</u>	59	60	<u>64</u>	<u>71</u>	47	<u>64</u>	62	<u>67</u>
40	49	51	44	44	53	57	47	51	46	51
<u>41</u>	<u>67</u>	<u>69</u>	<u>80</u>	<u>78</u>	<u>74</u>	<u>71</u>	<u>72</u>	<u>75</u>	<u>77</u>	<u>80</u>
42	56	39	44	44	41	51	47	42	46	45
<u>45</u>	<u>67</u>	<u>69</u>	<u>80</u>	<u>78</u>	<u>78</u>	57	<u>80</u>	<u>75</u>	<u>77</u>	<u>80</u>
<u>46</u>	<u>80</u>	<u>69</u>	<u>71</u>	<u>80</u>	<u>68</u>	60	<u>64</u>	59	<u>74</u>	<u>75</u>
52	42	51	44	55	41	40	64	43	46	45
56	59	39	44	44	59	40	47	42	46	51
<u>59</u>	<u>63</u>	60	44	44	53	40	47	<u>64</u>	58	59
<u>59</u>	42	60	59	<u>65</u>	53	52	61	<u>67</u>	<u>66</u>	61
59	49	55	44	60	53	40	47	56	66	55
75	62	39	44	44	64	40	61	42	46	51
<u>76</u>	<u>78</u>	<u>71</u>	<u>70</u>	<u>65</u>	<u>64</u>	60	<u>72</u>	59	46	<u>72</u>
<u>77</u>	<u>78</u>	<u>80</u>	<u>80</u>	<u>80</u>	<u>80</u>	<u>66</u>	<u>80</u>	<u>80</u>	<u>77</u>	<u>80</u>
77	49	51	44	44	41	40	47	51	46	45
77	59	51	64	54	41	40	47	51	46	51
<u>80</u>	<u>74</u>	<u>74</u>	<u>80</u>	<u>80</u>	<u>74</u>	<u>76</u>	<u>71</u>	<u>67</u>	62	<u>80</u>

* Brief Symptom Inventory (BSI) abbreviations: BSISOM = Somatization; BSIO-C = Obsessive-Compulsive; BSII-S = Interpersonal Sensitivity; BSIDEP = Depression; BSIANX = Anxiety; BSIHOS = Hostility; BSIPHOB = Phobic Anxiety; BSIPAR = Paranoid Ideation; BSIPSY = Psychoticism; BSIGSI = Global Severity Index

Note 1: Ages of participants who met the BSI operational definition of caseness (someone with a positive diagnosis) have been italicized and underlined (Positive Dx = TGS1 ≥ T63 or T2DIM ≥ T63) (Derogatis, 1993).

Note 2: Symptom Dimension T-scores: Range: 39 through 80; $\mu = 58.91$; $S = 13.09$

Note 3: Global Severity Index T-scores: Range: 45 through 80; $\mu = 62.22$; $S = 13.50$

Table D3

**Mean T-score and Standard Deviation by BSI* Symptom Dimension and GSI
for Female and Male Participant Subsets**

Symptom Dimension	Female		Male	
	Mean T-score	T-score Standard Deviation	Mean T-score	T-score Standard Deviation
BSISOM	61.34	12.80	61.50	12.22
BSIO-C	59.50	12.03	58.78	12.61
BSII-S	54.25	13.19	59.22	15.33
BSIDEP	54.88	11.52	60.56	14.57
BSIANX	55.31	11.97	59.83	13.56
BSIHOS	52.66	12.15	54.00	13.22
BSIPHOB	52.31	10.32	59.39	12.49
BSIPAR	54.34	10.54	58.00	12.00
BSIPSY	59.50	11.16	58.94	13.04
BSIGSI	59.13	11.39	62.22	13.50

* Brief Symptom Inventory (BSI) abbreviations: BSISOM = Somatization;
BSIO-C = Obsessive-Compulsive; BSII-S = Interpersonal Sensitivity; BSIDEP = Depression;
BSIANX = Anxiety; BSIHOS = Hostility; BSIPHOB = Phobic Anxiety; BSIPAR = Paranoid Ideation;
BSIPSY = Psychoticism; BSIGSI = Global Severity Index

Table D4

**BSI* Symptom Dimension and GSI Female Sample Mean and Norm Group Adult
Nonpatient Female Mean Comparisons Using Student's *t* for Two-Tailed Test**

BSI Symptom Dimension	BSI Symptom Dimension Mean for Females	BSI Symptom Dimension Standard Deviation for Females	BSI Norm Group Mean for Females	BSI Symptom Dimension <i>t</i> for Females
BSISOM	1.135000	0.966710	.35	4.593548 ¹
BSIO-C	1.189063	0.942448	.48	4.256004 ²
BSII-S	0.796875	1.044258	.40	2.149914
BSIDEP	0.776250	0.945965	.36	2.489167
BSIANX	0.890625	0.906065	.44	2.813395
BSIHOS	0.531250	0.715919	.36	1.353136
BSIPHOB	0.382813	0.680442	.22	1.353541
BSIPAR	0.581250	0.691626	.35	1.891408
BSIPSY	0.643750	0.815549	.17	3.286048 ³
BSIGSI	0.794375	0.723856	.35	3.472742 ⁴

* Brief Symptom Inventory (BSI) abbreviations: BSISOM = Somatization;
BSIO-C = Obsessive-Compulsive; BSII-S = Interpersonal Sensitivity; BSIDEP = Depression;
BSIANX = Anxiety; BSIHOS = Hostility; BSIPHOB = Phobic Anxiety; BSIPAR = Paranoid Ideation;
BSIPSY = Psychoticism; BSIGSI = Global Severity Index

¹ $p < .000034$

² $p < .000089$

³ $p < .0013$

⁴ $p < .00077$

Table D5

**BSI* Symptom Dimension and GSI Male Sample Mean and Norm Group Adult
Nonpatient Male Mean Comparisons Using Student's *t* for Two-Tailed Test**

BSI Symptom Dimension	BSI Symptom Dimension Mean for Males	BSI Symptom Dimension Standard Deviation for Males	BSI Norm Group Mean for Males	BSI Symptom Dimension <i>t</i> for Males
BSISOM	0.753889	0.671654	.23	3.309251 ¹
BSIO-C	0.861111	0.782138	.37	2.663990
BSII-S	0.861111	0.997136	.24	2.642719
BSIDEP	0.769444	0.833254	.21	2.848499
BSIANX	0.758333	0.754073	.26	2.803772
BSIHOS	0.577778	0.675239	.34	1.493998
BSIPHOB	0.566667	0.818176	.11	2.368039
BSIPAR	0.805556	0.782509	.33	2.578388
BSIPSY	0.544444	0.608974	.15	2.748041
BSIGSI	0.717778	0.648859	.25	3.058619

* Brief Symptom Inventory (BSI) abbreviations: BSISOM = Somatization;
 BSIO-C = Obsessive-Compulsive; BSII-S = Interpersonal Sensitivity; BSIDEP = Depression;
 BSIANX = Anxiety; BSIHOS = Hostility; BSIPHOB = Phobic Anxiety; BSIPAR = Paranoid Ideation;
 BSIPSY = Psychoticism; BSIGSI = Global Severity Index

¹ $p < .0021$

Table D6

**BSI* Symptom Dimension and GSI Sample Mean and Norm Group Adult
Nonpatient Mean Comparisons Using Student's *t* for Two-Tailed Test**

BSI Symptom Dimension	BSI Symptom Dimension Mean	BSI Symptom Dimension Standard Deviation	BSI Norm Group Mean	BSI Symptom Dimension <i>t</i>
BSISOM	0.9978	0.8842460	.29	5.660079 ¹
BSIO-C	1.071	0.8941197	.43	5.069293 ²
BSII-S	0.82	1.0177506	.32	3.473871 ³
BSIDEP	0.843	0.8489832	.28	4.689152 ⁴
BSIANX	0.548	0.6949497	.35	2.014637
BSIHOS	0.449	0.7301447	.35	0.958763
BSIPHOB	0.662	0.7258746	.17	4.792791 ⁵
BSIPAR	0.608	0.7428132	.34	2.551175
BSIPSY	1.0498	2.1824490	.15	2.915324
BSIGSI	0.7668	0.6920524	.30	4.769544 ⁶

* Brief Symptom Inventory (BSI) abbreviations: BSISOM = Somatization;
 BSIO-C = Obsessive-Compulsive; BSII-S = Interpersonal Sensitivity; BSIDEP = Depression;
 BSIANX = Anxiety; BSIHOS = Hostility; BSIPHOB = Phobic Anxiety; BSIPAR = Paranoid Ideation;
 BSIPSY = Psychoticism; BSIGSI = Global Severity Index

¹ $p < .00000039$

² $p < .000003$

³ $p < .00054$

⁴ $p < .00001$

⁵ $p < .000008$

⁶ $p < .000008$

Appendix E

**Table Pertaining to the Nature of the General Health
of the Study's Rural Participants as Measured by the DUHP**

Table E1

DUHP* Dimension Sample Mean and Norm Group Mean Comparisons
Using Student's *t* for Two-Tailed Test

DUHP Dimension	DUHP Dimension Mean	DUHP Dimension Standard Deviation	DUHP Norm Group Mean	DUHP Dimension <i>t</i>
DUHPSYM	0.758	0.115846	.84	5.005158 ¹
DUHPSOC	0.68	0.203038	.74	2.08958
DUHPPHY	0.6654	0.16643	.72	2.319776
DUHPEMT	0.7256	0.131881	.77	2.380596

* Duke-UNC Health Profile (DUHP) subscale abbreviations: DUHPSYM = Symptoms;
 DUHPSOC = Social; DUHPPHY = Physical; DUHPEMT = Emotional

¹ $p < .000004$

Appendix F

**Tables Showing Rural Stress-Psychological Symptoms of Distress
and Rural Stress-General Health Correlations
for the Study's Rural Participants**

Table F1

***Correlation Analysis of REQ* Item Category Absolute Total Score Means to
BSI** Symptom Dimension and GSI Score Means for All Participants***

	REQWRK	REQFIN	REQLIV	REQFAM	REQREL	REQRUR	REQMISC
BSISOM	-0.07731 0.7324	0.12622 0.4840	-0.16351 0.5306	-0.21021 0.2564	-0.18234 0.3938	-0.14070 0.4583	-0.21914 0.2625
BSIO-C	0.01954 0.9312	0.00740 0.9674	-0.30866 0.2280	-0.32490 0.0745	-0.26519 0.2104	-0.06480 0.7337	-0.20855 0.2869
BSII-S	-0.02152 0.9243	-0.17850 0.3203	-0.17600 0.4992	-0.28863 0.1153	0.00180 0.9933	0.11640 0.5402	0.11813 0.5494
BSIDEP	0.00160 0.9944	0.11774 0.5140	0.01218 0.9630	-0.26937 0.1428	-0.01647 0.9391	0.02347 0.9020	-0.02601 0.8955
BSIANX	0.38254 0.0789	0.43983 <u>0.0104</u>	0.49307 <u>0.0443</u>	-0.05348 0.7751	0.12668 0.5553	0.20805 0.2699	0.21652 0.2684
BSIHOS	-0.03213 0.8871	0.14323 0.4265	0.10274 0.6948	-0.14193 0.4463	-0.27882 0.1870	-0.13398 0.4803	-0.09046 0.6471
BSIPHOB	0.18608 0.4070	0.34131 <u>0.0519</u>	0.31542 0.2175	-0.10475 0.5749	0.00752 0.9722	0.08166 0.6679	0.14518 0.4611
BSIPAR	0.09571 0.6718	0.27027 0.1282	0.14188 0.5870	-0.25270 0.1702	-0.05107 0.8127	0.03395 0.8586	0.03437 0.8622
BSIPSY	0.05494 0.8081	-0.03490 0.8471	-0.21877 0.3989	-0.31870 0.0806	0.00132 0.9951	0.16271 0.3903	-0.09526 0.6297
BSIGSI	0.04748 0.8338	0.19432 0.2785	-0.00188 0.9943	-0.28157 0.1249	-0.12562 0.5586	-0.00629 0.9737	-0.04523 0.8192

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** Brief Symptom Inventory (BSI) abbreviations: BSISOM = Somatization;
BSIO-C = Obsessive-Compulsive; BSII-S = Interpersonal Sensitivity;
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BSIPHOB = Phobic Anxiety; BSIPAR = Paranoid Ideation;
BSIPSY = Psychoticism; BSIGSI = Global Severity Index

Table F2

***Correlation Analysis of REQ* Item Category Absolute Total Score Means to
BSI** Symptom Dimension and GSI Score Means for Female Participants***

	REQWRK	REQFIN	REQLIV	REQFAM	REQREL	REQRUR	REQMISC
BSISOM	0.12248 0.6766	0.47358 <u>0.0301</u>	0.27959 0.4050	0.06143 0.8087	-0.17352 0.5054	0.21644 0.4207	0.04553 0.8772
BSIO-C	0.05933 0.8403	0.36835 0.1004	0.11245 0.7420	-0.11376 0.6531	-0.56193 <u>0.0189</u>	0.26413 0.3229	-0.10770 0.7140
BSII-S	0.04745 0.8720	0.33671 0.1356	-0.08399 0.8061	-0.27291 0.2732	-0.58047 <u>0.0146</u>	0.33956 0.1982	0.46703 0.0922
BSIDEP	0.10825 0.7126	0.56499 <u>0.0076</u>	0.03371 0.9216	-0.12717 0.6151	-0.46467 0.0602	0.24562 0.3592	0.09791 0.7391
BSIANX	0.05885 0.8416	0.79923 <u>0.0001</u>	0.45730 0.1573	-0.12279 0.6274	-0.21871 0.3990	0.16519 0.5409	0.14124 0.6301
BSIHOS	0.09743 0.7404	0.45951 <u>0.0361</u>	0.35201 0.2884	0.08021 0.7517	-0.18321 0.4815	0.07187 0.7914	0.04508 0.8784
BSIPHOB	0.00251 0.9932	0.62245 <u>0.0026</u>	0.59502 <u>0.0535</u>	-0.23494 0.3480	-0.26649 0.3012	0.28959 0.2766	0.20884 0.4737
BSIPAR	0.11807 0.6877	0.69387 <u>0.0005</u>	0.39297 0.2319	-0.09756 0.7002	-0.09545 0.7156	0.10608 0.6958	0.11798 0.6879
BSIPSY	0.48919 0.0759	0.33024 0.1437	0.10590 0.7566	-0.30178 0.2236	-0.09979 0.7032	0.41475 0.1102	-0.03013 0.9186
BSIGSI	0.10166 0.7295	0.60629 <u>0.0036</u>	0.26569 0.4297	-0.10560 0.6767	-0.44917 0.0705	0.26440 0.3224	0.13039 0.6568

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 BSIPHOB = Phobic Anxiety; BSIPAR = Paranoid Ideation;
 BSIPSY = Psychoticism; BSIGSI = Global Severity Index

Table F3

***Correlation Analysis of REQ* Item Category Absolute Total Score Means to
BSI** Symptom Dimension and GSI Score Means for Male Participants***

	REQWRK	REQFIN	REQLIV	REQFAM	REQREL	REQRUR	REQMISC
BSISOM	0.44360 0.2709	-0.21608 0.5000	-0.22310 0.6709	-0.21866 0.4729	-0.28109 0.5414	-0.33715 0.2385	-0.18947 0.5165
BSIO-C	0.43157 0.2857	-0.10442 0.7467	-0.16048 0.7613	-0.22441 0.4611	-0.22396 0.6293	-0.24045 0.4076	-0.17127 0.5583
BSII-S	0.02357 0.9558	0.13343 0.6793	0.26941 0.6057	-0.00515 0.9867	0.41363 0.3563	-0.00757 0.9795	0.10503 0.7208
BSIDEP	0.30662 0.4601	0.14811 0.6460	0.46807 0.3492	-0.06888 0.8231	0.17538 0.7068	-0.03819 0.8969	0.13724 0.6399
BSIANX	0.72045 <u>0.0438</u>	0.49927 0.0984	0.39713 0.4356	0.10237 0.7393	0.40713 0.3647	0.27926 0.3336	0.40020 0.1562
BSIHOS	-0.27852 0.5042	-0.05032 0.8766	0.51858 0.2919	-0.07200 0.8152	-0.01350 0.9771	-0.08510 0.7724	-0.02564 0.9307
BSIPHOB	0.20473 0.6267	0.15288 0.6352	0.33798 0.5123	0.11013 0.7202	0.22533 0.6271	-0.03934 0.8938	0.17535 0.5488
BSIPAR	0.14795 0.7266	0.18778 0.5589	0.12616 0.8118	0.08869 0.7733	0.46790 0.2897	0.02284 0.9382	0.14483 0.6213
BSIPSY	-0.36275 0.3772	-0.21608 0.5000	-0.57702 0.2305	-0.28790 0.3402	-0.37444 0.4079	-0.33412 0.2430	-0.33966 0.2348
BSIGSI	0.21299 0.6126	0.05464 0.8661	0.16514 0.7545	-0.07305 0.8125	0.11743 0.8020	-0.10320 0.7255	0.02646 0.9284

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 BSIPHOB = Phobic Anxiety; BSIPAR = Paranoid Ideation;
 BSIPSY = Psychoticism; BSIGSI = Global Severity Index

Table F4

Correlation Analysis of REQ* Item Category Total Positive Score Means to BSI** Symptom Dimension and GSI Score Means for All Participants

	REQWRK	REQFIN	REQLIV	REQFAM	REQREL	REQRUR	REQMISC
BSISOM	-0.03582 0.8049	0.11220 0.4379	-0.06785 0.6397	-0.14551 0.3133	-0.15366 0.2867	-0.03998 0.7828	-0.16780 0.2441
BSIO-C	-0.03869 0.7897	0.12618 0.3826	-0.06292 0.6642	0.19113 0.1836	-0.20240 0.1587	-0.00607 0.9666	-0.19732 0.1696
BSII-S	0.05466 0.7061	0.20259 0.1582	-0.05873 0.6854	0.09474 0.5128	-0.03233 0.8236	0.18786 0.1914	-0.00136 0.9925
BSIDEP	0.06974 0.6303	0.31517 <u>0.0258</u>	0.07183 0.6201	0.21182 0.1397	-0.00659 0.9638	0.16621 0.2487	-0.05205 0.7196
BSIANX	0.23029 0.1076	0.40981 <u>0.0031</u>	0.32207 <u>0.0226</u>	0.13079 0.3653	0.15261 0.2900	0.35023 <u>0.0127</u>	0.17011 0.2376
BSIHOS	-0.18414 0.2005	0.28869 <u>0.0420</u>	0.04502 0.7562	0.14193 0.3255	-0.09637 0.5056	0.14868 0.3028	-0.08266 0.5682
BSIPHOB	0.10675 0.4606	0.32917 <u>0.0196</u>	0.13974 0.3331	0.09002 0.5342	0.03169 0.8271	0.23048 0.1073	0.06735 0.6421
BSIPAR	0.06799 0.6390	0.31114 <u>0.0279</u>	0.18238 0.2049	0.01541 0.9154	0.02101 0.8848	0.19682 0.1707	0.00297 0.9836
BSIPSY	0.29194 <u>0.0397</u>	-0.01503 0.9175	-0.05106 0.7247	-0.05462 0.7064	-0.10774 0.4564	-0.04579 0.7522	-0.12810 0.3753
BSIGSI	0.02946 0.8391	0.27604 <u>0.0523</u>	0.04749 0.7433	0.15799 0.2732	-0.12562 0.5586	-0.00629 0.9737	-0.04523 0.8192

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 BSIPHOB = Phobic Anxiety; BSIPAR = Paranoid Ideation;
 BSIPSY = Psychoticism; BSIGSI = Global Severity Index

Table F5

***Correlation Analysis of REQ* Item Category Total Positive Score Means to
BSI** Symptom Dimension and GSI Score Means for Female Participants***

	REQWRK	REQFIN	REQLIV	REQFAM	REQREL	REQRUR	REQMISC
BSISOM	0.18238 0.5326	0.55769 <u>0.0086</u>	0.08759 0.7979	0.28702 0.2482	-0.19961 0.4424	0.38331 0.1428	0.03156 0.9147
BSIO-C	0.21457 0.4613	0.42783 <u>0.0530</u>	0.01765 0.9589	0.25592 0.3054	-0.48118 <u>0.0505</u>	0.35432 0.1781	-0.11016 0.7077
BSII-S	0.22385 0.4417	0.41255 0.0631	-0.05648 0.8690	-0.08413 0.7400	-0.33677 0.1862	0.36943 0.1591	0.18197 0.5335
BSIDEP	0.28994 0.3146	0.47468 <u>0.0297</u>	0.16247 0.6332	0.05725 0.8215	-0.32697 0.2002	0.31093 0.2411	-0.24629 0.3960
BSIANX	0.07084 0.8098	0.40231 0.0706	0.38390 0.2438	-0.19079 0.4482	-0.23212 0.3700	0.23027 0.3909	-0.12915 0.6599
BSIHOS	-0.23378 0.4212	0.48669 <u>0.0253</u>	0.18315 0.5899	0.05658 0.8236	-0.28365 0.2699	0.43716 0.0904	-0.16799 0.5659
BSIPHOB	0.05011 0.8649	0.37005 0.0987	0.32476 0.3298	-0.21086 0.4010	-0.29801 0.2453	0.29086 0.2744	0.02177 0.9411
BSIPAR	0.20012 0.4927	0.36135 0.1075	0.27995 0.4044	-0.30333 0.2211	-0.22640 0.3822	0.24994 0.3505	-0.10698 0.7159
BSIPSY	0.63265 <u>0.0152</u>	0.03048 0.8957	0.22887 0.4985	-0.18585 0.4603	-0.17977 0.4899	-0.06142 0.8212	-0.19438 0.5055
BSIGSI	0.21329 0.4641	0.52130 <u>0.0154</u>	0.18837 0.5791	0.02015 0.9367	-0.39385 0.1178	0.39017 0.1352	-0.12122 0.6798

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BSIPHOB = Phobic Anxiety; BSIPAR = Paranoid Ideation;
BSIPSY = Psychoticism; BSIGSI = Global Severity Index

Table F6

Correlation Analysis of REQ* Item Category Total Positive Score Means to BSI** Symptom Dimension and GSI Score Means for Male Participants

	REQWRK	REQFIN	REQLIV	REQFAM	REQREL	REQRUR	REQMISC
BSISOM	0.27460 0.5104	-0.03136 0.9229	-0.33532 0.5159	-0.25426 0.4019	-0.20650 0.6569	-0.20336 0.4856	-0.27226 0.3464
BSIO-C	0.14544 0.7311	0.03814 0.9063	-0.43389 0.3900	-0.18526 0.5446	-0.14878 0.7502	-0.14837 0.6127	-0.27122 0.3483
BSII-S	-0.28122 0.4999	0.25919 0.4159	-0.28098 0.5896	-0.07543 0.8065	0.19322 0.6781	0.11179 0.7036	0.02988 0.9192
BSIDEP	0.02030 0.9619	0.32090 0.3091	0.24847 0.6350	0.06926 0.8221	0.18301 0.6945	0.12396 0.6729	0.04805 0.8704
BSIANX	0.55850 0.1502	0.66250 <u>0.0189</u>	0.21060 0.6888	0.16191 0.5972	0.43547 0.3288	0.42249 0.1323	0.30294 0.2924
BSIHOS	-0.55607 0.1524	0.03578 0.9121	-0.19089 0.7171	-0.15393 0.6156	-0.16508 0.7236	-0.07009 0.8118	-0.14925 0.6106
BSIPHOB	-0.11360 0.7888	0.30079 0.3421	-0.23264 0.6573	0.02618 0.9323	0.09716 0.8358	0.04714 0.8729	0.04673 0.8740
BSIPAR	-0.15577 0.7126	0.33388 0.2889	-0.36842 0.4724	0.05686 0.8536	0.26947 0.5590	0.14758 0.6146	0.10022 0.7332
BSIPSY	-0.61828 0.1023	-0.26525 0.4047	-0.84959 <u>0.0322</u>	-0.23763 0.4344	-0.38481 0.3940	-0.28728 0.3193	-0.39772 0.1590
BSIGSI	-0.10686 0.8012	0.21154 0.5092	-0.33471 0.5167	-0.08561 0.7809	0.04747 0.9195	0.01990 0.9462	-0.07320 0.8036

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 BSIPSY = Psychoticism; BSIGSI = Global Severity Index

Table F7

***Correlation Analysis of REQ* Item Category Total Negative Score Means to
BSI** Symptom Dimension and GSI Score Means for All Participants***

	REQWRK	REQFIN	REQLIV	REQFAM	REQREL	REQRUR	REQMISC
BSISOM	0.08407 0.5616	0.03030 0.8346	-0.05191 0.7203	0.00795 0.9563	0.08291 0.5671	0.15611 0.2790	-0.00477 0.9738
BSIO-C	0.12531 0.3859	-0.00692 0.9620	-0.06150 0.6714	0.04968 0.7319	0.11183 0.4394	0.08350 0.5643	-0.02878 0.8427
BSII-S	-0.06130 0.6724	0.08279 0.5676	-0.02830 0.8453	-0.05214 0.7192	0.02303 0.8738	-0.03947 0.7855	-0.03816 0.7925
BSIDEP	0.02664 0.8543	-0.10449 0.4702	0.02375 0.8699	-0.03668 0.8003	0.03337 0.8180	0.01746 0.9042	-0.14005 0.3320
BSIANX	-0.08566 0.5542	-0.29779 <u>0.0357</u>	-0.19713 0.1700	-0.14857 0.3031	-0.11473 0.4276	-0.09077 0.5307	-0.25901 0.0693
BSIHOS	-0.24485 0.0866	-0.09343 0.5187	-0.17842 0.2151	-0.14425 0.3176	-0.14845 0.3035	0.00028 0.9985	-0.17801 0.2162
BSIPHOB	-0.23495 0.1005	-0.12521 0.3863	-0.25487 0.0741	-0.13497 0.3500	-0.17408 0.2266	-0.15909 0.2698	-0.22197 0.1213
BSIPAR	-0.12539 0.3856	-0.34137 <u>0.0153</u>	-0.24475 0.0867	-0.21561 0.1326	-0.12335 0.3934	-0.03523 0.8081	-0.13264 0.3585
BSIPSY	0.07807 0.5900	-0.31630 <u>0.0252</u>	0.05717 0.6933	0.02638 0.8557	-0.06872 0.6354	-0.27125 0.0567	-0.17955 0.2121
BSIGSI	-0.04330 0.7653	-0.09519 0.5108	-0.11544 0.4247	-0.08559 0.5545	-0.01193 0.9345	0.00674 0.9630	-0.12047 0.4047

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 BSIPSY = Psychoticism; BSIGSI = Global Severity Index

Table F8

Correlation Analysis of REQ* Item Category Total Negative Score Means to BSI** Symptom Dimension and GSI Score Means for Female Participants

	REQWRK	REQFIN	REQLIV	REQFAM	REQREL	REQRUR	REQMISC
BSISOM	0.09583 0.7445	-0.08858 0.7026	-0.24911 0.4601	0.15394 0.5419	-0.05259 0.8411	0.08113 0.7652	-0.00982 0.9734
BSIO-C	0.24172 0.4051	-0.07335 0.7520	-0.11847 0.7287	0.30017 0.2262	0.06695 0.7985	-0.01379 0.9596	-0.02467 0.9333
BSII-S	0.27417 0.3428	-0.05095 0.8264	0.04348 0.8990	0.20129 0.4232	0.29930 0.2432	-0.10332 0.7034	-0.29193 0.3112
BSIDEP	0.28392 0.3252	-0.24862 0.2771	0.12783 0.7080	0.16547 0.5117	0.15721 0.5468	-0.03128 0.9084	-0.44487 0.1110
BSIANX	0.02007 0.9457	-0.55353 <u>0.0092</u>	-0.15737 0.6440	-0.02311 0.9275	-0.03833 0.8839	0.00000 1.0000	-0.33672 0.2391
BSIHOS	-0.50998 0.0625	-0.12676 0.5840	-0.23791 0.4811	-0.03549 0.8888	-0.16019 0.5391	0.33508 0.2046	-0.27846 0.3350
BSIPHOB	0.07373 0.8022	-0.38856 0.0817	-0.38638 0.2405	0.07039 0.7814	-0.06849 0.7939	-0.11220 0.6791	-0.21093 0.4692
BSIPAR	0.12999 0.6578	-0.47151 <u>0.0309</u>	-0.18713 0.5817	-0.13114 0.6040	-0.19634 0.4501	0.10148 0.7084	-0.28004 0.3322
BSIPSY	0.23455 0.4196	-0.33051 0.1434	0.10901 0.7497	0.15358 0.5429	-0.12354 0.6366	-0.63597 <u>0.0081</u>	-0.22751 0.4341
BSIGSI	0.17535 0.5488	-0.25787 0.2591	-0.12747 0.7088	0.11706 0.6437	0.04027 0.8781	0.02148 0.9371	-0.31354 0.2750

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 BSIPSY = Psychoticism; BSIGSI = Global Severity Index

Table F9

***Correlation Analysis of REQ* Item Category Total Negative Score Means to
BSI** Symptom Dimension and GSI Score Means for Male Participants***

	REQWRK	REQFIN	REQLIV	REQFAM	REQREL	REQRUR	REQMISC
BSISOM	-0.22834 0.5865	0.39430 0.2047	-0.12103 0.8193	0.09963 0.7461	0.03352 0.9431	0.28372 0.3256	-0.32975 0.2496
BSIO-C	-0.54943 0.1584	0.31068 0.3257	-0.31425 0.5441	0.14561 0.6350	0.05509 0.9066	0.19752 0.4985	-0.39346 0.1640
BSII-S	-0.80753 <u>0.0154</u>	0.29704 0.3484	-0.66259 0.1516	-0.03743 0.9034	-0.24871 0.5907	0.17454 0.5506	-0.27680 0.3380
BSIDEP	-0.61361 0.1057	0.40454 0.1921	-0.28262 0.5874	0.11694 0.7036	0.07672 0.8701	0.24459 0.3994	-0.32751 0.2530
BSIANX	-0.06826 0.8724	0.41878 0.1754	-0.24004 0.6469	-0.02208 0.9429	0.19722 0.6717	0.13216 0.6524	-0.33672 0.2391
BSIHOS	-0.88826 <u>0.0032</u>	0.18894 0.5565	-0.86277 <u>0.0270</u>	-0.00741 0.9808	-0.27800 0.5461	0.04451 0.8799	-0.47144 0.0888
BSIPHOB	-0.75161 <u>0.0315</u>	0.34893 0.2663	-0.68992 0.1293	-0.10854 0.7241	-0.15008 0.7481	0.13552 0.6441	-0.47408 0.0868
BSIPAR	-0.74127 <u>0.0353</u>	0.34841 0.2671	-0.58954 0.2181	-0.06692 0.8280	-0.18962 0.6839	0.17416 0.5515	-0.15760 0.5905
BSIPSY	-0.87200 <u>0.0048</u>	-0.13285 0.6806	-0.29217 0.5742	0.18683 0.5411	-0.15310 0.7431	0.15725 0.5913	-0.24806 0.3925
BSIGSI	-0.75147 <u>0.0316</u>	0.35921 0.2515	-0.59773 0.2102	0.03290 0.9150	-0.08392 0.8580	0.20557 0.4808	-0.37624 0.1849

* Rural Experiences Questionnaire (REQ) item category abbreviations:
 REQWRK = Work-Related Events; REQFIN = Financial Events;
 REQLIV = Living Conditions; REQFAM = Family-Related Events;
 REQREL = Relationship Events; REQRUR = Rural Events;
 REQMISC = Miscellaneous Events

** Brief Symptom Inventory (BSI) abbreviations: BSISOM = Somatization;
 BSIO-C = Obsessive-Compulsive; BSII-S = Interpersonal Sensitivity;
 BSIDEP = Depression; BSIANX = Anxiety; BSIHOS = Hostility;
 BSIPHOB = Phobic Anxiety; BSIPAR = Paranoid Ideation;
 BSIPSY = Psychoticism; BSIGSI = Global Severity Index

Table F10

***Correlation Analysis of DUHP* Dimension Score Means
to REQ** Item Category Absolute Total Score Means for All Participants***

	DUHPSYM	DUHPSOC	DUHPPHY	DUHPEMT
REQWRK	0.03376 0.8814	-0.38006 0.0810	-0.14622 0.5162	0.07107 0.7533
REQFIN	0.08340 0.6445	-0.26441 0.1370	0.03007 0.8681	-0.01627 0.9284
REQLIV	0.33127 0.1940	-0.05514 0.8335	0.07267 0.7816	0.00311 0.9905
REQFAM	0.27072 0.1408	-0.35213 <u>0.0520</u>	0.27032 0.1414	0.28425 0.1212
REQREL	0.32442 0.1219	0.04162 0.8469	-0.02124 0.9215	0.32988 0.1154
REQRUR	0.18939 0.3162	-0.01941 0.9189	-0.05052 0.7909	0.15923 0.4006
REQMISC	0.22632 0.2468	-0.01525 0.9386	0.07106 0.7193	0.38431 <u>0.0435</u>

* Duke-UNC Health Profile (DUHP) subscale abbreviations: DUHPSYM = Symptoms;
DUHPSOC = Social; DUHPPHY = Physical; DUHPEMT = Emotional

** Rural Experiences Questionnaire (REQ) item category abbreviations:
REQWRK = Work-Related Events; REQFIN = Financial Events;
REQLIV = Living Conditions; REQFAM = Family-Related Events;
REQREL = Relationship Events; REQRUR = Rural Events;
REQMISC = Miscellaneous Events

Table F11

***Correlation Analysis of DUHP* Dimension Score Means
to REQ** Item Category Absolute Total Score Means for Female Participants***

	DUHPSYM	DUHPSOC	DUHPPHY	DUHPMT
REQWRK	-0.21829 0.4534	-0.00273 0.9926	-0.13599 0.6430	-0.20867 0.4740
REQFIN	-0.12690 0.5836	-0.18729 0.4162	-0.20499 0.3727	-0.45021 <u>0.0406</u>
REQLIV	-0.35486 0.2842	-0.10740 0.7533	0.33686 0.3111	-0.21430 0.5269
REQFAM	-0.00821 0.9742	-0.52431 <u>0.0255</u>	0.11345 0.6540	-0.04547 0.8578
REQREL	0.20668 0.4261	-0.34315 0.1775	0.41327 0.0992	0.55296 <u>0.0213</u>
REQRUR	-0.35628 0.1756	-0.09238 0.7336	0.09461 0.7275	0.03758 0.8901
REQMISC	0.04415 0.8809	-0.18737 0.5212	-0.05622 0.8486	0.07369 0.8023

* Duke-UNC Health Profile (DUHP) subscale abbreviations: DUHPSYM = Symptoms;
DUHPSOC = Social; DUHPPHY = Physical; DUHPMT = Emotional

** Rural Experiences Questionnaire (REQ) item category abbreviations:
REQWRK = Work-Related Events; REQFIN = Financial Events;
REQLIV = Living Conditions; REQFAM = Family-Related Events;
REQREL = Relationship Events; REQRUR = Rural Events;
REQMISC = Miscellaneous Events

Table F12

***Correlation Analysis of DUHP* Dimension Score Means
to REQ** Item Category Absolute Total Score Means for Male Participants***

	DUHPSYM	DUHPSOC	DUHPPHY	DUHPEMT
REQWRK	0.03009 0.9436	-0.33114 0.4230	-0.77084 <u>0.0252</u>	-0.28956 0.4867
REQFIN	0.39836 0.1996	0.06026 0.8524	-0.07577 0.8150	0.30320 0.3381
REQLIV	0.42191 0.4047	-0.15401 0.7708	-0.05534 0.9171	0.54975 0.2584
REQFAM	0.19752 0.5177	-0.39501 0.1816	0.21806 0.4742	0.26305 0.3852
REQREL	0.39418 0.3816	-0.09872 0.8332	0.12880 0.7831	0.23872 0.6062
REQRUR	0.50302 0.0667	0.09172 0.7552	0.22323 0.4430	0.35621 0.2113
REQMISC	0.41963 0.1353	0.07757 0.7921	0.08506 0.7725	0.41765 0.1373

* Duke-UNC Health Profile (DUHP) subscale abbreviations: DUHPSYM = Symptoms;
DUHPSOC = Social; DUHPPHY = Physical; DUHPEMT = Emotional

** Rural Experiences Questionnaire (REQ) item category abbreviations:
REQWRK = Work-Related Events; REQFIN = Financial Events;
REQLIV = Living Conditions; REQFAM = Family-Related Events;
REQREL = Relationship Events; REQRUR = Rural Events;
REQMISC = Miscellaneous Events

Table F13

***Correlation Analysis of DUHP* Dimension Score Means
to REQ** Item Category Total Positive Score Means for All Participants***

	DUHPSYM	DUHPSOC	DUHPPHY	DUHPEMT
REQWRK	0.13437 0.3522	-0.01704 0.9065	-0.16080 0.2646	0.10850 0.4532
REQFIN	0.16451 0.2536	0.08389 0.5625	-0.01507 0.9173	0.02871 0.8431
REQLIV	0.04038 0.7807	-0.15358 0.2869	0.01598 0.9123	0.10660 0.4612
REQFAM	-0.03813 0.7926	-0.14455 0.3166	0.03773 0.7948	0.05287 0.7154
REQREL	0.24250 0.0897	-0.09040 0.5324	-0.00450 0.9753	0.31919 <u>0.0239</u>
REQRUR	0.19908 0.1657	0.07032 0.6275	0.04795 0.7409	0.14181 0.3259
REQMISC	0.20326 0.1569	-0.07822 0.5892	-0.00141 0.9922	0.30442 <u>0.0316</u>

* Duke-UNC Health Profile (DUHP) subscale abbreviations: DUHPSYM = Symptoms;
DUHPSOC = Social; DUHPPHY = Physical; DUHPEMT = Emotional

** Rural Experiences Questionnaire (REQ) item category abbreviations:
REQWRK = Work-Related Events; REQFIN = Financial Events;
REQLIV = Living Conditions; REQFAM = Family-Related Events;
REQREL = Relationship Events; REQRUR = Rural Events;
REQMISC = Miscellaneous Events

Table F14

***Correlation Analysis of DUHP* Dimension Score Means
to REQ** Item Category Total Positive Score Means for Female Participants***

	DUHPSYM	DUHPSOC	DUHPPHY	DUHPEMT
REQWRK	-0.11612 0.6926	0.12067 0.6811	-0.41274 0.1425	0.07308 0.8039
REQFIN	-0.00494 0.9830	0.12494 0.5895	0.03782 0.8707	-0.19421 0.3989
REQLIV	0.04042 0.9061	0.22037 0.5150	0.15431 0.6505	0.05958 0.8619
REQFAM	-0.03212 0.8993	-0.16309 0.5179	0.20704 0.4098	0.15623 0.5359
REQREL	0.45502 0.0665	-0.24989 0.3334	0.21976 0.3967	0.57707 <u>0.0153</u>
REQRUR	-0.13878 0.6082	-0.19079 0.4791	0.24574 0.3589	0.01654 0.9515
REQMISC	-0.18330 0.5305	-0.37297 0.1890	-0.06269 0.8314	0.47784 0.0841

* Duke-UNC Health Profile (DUHP) subscale abbreviations: DUHPSYM = Symptoms;
DUHPSOC = Social; DUHPPHY = Physical; DUHPEMT = Emotional

** Rural Experiences Questionnaire (REQ) item category abbreviations:
REQWRK = Work-Related Events; REQFIN = Financial Events;
REQLIV = Living Conditions; REQFAM = Family-Related Events;
REQREL = Relationship Events; REQRUR = Rural Events;
REQMISC = Miscellaneous Events

Table F15

***Correlation Analysis of DUHP* Dimension Score Means
to REQ** Item Category Total Positive Score Means for Male Participants***

	DUHPSYM	DUHPSOC	DUHPPHY	DUHPEMT
REQWRK	-0.00600 0.9887	-0.29013 0.4858	-0.65007 0.0810	-0.05165 0.9033
REQFIN	0.27136 0.3936	-0.03231 0.9206	-0.24729 0.4384	0.22076 0.4905
REQLIV	0.19040 0.7179	0.00000 1.0000	-0.42746 0.3979	0.85663 <u>0.0294</u>
REQFAM	0.07217 0.8148	-0.09508 0.7573	-0.08901 0.7725	0.36974 0.2137
REQREL	0.27465 0.5511	0.00000 1.0000	-0.19476 0.6756	0.24442 0.5973
REQRUR	0.32306 0.2599	0.02157 0.9417	-0.06396 0.8280	0.36005 0.2060
REQMISC	0.39739 0.1594	0.10753 0.7144	0.13106 0.6552	0.48387 0.0796

* Duke-UNC Health Profile (DUHP) subscale abbreviations: DUHPSYM = Symptoms;
DUHPSOC = Social; DUHPPHY = Physical; DUHPEMT = Emotional

** Rural Experiences Questionnaire (REQ) item category abbreviations:
REQWRK = Work-Related Events; REQFIN = Financial Events;
REQLIV = Living Conditions; REQFAM = Family-Related Events;
REQREL = Relationship Events; REQRUR = Rural Events;
REQMISC = Miscellaneous Events

Table F16

***Correlation Analysis of DUHP* Dimension Score Means
to REQ** Item Category Total Negative Score Means for All Participants***

	DUHPSYM	DUHPSOC	DUHPPHY	DUHPEMT
REQWRK	-0.09747 0.5007	0.05121 0.7240	-0.15910 0.2698	0.20326 0.1569
REQFIN	0.01688 0.9074	0.11727 0.4173	-0.04148 0.7749	0.21392 0.1358
REQLIV	0.13262 0.3586	0.35312 <u>0.0119</u>	-0.18578 0.1965	0.18931 0.1879
REQFAM	-0.00975 0.9465	0.32067 <u>0.0232</u>	-0.06213 0.6682	0.11320 0.4338
REQREL	-0.04792 0.7410	0.09995 0.4898	-0.14912 0.3014	-0.08041 0.5788
REQRUR	-0.15907 0.2699	-0.18691 0.1937	-0.19490 0.1750	-0.00504 0.9723
REQMISC	-0.16038 0.2659	0.05063 0.7270	0.05275 0.7160	0.26946 0.0584

* Duke-UNC Health Profile (DUHP) subscale abbreviations: DUHPSYM = Symptoms;
DUHPSOC = Social; DUHPPHY = Physical; DUHPEMT = Emotional

** Rural Experiences Questionnaire (REQ) item category abbreviations:
REQWRK = Work-Related Events; REQFIN = Financial Events;
REQLIV = Living Conditions; REQFAM = Family-Related Events;
REQREL = Relationship Events; REQRUR = Rural Events;
REQMISC = Miscellaneous Events

Table F17

***Correlation Analysis of DUHP* Dimension Score Means
to REQ** Item Category Total Negative Score Means for Female Participants***

	DUHPSYM	DUHPSOC	DUHPPHY	DUHPMT
REQWRK	0.15248 0.6028	0.19087 0.5133	-0.43172 0.1232	0.43060 0.1243
REQFIN	0.13208 0.5682	0.29409 0.1957	0.24770 0.2790	0.33612 0.1363
REQLIV	0.47371 0.1411	0.35967 0.2773	-0.24945 0.4595	0.32262 0.3332
REQFAM	-0.01594 0.9499	0.38561 0.1140	0.04421 0.8617	0.16007 0.5258
REQREL	0.37458 0.1385	0.10400 0.6912	-0.24182 0.3498	0.08282 0.7520
REQRUR	0.35585 0.1761	-0.06166 0.8206	0.11322 0.6763	-0.03565 0.8957
REQMISC	-0.29803 0.3007	-0.28747 0.3190	-0.01987 0.9462	0.55973 <u>0.0374</u>

* Duke-UNC Health Profile (DUHP) subscale abbreviations: DUHPSYM = Symptoms;
DUHPSOC = Social; DUHPPHY = Physical; DUHPMT = Emotional

** Rural Experiences Questionnaire (REQ) item category abbreviations:
REQWRK = Work-Related Events; REQFIN = Financial Events;
REQLIV = Living Conditions; REQFAM = Family-Related Events;
REQREL = Relationship Events; REQRUR = Rural Events;
REQMISC = Miscellaneous Events

Table F18

***Correlation Analysis of DUHP* Dimension Score Means
to REQ** Item Category Total Negative Score Means for Male Participants***

	DUHPSYM	DUHPSOC	DUHPPHY	DUHPEMT
REQWRK	-0.08172 0.8475	-0.05851 0.8905	-0.06861 0.8726	0.49213 0.2154
REQFIN	-0.24566 0.4415	-0.20250 0.5279	-0.39430 0.2047	-0.15491 0.6307
REQLIV	-0.29434 0.5712	0.18939 0.7193	-0.43596 0.3875	0.33401 0.5176
REQFAM	-0.18023 0.5557	0.38864 0.1894	-0.29561 0.3268	-0.08327 0.7868
REQREL	-0.07389 0.8749	0.14247 0.7606	-0.53685 0.2141	0.09597 0.8378
REQRUR	-0.39490 0.1623	-0.12597 0.6678	-0.47488 0.0862	-0.08992 0.7598
REQMISC	-0.05030 0.8644	0.12009 0.6826	0.18158 0.5344	0.28540 0.3226

* Duke-UNC Health Profile (DUHP) subscale abbreviations: DUHPSYM = Symptoms;
DUHPSOC = Social; DUHPPHY = Physical; DUHPEMT = Emotional

** Rural Experiences Questionnaire (REQ) item category abbreviations:
REQWRK = Work-Related Events; REQFIN = Financial Events;
REQLIV = Living Conditions; REQFAM = Family-Related Events;
REQREL = Relationship Events; REQRUR = Rural Events;
REQMISC = Miscellaneous Events

Appendix G

**Tables Showing the Psychological Symptoms-General Health
Correlations for the Study's Rural Participants**

Table G1

***Correlation Analysis of DUHP* Dimension Score Means
to BSI** Symptom Dimension and GSI Score Means for All Participants***

	DUHPSYM	DUHPSOC	DUHPPHY	DUHPENT
BSISOM	-0.52146 <u>0.0001</u>	-0.05549 0.7019	-0.40704 <u>0.0034</u>	-0.42851 <u>0.0019</u>
BSIO-C	-0.50370 <u>0.0002</u>	0.05655 0.6965	-0.28552 <u>0.0444</u>	-0.53932 <u>0.0001</u>
BSII-S	-0.29261 <u>0.0392</u>	0.12790 0.3761	-0.19234 0.1808	-0.51006 <u>0.0002</u>
BSIDEP	-0.36016 <u>0.0102</u>	0.15817 0.2726	-0.34096 <u>0.0154</u>	-0.54069 <u>0.0001</u>
BSIANX	-0.07534 0.6031	0.03298 0.8202	-0.12598 0.3833	-0.53875 <u>0.0001</u>
BSIHOS	-0.27785 <u>0.0507</u>	0.02051 0.8876	-0.15186 0.2924	-0.35250 <u>0.0120</u>
BSIPHOB	-0.15867 0.2711	0.11244 0.4369	-0.07547 0.6024	-0.46483 <u>0.0007</u>
BSIPAR	-0.15254 0.2903	0.01191 0.9346	-0.15091 0.2955	-0.50295 <u>0.0002</u>
BSIPSY	-0.19044 0.1853	0.17385 0.2273	-0.10812 0.4548	-0.31290 <u>0.0269</u>
BSIGSI	-0.38242 <u>0.0061</u>	0.06678 0.6450	-0.28866 <u>0.0420</u>	-0.59998 <u>0.0001</u>

* Duke-UNC Health Profile (DUHP) subscale abbreviations: DUHPSYM = Symptoms;
DUHPSOC = Social; DUHPPHY = Physical; DUHPENT = Emotional

** Brief Symptom Inventory (BSI) abbreviations: BSISOM = Somatization;
BSIO-C = Obsessive-Compulsive; BSII-S = Interpersonal Sensitivity;
BSIDEP = Depression; BSIANX = Anxiety; BSIHOS = Hostility;
BSIPHOB = Phobic Anxiety; BSIPAR = Paranoid Ideation;
BSIPSY = Psychoticism; BSIGSI = Global Severity Index

Table G2

***Correlation Analysis of DUHP* Dimension Score Means
to BSI** Symptom Dimension and GSI Score Means for Female Participants***

	DUHPSYM	DUHPSOC	DUHPPHY	DUHPEMT
BSISOM	-0.54171 <u>0.0014</u>	-0.00570 0.9753	-0.38912 <u>0.0277</u>	-0.36068 <u>0.0426</u>
BSIO-C	-0.60333 <u>0.0003</u>	0.04467 0.8082	-0.27309 0.1305	-0.46050 <u>0.0080</u>
BSII-S	-0.32134 0.0729	0.20176 0.2681	-0.17116 0.3489	-0.49943 <u>0.0036</u>
BSIDEP	-0.42097 <u>0.0164</u>	0.15517 0.3964	-0.31048 0.0837	-0.57345 <u>0.0006</u>
BSIANX	-0.19665 0.2807	0.00550 0.9762	-0.08041 0.6618	-0.54810 <u>0.0012</u>
BSIHOS	-0.31016 0.0841	-0.02633 0.8862	-0.07440 0.6857	-0.40664 <u>0.0209</u>
BSIPHOB	-0.29516 0.1010	0.07858 0.6690	0.02269 0.9019	-0.50852 <u>0.0030</u>
BSIPAR	-0.21515 0.2370	-0.04732 0.7970	-0.16324 0.3720	-0.48835 <u>0.0046</u>
BSIPSY	-0.19531 0.2841	0.21409 0.2393	-0.10789 0.5567	-0.29802 0.0976
BSIGSI	-0.46148 <u>0.0078</u>	0.06322 0.7310	-0.26432 0.1438	-0.59032 <u>0.0004</u>

* Duke-UNC Health Profile (DUHP) subscale abbreviations: DUHPSYM = Symptoms;
DUHPSOC = Social; DUHPPHY = Physical; DUHPEMT = Emotional

** Brief Symptom Inventory (BSI) abbreviations: BSISOM = Somatization;
BSIO-C = Obsessive-Compulsive; BSII-S = Interpersonal Sensitivity;
BSIDEP = Depression; BSIANX = Anxiety; BSIHOS = Hostility;
BSIPHOB = Phobic Anxiety; BSIPAR = Paranoid Ideation;
BSIPSY = Psychoticism; BSIGSI = Global Severity Index

Table G3

***Correlation Analysis of DUHP* Dimension Score Means
to BSI** Symptom Dimension and GSI Score Means for Male Participants***

	DUHPSYM	DUHPSOC	DUHPPHY	DUHPEMT
BSISOM	-0.47370 <u>0.0471</u>	-0.16717 0.5073	-0.63917 <u>0.0043</u>	-0.55300 <u>0.0173</u>
BSIO-C	-0.28785 0.2467	0.10549 0.6770	-0.43455 0.0715	-0.69870 <u>0.0013</u>
BSII-S	-0.26440 0.2890	-0.01515 0.9524	-0.24703 0.3230	-0.59919 <u>0.0086</u>
BSIDEP	-0.23348 0.3511	0.17640 0.4838	-0.48444 <u>0.0416</u>	-0.43863 0.0686
BSIANX	0.12017 0.6348	0.08291 0.7436	-0.24258 0.3321	-0.58221 <u>0.0112</u>
BSIHOS	-0.28422 0.2530	0.08164 0.7474	-0.29318 0.2377	-0.37093 0.1297
BSIPHOB	-0.01927 0.9395	0.15772 0.5319	-0.25087 0.3153	-0.53429 <u>0.0224</u>
BSIPAR	-0.00130 0.9959	0.16401 0.5155	-0.14634 0.5623	-0.54064 <u>0.0205</u>
BSIPSY	-0.28603 0.2499	0.09268 0.7145	-0.35653 0.1464	-0.54139 <u>0.0203</u>
BSIGSI	-0.23515 0.3476	0.08010 0.7520	-0.39518 0.1046	-0.63592 <u>0.0046</u>

* Duke-UNC Health Profile (DUHP) subscale abbreviations: DUHPSYM = Symptoms;
DUHPSOC = Social; DUHPPHY = Physical; DUHPEMT = Emotional

** Brief Symptom Inventory (BSI) abbreviations: BSISOM = Somatization;
BSIO-C = Obsessive-Compulsive; BSII-S = Interpersonal Sensitivity;
BSIDEP = Depression; BSIANX = Anxiety; BSIHOS = Hostility;
BSIPHOB = Phobic Anxiety; BSIPAR = Paranoid Ideation;
BSIPSY = Psychoticism; BSIGSI = Global Severity Index

Appendix H

**Tables Showing Whether Psychological Distress Predicts Physical Health,
Rural Stress Predicts Psychological Distress, and Rural Stress Predicts
Physical Health for All of the Study's Rural Participants
and for the Female and Male Subsamples**

Table H1

***The Criterion Variable for Physical Health (DUHPSYM*)
as Predicted by the Three Predictor Variables for Psychological Distress
(BSIGSI, BSIO-C, and BSIDEP**) for All Participants***

Source	DF	R-Square	Mean Square	F Value	Pr > F
BSIGSI	1	0.2702	0.0064	0.61	0.4380
BSIO-C	1	0.2702	0.0815	7.81	0.0076
BSIDEP	1	0.2702	0.0009	0.09	0.7662

* DUHPSYM = Symptoms dimension of the Duke-UNC Health Profile (DUHP)

** BSIGSI = Global Severity Index of the Brief Symptom Inventory (BSI)
 BSIO-C = Obsessive-Compulsive symptom dimension of the Brief Symptom Inventory
 BSIDEP = Depression symptom dimension of the Brief Symptom Inventory

Table H2

***The Criterion Variable for Physical Health (DUHPSYM*)
as Predicted by the Three Predictor Variables for Psychological Distress
(BSIGSI, BSIO-C, and BSIDEP**) for Female Participants***

Source	DF	R-Square	Mean Square	F Value	Pr > F
BSIGSI	1	0.3850	0.0011	0.13	0.7198
BSIO-C	1	0.3850	0.0642	7.62	0.0101
BSIDEP	1	0.3850	0.0002	0.02	0.8764

* DUHPSYM = Symptoms dimension of the Duke-UNC Health Profile (DUHP)

** BSIGSI = Global Severity Index of the Brief Symptom Inventory (BSI)

BSIO-C = Obsessive-Compulsive symptom dimension of the Brief Symptom Inventory

BSIDEP = Depression symptom dimension of the Brief Symptom Inventory

Table H3

***The Criterion Variable for Physical Health (DUHPSYM*)
as Predicted by the Three Predictor Variables for Psychological Distress
(BSIGSI, BSIO-C, and BSIDEP**) for Male Participants***

Source	DF	R-Square	Mean Square	F Value	Pr > F
BSIGSI	1	0.0940	0.0028	0.17	0.6882
BSIO-C	1	0.0940	0.0097	0.57	0.4629
BSIDEP	1	0.0940	0.0023	0.13	0.7212

* DUHPSYM = Symptoms dimension of the Duke-UNC Health Profile (DUHP)

** BSIGSI = Global Severity Index of the Brief Symptom Inventory (BSI)

BSIO-C = Obsessive-Compulsive symptom dimension of the Brief Symptom Inventory

BSIDEP = Depression symptom dimension of the Brief Symptom Inventory

Table H4

***The Criterion Variable for Psychological Distress (BSIGSI*)
as Predicted by the Three Predictor Variables for Rural Stress
(REQTOT, REQRUR, and REQFIN**) for All Participants***

Source	DF	R-Square	Mean Square	F Value	Pr > F
REQTOT	1	0.2394	0.5130	1.07	0.3129
REQRUR	1	0.2394	0.0405	0.08	0.7743
REQFIN	1	0.2394	3.2179	6.69	0.0168

* BSIGSI = Global Severity Index of the Brief Symptom Inventory (BSI)

** REQTOT = Absolute total score for the Rural Experiences Questionnaire (REQ)

REQRUR = Rural Events category (Items 49 through 59) of the Rural Experiences Questionnaire

REQFIN = Financial Events category (Items 12 through 25) of the Rural Experiences Questionnaire

Note: Number of observations in data set = 26 (see Discussion for explanation)

Table H5

***The Criterion Variable for Psychological Distress (BSIGSI*)
as Predicted by the Three Predictor Variables for Rural Stress
(REQTOT, REQRUR, and REQFIN**) for Female Participants***

Source	DF	R-Square	Mean Square	F Value	Pr > F
REQTOT	1	0.4905	1.0471	2.39	0.1531
REQRUR	1	0.4905	0.7109	1.62	0.2315
REQFIN	1	0.4905	3.3870	7.73	0.0194

* BSIGSI = Global Severity Index of the Brief Symptom Inventory (BSI)

** REQTOT = Absolute total score for the Rural Experiences Questionnaire (REQ)

REQRUR = Rural Events category (Items 49 through 59) of the Rural Experiences Questionnaire

REQFIN = Financial Events category (Items 12 through 25) of the Rural Experiences Questionnaire

Note: Number of observations in data set = 14 (see Discussion for explanation)

Table H6

***The Criterion Variable for Psychological Distress (BSIGSI*)
as Predicted by the Three Predictor Variables for Rural Stress
(REQTOT, REQUR, and REQFIN**) for Male Participants***

Source	DF	R-Square	Mean Square	F Value	Pr > F
REQTOT	1	0.1007	0.0014	0.00	0.9616
REQUR	1	0.1007	0.4311	0.75	0.4124
REQFIN	1	0.1007	0.3112	0.54	0.4835

* BSIGSI = Global Severity Index of the Brief Symptom Inventory (BSI)

** REQTOT = Absolute total score for the Rural Experiences Questionnaire (REQ)

REQUR = Rural Events category (Items 49 through 59) of the Rural Experiences Questionnaire

REQFIN = Financial Events category (Items 12 through 25) of the Rural Experiences Questionnaire

Note: Number of observations in data set = 12 (see Discussion for explanation)

Table H7

***The Criterion Variable for Physical Health (DUHPSYM*)
as Predicted by the Three Predictor Variables for Rural Stress
(REQTOT, REQRUR, and REQFIN**) for All Participants***

Source	DF	R-Square	Mean Square	F Value	Pr > F
REQTOT	1	0.1631	0.0000	0.00	0.9996
REQRUR	1	0.1631	0.0202	1.77	0.1965
REQFIN	1	0.1631	0.0006	0.05	0.8212

* DUHPSYM = Symptoms dimensions of the Duke-UNC Health Profile (DUHP)

** REQTOT = Absolute total score for the Rural Experiences Questionnaire (REQ)

REQRUR = Rural Events category (Items 49 through 59) of the Rural Experiences Questionnaire

REQFIN = Financial Events category (Items 12 through 25) of the Rural Experiences Questionnaire

Note: Number of observations in data set = 26 (see Discussion for explanation)

Table H8

***The Criterion Variable for Physical Health (DUHPSYM*)
as Predicted by the Three Predictor Variables for Rural Stress
(REQTOT, REQRUR, and REQFIN**) for Female Participants***

Source	DF	R-Square	Mean Square	F Value	Pr > F
REQTOT	1	0.1892	0.0066	0.67	0.4314
REQRUR	1	0.1892	0.0053	0.53	0.4815
REQFIN	1	0.1892	0.0050	0.51	0.4924

* DUHPSYM = Symptoms dimensions of the Duke-UNC Health Profile (DUHP)

** REQTOT = Absolute total score for the Rural Experiences Questionnaire (REQ)

REQRUR = Rural Events category (Items 49 through 59) of the Rural Experiences Questionnaire

REQFIN = Financial Events category (Items 12 through 25) of the Rural Experiences Questionnaire

Note: Number of observations in data set = 14 (see Discussion for explanation)

Table H9

***The Criterion Variable for Physical Health (DUHPSYM*)
as Predicted by the Three Predictor Variables for Rural Stress
(REQTOT, REQUR, and REQFIN**) for Male Participants***

Source	DF	R-Square	Mean Square	F Value	Pr > F
REQTOT	1	0.4552	0.0004	0.04	0.8464
REQUR	1	0.4552	0.0395	4.12	0.0769
REQFIN	1	0.4552	0.0041	0.43	0.5308

* DUHPSYM = Symptoms dimensions of the Duke-UNC Health Profile (DUHP)

** REQTOT = Absolute total score for the Rural Experiences Questionnaire (REQ)

REQUR = Rural Events category (Items 49 through 59) of the Rural Experiences Questionnaire

REQFIN = Financial Events category (Items 12 through 25) of the Rural Experiences Questionnaire

Note: Number of observations in data set = 12 (see Discussion for explanation)

Appendix I

**Institutional Review Board Letters Granting Permission to Undertake,
Revise, and Extend This Study**



The University of Oklahoma

OFFICE OF RESEARCH ADMINISTRATION

November 5, 1993

Mr. Philip W. Brown
Department of Educational Psychology
University of Oklahoma

Dear Mr. Brown:

Your research proposal, "Stress as it Relates to Psychological and Physical Health of Rural Inhabitants in a Primary Care Setting," has been reviewed by Dr. Eddie Carol Smith, Chair of the Institutional Review Board, and found to be exempt from the University of Oklahoma-Norman Campus Policies and Procedures for the Protection of Human Subjects in Research Activities.

It is suggested, however, that the informed consent form, "Conditions of Participation" section, be rewritten in the first person tense to be consistent with the rest of the informed consent form.

The exempt status of your protocol is for a period of 12 months from this date, provided that the research procedures are not changed significantly from those described in your "Summary of Research Involving Human Subjects" and attachments. Should you wish to deviate from the described protocol, you must notify me and obtain prior approval from the Board for the changes. If the research is to extend beyond 12 months, you must contact this office, in writing, noting any changes or revisions in the protocol and/or informed consent form, and request an extension.

If you have any questions, please contact me.

Sincerely yours,

A handwritten signature in cursive script that reads "Karen M. Petry".

Karen M. Petry
Administrative Officer
Institutional Review Board

KP/dkj

cc: Dr. Eddie Carol Smith, Chair, IRB
Dr. Terry Pace, Educational Psychology



The University of Oklahoma

OFFICE OF RESEARCH ADMINISTRATION

December 22, 1994

Mr. Philip W. Brown
#7 Somerton Court, Apt. 5
Little Rock, Arkansas 72209

SUBJECT: "Stress as it Relates to Psychological and Physical Health of Rural Inhabitants in a Primary Care Setting"

Dear Mr. Brown:

The Institutional Review Board has reviewed and approved your requested revision and extension to the subject protocol. The project has been extended through November 4, 1995.

Please note that this approval is for the protocol and informed consent form reviewed and approved by the Board on November 5, 1993, and the revision noted in your letter of December 12, 1994. If you wish to make additional changes, you will need to submit a request for change to this office for review.

If you have any questions, please contact me at 325-4757.

Sincerely yours,

A handwritten signature in cursive script that reads "Karen M. Petry".

Karen M. Petry
Administrative Officer
Institutional Review Board-Norman Campus

KMP:sg
94-041

cc: Dr. Eddie Carol Smith, Chair, IRB
Dr. Terry M. Pace, Educational Psychology



The University of Oklahoma

OFFICE OF RESEARCH ADMINISTRATION

July 17, 1995

Mr. Philip W. Brown
#7 Somerton Ct., Apt. 5
Little Rock, AR 72209-4458

SUBJECT: "Stress as it Relates to Psychological and Physical Health of Rural Inhabitants in a Primary Care Setting"

Dear Mr. Brown:

The Institutional Review Board has reviewed and approved the requested revision to the subject protocol.

Please note that this approval is for the protocol and informed consent form initially reviewed by the Board on November 5, 1993, and the revision included in your request dated June 27, 1995. If you wish to make any changes, you will need to submit a request for change to this office for review. Your project still has an ending date of November 4, 1995.

I am sorry this took longer than expected to get to you, but we just today received the letter and LES form. If you have any questions, please contact me at 325-4757.

Sincerely yours,

A handwritten signature in cursive script, reading "Karen M. Petry".

Karen M. Petry
Administrative Officer
Institutional Review Board-Norman Campus

KMP:sg
94-041

cc: Dr. Laurette Taylor, Chair, IRB
Dr. Terry M. Pace, Educational Psychology



The University of Oklahoma

OFFICE OF RESEARCH ADMINISTRATION

October 17, 1995

Mr. Philip W. Brown
301 N. Lincoln Avenue
Kingman, Kansas 67068

SUBJECT: "Effects of Stress on the Psychological Symptoms and General Health of Rural Primary Care Patients"

Dear Mr. Brown:

The Institutional Review Board has reviewed and approved your requested revision and extension to the subject protocol. The project has been extended through November 4, 1996.

Please note that this approval is for the protocol and informed consent form reviewed and approved by the Board on November 5, 1993, and the revisions noted in your letters of December 12, 1994, June 27, 1995, and October 10, 1995. If you wish to make additional changes, you will need to submit a request for change to this office for review.

If you have any questions, please contact me at 325-4757.

Sincerely yours,

A handwritten signature in cursive script, appearing to read "Karen M. Petry".

Karen M. Petry
Administrative Officer
Institutional Review Board-Norman Campus

KMP:sg
94-041

cc: Dr. E. Laurette Taylor, Chair, IRB
Dr. Terry M. Pace, Educational Psychology

Appendix J

**Copies of the Instruments Used in This Study to Assess Demographics,
Rural Stress, Psychological Symptoms, and Physical Health Symptoms**

RURAL EXPERIENCES QUESTIONNAIRE

Listed below are a number of events which sometimes bring about change in the lives of those who experience them and which require social changes. PLEASE READ EACH ITEM AND INDICATE WHETHER THAT EVENT HAS OCCURRED IN YOUR LIFE IN THE PAST 12 MONTHS BY CIRCLING THE NUMBER WHICH IS CLOSEST TO HOW NEGATIVELY OR POSITIVELY THAT EVENT AFFECTED YOU. A rating of -3 would indicate an extremely negative effect on you. A rating of 0 would indicate that you experienced the event but that its effect on you was neutral. A rating of +3 would indicate an extremely positive effect on you. Circle the "X" if the event did not happen to you in the past 12 months.

	Negative Effect			Neutral Effect	Positive Effect			Did Not Happen
1. Change in working hours	-3	-2	-1	0	+1	+2	+3	X
2. Change in work responsibility	-3	-2	-1	0	+1	+2	+3	X
3. Change in working conditions	-3	-2	-1	0	+1	+2	+3	X
4. New job	-3	-2	-1	0	+1	+2	+3	X
5. Trouble with employer	-3	-2	-1	0	+1	+2	+3	X
6. <i>Married Male</i> : Change in wife's work outside the home (got a job, changed jobs, retired)	-3	-2	-1	0	+1	+2	+3	X
7. <i>Married Female</i> : Change in husband's work outside the home (got a job, changed jobs, retired)	-3	-2	-1	0	+1	+2	+3	X
8. Fired from a job	-3	-2	-1	0	+1	+2	+3	X
9. Retirement from work	-3	-2	-1	0	+1	+2	+3	X
10. Cut in pay	-3	-2	-1	0	+1	+2	+3	X
11. Looked for work	-3	-2	-1	0	+1	+2	+3	X
12. Foreclosure on mortgage or loan	-3	-2	-1	0	+1	+2	+3	X
13. Denied credit	-3	-2	-1	0	+1	+2	+3	X
14. Utilities turned off	-3	-2	-1	0	+1	+2	+3	X
15. Borrowed more than \$100,000 (for land, business, equipment, etc.)	-3	-2	-1	0	+1	+2	+3	X

Rural Stress

Page 2
REQ

	Negative Effect			Neutral Effect	Positive Effect			Did Not Happen
16. Borrowed \$50,000-\$100,000 (for land, business, equipment, etc.)	-3	-2	-1	0	+1	+2	+3	X
17. Borrowed less than \$50,000 (for land, business, equipment, etc.)	-3	-2	-1	0	+1	+2	+3	X
18. No guaranteed, steady income	-3	-2	-1	0	+1	+2	+3	X
19. Rent increased	-3	-2	-1	0	+1	+2	+3	X
20. Went on public assistance	-3	-2	-1	0	+1	+2	+3	X
21. Got off public assistance	-3	-2	-1	0	+1	+2	+3	X
22. Changes in government programs	-3	-2	-1	0	+1	+2	+3	X
23. Loss of income	-3	-2	-1	0	+1	+2	+3	X
24. Major unplanned expense	-3	-2	-1	0	+1	+2	+3	X
25. Improved income	-3	-2	-1	0	+1	+2	+3	X
26. Retirement decisions	-3	-2	-1	0	+1	+2	+3	X
27. Moved to new town	-3	-2	-1	0	+1	+2	+3	X
28. Moved to new house/apt.	-3	-2	-1	0	+1	+2	+3	X
29. Major change in living conditions (remodeling, adding to house, deterioration of house or neighborhood)	-3	-2	-1	0	+1	+2	+3	X
30. Left home and lived elsewhere for the first time	-3	-2	-1	0	+1	+2	+3	X
31. Urban encroachment (towns or cities growing and getting closer to my land)	-3	-2	-1	0	+1	+2	+3	X
32. Evicted from a rental	-3	-2	-1	0	+1	+2	+3	X
33. Changed roommates	-3	-2	-1	0	+1	+2	+3	X
34. Got married	-3	-2	-1	0	+1	+2	+3	X
35. Spouse died	-3	-2	-1	0	+1	+2	+3	X

Rural Stress

Page 3
REQ

	Negative Effect			Neutral Effect	Positive Effect			Did Not Happen
36. Close family member died Please specify who _____	-3	-2	-1	0	+1	+2	+3	X
37. Serious illness, injury, or hospitalization of close family member. Please specify who _____	-3	-2	-1	0	+1	+2	+3	X
38. Your child died	-3	-2	-1	0	+1	+2	+3	X
39. Serious illness, injury, or hospitalization of your child	-3	-2	-1	0	+1	+2	+3	X
40. Trouble with in-laws	-3	-2	-1	0	+1	+2	+3	X
41. Separated from spouse due to conflict	-3	-2	-1	0	+1	+2	+3	X
42. New family member arrived (i.e., birth, adoption, foster care, someone moving in)	-3	-2	-1	0	+1	+2	+3	X
43. Marital reconciliation	-3	-2	-1	0	+1	+2	+3	X
44. Separated from spouse due to work or travel	-3	-2	-1	0	+1	+2	+3	X
45. Got divorced	-3	-2	-1	0	+1	+2	+3	X
46. Family member left home (e.g., son or daughter)	-3	-2	-1	0	+1	+2	+3	X
47. Domestic violence	-3	-2	-1	0	+1	+2	+3	X
48. Close family member divorced	-3	-2	-1	0	+1	+2	+3	X
49. Close friend died	-3	-2	-1	0	+1	+2	+3	X
50. Male: wife or girlfriend became pregnant	-3	-2	-1	0	+1	+2	+3	X
51. Female: became pregnant	-3	-2	-1	0	+1	+2	+3	X
52. Male: wife or girlfriend had an abortion	-3	-2	-1	0	+1	+2	+3	X
53. Female: had an abortion	-3	-2	-1	0	+1	+2	+3	X

Rural Stress

Page 4
REQ

	Negative Effect			Neutral Effect	Positive Effect			Did Not Happen
54. Serious illness or injury of a close friend	-3	-2	-1	0	+1	+2	+3	X
55. Engaged to be married	-3	-2	-1	0	+1	+2	+3	X
56. Broke up with boyfriend or girlfriend	-3	-2	-1	0	+1	+2	+3	X
57. Reconciled with boyfriend or girlfriend	-3	-2	-1	0	+1	+2	+3	X
58. Physically or sexually abused by an acquaintance	-3	-2	-1	0	+1	+2	+3	X
59. Lost a pet	-3	-2	-1	0	+1	+2	+3	X
60. Isolated from other people due to bad weather	-3	-2	-1	0	+1	+2	+3	X
61. Isolated from other people due to distance from home to town	-3	-2	-1	0	+1	+2	+3	X
62. Crops affected by the weather	-3	-2	-1	0	+1	+2	+3	X
63. Livestock affected by the weather	-3	-2	-1	0	+1	+2	+3	X
64. Crop market affected by the weather	-3	-2	-1	0	+1	+2	+3	X
65. Livestock market affected by the weather	-3	-2	-1	0	+1	+2	+3	X
66. Harvest, field work, and/or planting affected by the weather	-3	-2	-1	0	+1	+2	+3	X
67. Took part in harvest	-3	-2	-1	0	+1	+2	+3	X
68. Varied or inconsistent work schedule	-3	-2	-1	0	+1	+2	+3	X

Rural Stress

Page 5
REQ

	Negative Effect			Neutral Effect	Positive Effect			Did Not Happen
69. Lacked certain services/resources in community. Please list services unavailable _____	-3	-2	-1	0	+1	+2	+3	X
70. Affected by hunting season	-3	-2	-1	0	+1	+2	+3	X
71. Worked on a ranch or farm	-3	-2	-1	0	+1	+2	+3	X
72. Lived on a ranch or farm	-3	-2	-1	0	+1	+2	+3	X
73. Serious illness, injury, or hospitalization of self	-3	-2	-1	0	+1	+2	+3	X
74. Arrested and put in jail	-3	-2	-1	0	+1	+2	+3	X
75. Outstanding personal achievement. Please specify _____	-3	-2	-1	0	+1	+2	+3	X
76. Minor law violation (i.e., traffic tickets)	-3	-2	-1	0	+1	+2	+3	X
77. Left a church	-3	-2	-1	0	+1	+2	+3	X
78. Finished school or training program	-3	-2	-1	0	+1	+2	+3	X
79. Was the victim of a crime	-3	-2	-1	0	+1	+2	+3	X
80. Other (please specify) _____	-3	-2	-1	0	+1	+2	+3	X
_____	-3	-2	-1	0	+1	+2	+3	X
_____	-3	-2	-1	0	+1	+2	+3	X
_____	-3	-2	-1	0	+1	+2	+3	X

Brief Symptom Inventory

Below is a list of problems people sometimes have. Please read each one carefully, and circle the number that best describes **HOW MUCH THAT PROBLEM HAS DISTRESSED OR BOTHERED YOU DURING THE PAST 7 DAYS INCLUDING TODAY**. Blacken only one number for each problem, and do not skip any items. If you change your mind, erase your first mark carefully.

NOT = not at all
LB = a little bit
MOD = moderately
QB = quite a bit
EXT = extremely

	NOT	LB	MOD	QB	EXT	HOW MUCH WERE YOU DISTRESSED BY:
1.	0	1	2	3	4	Nervousness or shakiness inside
2.	0	1	2	3	4	Faintness or dizziness
3.	0	1	2	3	4	The idea that someone else can control your thoughts
4.	0	1	2	3	4	Feeling others are to blame for most of your troubles
5.	0	1	2	3	4	Trouble remembering things
6.	0	1	2	3	4	Feeling easily annoyed or irritated
7.	0	1	2	3	4	Pains in heart or chest
8.	0	1	2	3	4	Feeling afraid in open spaces or on the streets
9.	0	1	2	3	4	Thoughts of ending your life
10.	0	1	2	3	4	Feeling that most people cannot be trusted
11.	0	1	2	3	4	Poor appetite
12.	0	1	2	3	4	Suddenly scared for no reason
13.	0	1	2	3	4	Temper outbursts that you could not control
14.	0	1	2	3	4	Feeling lonely even when you are with people
15.	0	1	2	3	4	Feeling blocked in getting things done
16.	0	1	2	3	4	Feeling lonely
17.	0	1	2	3	4	Feeling blue
18.	0	1	2	3	4	Feeling no interest in things
19.	0	1	2	3	4	Feeling fearful
20.	0	1	2	3	4	Your feelings being easily hurt
21.	0	1	2	3	4	Feeling that people are unfriendly or dislike you
22.	0	1	2	3	4	Feeling inferior to others
23.	0	1	2	3	4	Nausea or upset stomach
24.	0	1	2	3	4	Feeling that you are watched or talked about by others

	NOT	LB	MOD	QB	EXT	HOW MUCH WERE YOU DISTRESSED BY:
25.	0	1	2	3	4	Trouble falling asleep
26.	0	1	2	3	4	Having to check and double-check what you do
27.	0	1	2	3	4	Difficulty making decisions
28.	0	1	2	3	4	Feeling afraid to travel on buses, subways, or trains
29.	0	1	2	3	4	Trouble getting your breath
30.	0	1	2	3	4	Hot or cold spells
31.	0	1	2	3	4	Having to avoid certain things, places, or activities because they frighten you
32.	0	1	2	3	4	Your mind going blank
33.	0	1	2	3	4	Numbness or tingling in parts of your body
34.	0	1	2	3	4	The idea that you should be punished for your sins
35.	0	1	2	3	4	Feeling hopeless about the future
36.	0	1	2	3	4	Trouble concentrating
37.	0	1	2	3	4	Feeling weak in parts of your body
38.	0	1	2	3	4	Feeling tense or keyed up
39.	0	1	2	3	4	Thoughts of death or dying
40.	0	1	2	3	4	Having urges to beat, injure, or harm someone
41.	0	1	2	3	4	Having urges to break or smash things
42.	0	1	2	3	4	Feeling very self-conscious with others
43.	0	1	2	3	4	Feeling uneasy in crowds, such as shopping or at a movie
44.	0	1	2	3	4	Never feeling close to another person
45.	0	1	2	3	4	Spells of terror or panic
46.	0	1	2	3	4	Getting into frequent arguments
47.	0	1	2	3	4	Feeling nervous when you are left alone
48.	0	1	2	3	4	Others not giving you proper credit for your achievements
49.	0	1	2	3	4	Feeling so restless you couldn't sit still
50.	0	1	2	3	4	Feelings of worthlessness
51.	0	1	2	3	4	Feeling that people will take advantage of you if you let them
52.	0	1	2	3	4	Feelings of guilt
53.	0	1	2	3	4	The idea that something is wrong with your mind

Rural Stress

Date: _____

ID Number: _____

Method of Administration:

- ☐ Self-administered
☐ Interviewer-administered (_____)

Duke-UNC Health Profile

Copyright 1979 by Duke-UNC Health Profile Project:

Department of Community and Family Medicine, Duke University Medical Center, Durham, N. C.
Department of Epidemiology, University of North Carolina, School of Public Health, Chapel Hill, N.C.

Duke-UNC Health Profile

Instructions:

Here are a number of questions about your health and feelings. Please read each question carefully and check (✓) your best answer. You should answer the questions in your own way. There are no right or wrong answers.

DURING THE PAST WEEK: How much trouble have you had with:

	None	Some	A Lot		None	Some	A Lot
1) Eyesight	___	___	___	13) Hurting or aching in any part of your body	___	___	___
2) Hearing	___	___	___	14) Itching in any part of your body	___	___	___
3) Talking	___	___	___	15) Indigestion	___	___	___
4) Tasting food	___	___	___	16) Fever	___	___	___
5) Appetite	___	___	___	17) Getting tired easily	___	___	___
6) Chewing food	___	___	___	18) Fainting	___	___	___
7) Swallowing	___	___	___	19) Poor memory	___	___	___
8) Breathing	___	___	___	20) Weakness in any part of your body	___	___	___
9) Sleeping	___	___	___	21) Feeling depressed or sad	___	___	___
10) Moving your bowels	___	___	___	22) Nervousness	___	___	___
11) Passing water/urinating	___	___	___				
12) Headache	___	___	___				

DURING THE PAST MONTH how much trouble have you had with:

	None	Some	A Lot		None	Some	A Lot
23) Undesired weight loss ..	___	___	___	25) Unusual bleeding	___	___	___
24) Undesired weight gain ..	___	___	___	26) Sexual performance (Having sex)	___	___	___

Rural Stress

DURING THE PAST WEEK how often did you:

	Not at All	1-4 Days	5-7 Days
27) Do your usual work (either inside or outside the home)	_____	_____	_____
28) Get your work done as carefully and accurately as usual	_____	_____	_____
29) Socialize with other people (talk or visit with friends or relatives	_____	_____	_____
30) Take part in social, religious or recreation activities (meetings, church, movies, sports, parties)	_____	_____	_____
31) Care for yourself (bathe, dress, feed yourself)	_____	_____	_____

DURING THE PAST WEEK:

	None	1-4 Days	5-7 Days
32) How many days did you stay <u>in your home</u> because of sickness, injury or health problems?	_____	_____	_____
33) How many days were you <u>in bed</u> most of the day because of sickness, injury or health problems?	_____	_____	_____

TODAY would you have any physical trouble or difficulty:

	None	Some	A Lot
34) Peeling an apple	_____	_____	_____
35) Combing your hair	_____	_____	_____
36) Walking to the bathroom	_____	_____	_____
37) Walking up a flight of stairs	_____	_____	_____
38) Running the length of a football field	_____	_____	_____
39) Running a mile	_____	_____	_____
40) Running 5 miles	_____	_____	_____

Rural Stress

Instructions:

Here are some statements you could use to describe how you feel about yourself. Please read each statement carefully and place a check (✓) in the blank that best fits how the statement describes you.

Here is an example:	Yes, describes me exactly	Somewhat describes me	No, doesn't describe me at all
I like T.V. soap operas	☐	☒	☐

(If you put a check where we have, it means that liking T.V. soap operas describes you more than "somewhat" but not "exactly".)

Answer each item as best you can. There are NO right or wrong answers.

	Yes, describes me exactly	Somewhat describes me	No, doesn't describe me at all
41) I am a pleasant person	☐	☐	☐
42) I don't feel useful	☐	☐	☐
43) I get on well with people of the opposite sex	☐	☐	☐
44) My family doesn't understand me	☐	☐	☐
45) I like who I am	☐	☐	☐
46) I feel hopeful about the future	☐	☐	☐
47) I try to look my best	☐	☐	☐
48) I am a clumsy person	☐	☐	☐
49) I have difficulty making decisions	☐	☐	☐
50) I like meeting new people	☐	☐	☐
51) I'm not an easy person to get along with	☐	☐	☐
52) I'm a failure at everything I try to do	☐	☐	☐
53) I'm basically a healthy person	☐	☐	☐
54) I wish I had more sex appeal	☐	☐	☐
55) I give up too easily	☐	☐	☐
56) I like the way I look	☐	☐	☐
57) I'm not as smart as most people	☐	☐	☐
58) I have difficulty concentrating	☐	☐	☐
59) I'm satisfied with my sexual relationships	☐	☐	☐
60) I am happy with my family relationships	☐	☐	☐
61) I don't treat other people well	☐	☐	☐
62) I am comfortable being around people	☐	☐	☐
63) I can take care of myself in most situations	☐	☐	☐

Personal Information Questionnaire

Please Read: Please either fill in the blank or make a check in the blank next to the choice that applies to you. We ask that you answer all questions honestly and to the best of your ability. It is your choice of whether you answer those questions listed as optional. All information on this form will be kept confidential as the section containing your name, address, and telephone number (if you choose to provide such information) will be detached and stored in a locked file. **Your forms will be identified only by the ID# in the upper right-hand corners of both sections of this form and in the upper-right hand corner of all the other forms along with this form.** Please make sure that all of the forms you have received are marked with the same ID#. If necessary, those supplying their names, addresses, and/or telephone numbers will be contacted (if the permission question is checked "yes") for additional information. When the needed information has been compiled, all identifying information will be destroyed. **You must be 18 years of age or older to complete this form.**

(Name, Address, and Telephone Number are all optional)

Name: _____

Address: _____

Telephone Number: _____ I would like a copy of this report: ☐yes ☐no

I give my permission to be contacted for additional information: ☐yes ☐no

I give my permission for the results from all of these tests to be shared with my doctor: ☐yes ☐no

My Age: _____ Date of birth: _____ My Gender: ☐Male ☐Female

My current marital status: (please mark all that apply now)

☐Married with children ☐Married without children ☐Never married ☐Remarried

☐Separated ☐Widowed ☐Single Parent

☐Divorced: ☐with full custody ☐with joint custody ☐no custody

Number of children living with me: (if there are any, please write in the number below) ☐none

☐by birth--their ages are _____ ☐step-child(ren)--their ages are _____

☐adopted--their ages are _____ ☐foster--their ages are _____

Personal Information Questionnaire

page 2

What is your occupation? (For instance, if you farm, write "farmer." If you are a homemaker, write "homemaker," etc.) _____

If you are a farmer or rancher, you: ☐ own, ☐ rent, or ☐ lease your farm or ranch.

If none of the above, please explain: _____

If you live on a farm or ranch, about how big is it? _____ acres

If you live on a small rural acreage or on a farm or ranch, the distance to the nearest town is _____ miles and the population of that town is about _____.

I live: ☐ alone, ☐ with spouse only ☐ with spouse and child(ren) only ☐ with child(ren) only
☐ with spouse and relative(s) only ☐ with spouse, child(ren), and relative(s) only,
☐ with child(ren) and relative(s) only ☐ with relative(s) only ☐ with spouse and friend(s) only
☐ with spouse, child(ren), and friend(s) only ☐ with child(ren) and friend(s) only
☐ with friend(s) only ☐ other, please explain _____

Number of people living with me: _____ members

I am (check all that apply): ☐ Retired ☐ Employed ☐ Unemployed ☐ Seeking employment
☐ Not seeking employment

Race: ☐ White ☐ American Indian ☐ Black ☐ Mexican American ☐ Asian ☐ Other

If you checked "other," please explain: _____

Years of education I completed: _____ (If you completed high school, that is 12. If you completed four years of college, that's 16.)

If you did not finish high school, did you get your GED? ☐ yes ☐ no

Personal Information Questionnaire

What educational degrees beyond high school do you have, and what are they in? _____

I live in a town or city. ☐yes ☐no If yes, the population is about _____

How far is it to the nearest: doctor _____ miles and hospital _____ miles

Do you smoke cigarettes? ☐yes ☐no

If yes, how many packs each day? ☐less than 1 ☐1 ☐2 ☐more than 2 packs

Do you use smokeless tobacco? ☐yes ☐no

If yes, how much each day? _____ (please write in the amount)

Do you use alcohol? ☐yes ☐no

If yes, how much each week? _____ (please write in the amount)

My income during 1994 was: ☐\$0 - \$5,000 ☐\$5,001 - \$10,000
☐\$10,001 - \$25,000 ☐\$25,001 - \$50,000
☐\$50,001 - \$75,000 ☐\$75,001 - \$100,000
☐\$100,001 or more

The combined income of all the people living in my home during 1994 was:
☐\$0 - \$5,000 ☐\$5,001 - \$10,000
☐\$10,001 - \$25,000 ☐\$25,001 - \$50,000
☐\$50,001 - \$75,000 ☐\$75,001 - \$100,000
☐\$100,001 or more

Please estimate your average annual income during the past 5 years: _____dollars

Please estimate the average annual combined income for all the people living in your home during the past 5 years: _____dollars



Rural Stress

DUKE UNIVERSITY MEDICAL CENTER

Family Medicine Programs

March 28, 1995

**Phil Brown, Ph.D. (Cand)
7 Sommerton Court, Apt. 5
Little Rock, AR 72209**

Dear Mr. Brown:

Thank you for your interest in the Duke-UNC Health Profile. You have our permission to use this instrument in your research. Also, if you decide to use the Duke Health Profile and the Duke Social Support and Stress Scale, you have our permission to use those instruments also.

Please let me know if I can be of further assistance.

Sincerely,

George R. Parkerson, Jr., M.D., M.P.H.

**Department of Community and Family Medicine • Box 3886
Durham, North Carolina 27710 • Telephone (919) 684-3620/684-6721
PICKENS FAX (919) 684-6975 • TRENT FAX (919) 681-6560**

Appendix K

Prospectus

Approval of Prospectus
By the Graduate Committee

Rural Stress

The following prospectus is considered satisfactory by the undersigned graduate committee. The student listed is approved to proceed with the dissertation research.

Title: Effects of Stress on the Psychological Symptoms and General Health of Rural Primary Care Patients

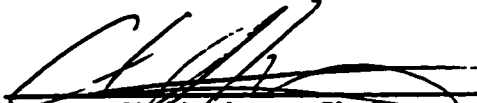
Student: Philip W. Brown

Date: September 28, 1995

Program: Counseling Psychology
College of Education, Dept. of Educational Psychology
University of Oklahoma

Committee Members:


Terry M. Pace, Ph.D., Chair


Cal D. Steltenberg, Ph.D.


Sandra K. Choney, Ph.D.


Jody L. Newnan, Ph.D.


Troy Abell, Ph.D.

**Effects of Stress on the Psychological Symptoms and General Health
of Rural Primary Care Patients**

Though farming has been ranked as one of the most stressful occupations (Smith, Culligan, & Hurrell, 1977), there are few studies that have examined stress and the psychological and general health effects of stress on either rural families or farm families (Walker & Walker, 1988a). This is likely due in part to the realization that a literature of rural psychology has been slow to develop (Murray & Keller, 1991). At the present time, much of the existing data relevant to rural populations is from the fields of rural sociology and rural health (Murray & Keller, 1991), and there is but a limited amount of literature pertaining to rural mental health (e.g., Flax, Wagenfeld, Ivens, & Weiss, 1979; Keller & Murray, 1982; Murray & Keller, 1986; National Mental Health Association, 1988; Wodarski, 1983).

In addition to the lack of research on rural inhabitants' mental well-being, another important problem exists and involves mental health services to treat rural dwellers. Given the high levels of stress incurred by rural inhabitants, one might assume that well-trained mental health professionals would be embracing rurals as a group in need of their services; such an assumption would be misguided. It was nearly three decades ago that the federal government, through the National Institute of Mental Health, first became involved directly in collecting rural demographic and sociocultural data and awarded several small rural mental health research grants (Hutner & Windle, 1991). By the mid-1970s, this research and data collection led to the realization that the rural mental health venue suffered from a dearth of treatment

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facilities and a lack of people trained to provide mental health care (President's Commission on Mental Health, 1978; Task Panel on Rural Mental Health, 1978). Compounding this problem has been the recognition that many of the existing approaches to rural service delivery were and still are inappropriate to the needs of those being served (Task Panel on Rural Mental Health, 1978). Numerous factors, however, do apparently contribute to the aforementioned realizations.

It has long been known that psychology itself is an urban profession with most providers of mental health services concentrated in urban areas leaving most rural areas inadequately served (Murray & Keller, 1991). This is not too surprising when one becomes aware of reports showing that the strongest correlates of the absolute number of licensed psychologists in a given area are population size (Richards & Gottfredson, 1978) and density (Keller, Zimbelman, Murray, and Feil, 1980). Also, of the combined psychology and psychiatry personnel that treat rural populations, 39.9% are based in hospitals as compared to only 18% for America as a whole (U.S. Department of Health and Human Services, 1986). This means then that the rural mental health services that are available depend inordinately on the stability of rural hospitals (Human & Wasem, 1991). To attenuate these circumstances, some have suggested that the best method for getting more qualified professionals interested in rural service delivery is to reduce demand in metropolitan areas (Murray & Keller, 1981). However, such suggestions are short-sighted, for rural areas have many characteristics that are problematic to establishing professional services.

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Some rural locations are perceived as inhospitable, remote, and physically unattractive (Alcohol, Drug Abuse, and Mental Health Administration [ADAMHA]; 1978). Adding to these perceptions is the reality of rural habitation wherein rural dwellers are settled across large areas with relatively low density, compared to their urban counterparts, making treatment service delivery more costly, less available, and less accessible (Bedics & Doelker, 1983; Human & Wasem, 1991). To put this more graphically, the typical rural mental health service delivery area covers about 5,000 square miles, while the largest such area covers more than 60,000 square miles and has a population that is sparse and isolated in small communities (Flax, et al., 1979). One might think that all of these factors together would have spawned countless studies seeking to solve the problems inherent in the delivery of rural mental health services, but as yet, researchers have been much more concerned with service issues related to urban populations (Murray & Keller, 1981). For instance, environmental psychology has devoted a great deal of attention to the problems resulting from urban crowding while virtually ignoring the problematic nature of rural isolation (Murray & Keller, 1981). All of this has occurred in spite of the knowledge that isolation from professional colleagues creates special training needs for those aspiring to become professionals so as to work with rural folks (Hargrove, 1982; Mazer, 1976). Furthermore, despite the special training needs that being an effective mental health professional require, few educational programs currently exist to meet those needs, as most mental health training programs are located in urban areas and offer an urban, specialty bias (Human & Wasem, 1991).

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Thus, as can be seen, the rural community is unique in many regards, and the need for well-trained mental health care professionals is pronounced (Hutner & Windle, 1991; National Institute of Mental Health [NIMH], 1986; Phillips & Murrell, 1994; Schneider, 1982; Task Panel on Rural Mental Health, 1978). Along with this recognition comes the call for a greater focus by researchers on the quality of life and the role of stress in the psychological and physiological well-being of rural people (Breznitz & Goldberger, 1982; Murray & Keller, 1981). Therefore, before delineating the research questions of this study proposing to examine the association between stress and the mental and general well-being of patients in a rural primary care setting, a review of the literature will follow. This review will focus on what the literature presents about (a) the definition of rurality, (b) the characteristics and other factors which influence the help-seeking behavior of rurals, (c) the stressors most commonly encountered by rural people, (d) the primary psychosocial factors most commonly recognized as helping rural inhabitants buffer the effects of stress in their environments, and (e) the relationships shown to exist between rural stressors and the psychological and physiological health of rurals.

Review of the Literature

Rurality

Rural America comprises a group of people with a great diversity of cultures, occupations, wealth, lifestyles, and physical geography that virtually defies characterization in any brief description (Murray & Keller, 1991). It has long been inaccurate to assume that the "ruralness" of an area equates to the idea of agriculture,

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for census figures revealed that by 1977 there were about three times as many factory workers living in rural America as there were farmers (Coward & Jackson, 1983). Indeed, farming is only a small part of what rural America is about (Olson & Schellenberg, 1986). As of 1990, the U.S. census showed that 24.8% of America's population was considered rural; by contrast, only 1.6% of Americans lived on farms (Facts on File, 1992). Given that 1980 census figures showed 2.7% of our population living on farms (Facts on File, 1981), there was over a 40% decrease in the number of farmers in rural America during a ten year period. Given that the number of our nation's farmers has steadily decreased through the years (Swanson, 1985) and anticipating the continuation of this trend, it seems likely that being rural will eventually have very little to do with much that is farm related. Looking at the composition of the rural population from a different perspective, by the mid-1980s about 29% of the nonmetropolitan counties in this country were farming dependent, 28% were manufacturing dependent, 21% were retirement dependent, and 8% were mining and energy dependent. However, the farming dependent counties accounted for only 13% of the rural population, whereas, 40% of the country's rural population resided in the manufacturing dependent counties (Bender et al., 1985).

Many of the studies present today have not defined rural for their purposes, but of those that have, population criteria have been used by most, multidimensional definitions have been used by very few, and even fewer have relied on multiple quantitative criteria (Murray & Keller, 1991). The U.S. Bureau of the Census (1978) defined rural populations as consisting of people who live in places or towns of less

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than 2,500 inhabitants and in open country outside the more densely settled suburbs of metropolitan cities. As for farms, according to census figures for 1990, an occupied one-family house or mobile home is classified as a farm residence if the housing unit is located on a property of one acre or more and if at least \$1,000 worth of agricultural products were sold from the property in 1989 (U.S. Bureau of the Census, 1993). By contrast, the definition of metropolitan is based on the designation of metropolitan statistical areas (MSAs) which have a total population of at least 100,000 (75,000 in New England), comprise one or more central cities with at least 50,000 inhabitants, and include areas that are related to the central city both socially and economically (U.S. Bureau of the Census, 1989). Thus, as can be seen, rural areas contain a rich diversity of land and people, and there is considerable distinction between rural or farm and metropolitan defining criteria. Nonetheless, the criteria used to define "rural" are still rather vague and arbitrary, so for the purposes of this study, people living outside metropolitan statistical areas will be defined as rural inhabitants.

Correlates of Help-Seeking Behavior

Much of what is known about the correlates of help-seeking behavior has been garnered from studies of the general population, and a review of the literature pertaining to help seeking reveals that a number of variables are associated with such behavior (Phillips & Murrell, 1994). It has been found that the stronger the social system, as determined by the number of relatives and close friends accessible to individuals, the less likely it is that formal psychological services will be sought (Birkel & Reppucci, 1983; Linn & McGranahan, 1980). Supporting these findings are

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results from other studies showing that those who lack informal sources of support are more likely to turn to professional mental health care providers for the psychological help they may need (Bosmajian & Mattson, 1980; Goodman, Sewell, & Jampol, 1984). However, the individuals most inclined to seek professional mental health care are those who report elevated levels of emotional distress (Veroff, Kulka, & Douran, 1981; Ware, Manning, Duan, Wells, & Newhouse, 1984), consider their mental health status as poor (Leaf et al., 1985), and exhibit symptoms of a mental disorder (Boyd, 1986; Yokopenic, Clark, & Aneshensel, 1983). Reports suggest that for individuals to simply know they are under stress is enough to get them to consider seeking mental health care but that this alone may not actually lead them to request such services (Cohen, Barbano, & Locke, 1976; Silverman, Eichler, & Williams, 1987). This should not be considered an insinuation that stress is not related to mental health care use, for it is; it may be that the relationship may pertain only to certain qualities or types of stressors (Phillips & Murrell, 1994). As an example, acute stress appears to promote help seeking and use of some form of mental health services, and estimates are that nearly half of those who find themselves in crisis contact a professional helper such as a mental health care provider, a general medical practitioner, or a member of the clergy (Veroff et al, 1981). Additionally, other findings suggest that even though seekers of formal mental health care may not experience a greater number of stressors in their environments, it may be that the impact of those negative events may be significantly stronger than the effects produced by the impact of the stressors experienced by those who do not seek formal psychological services (Goodman et al., 1984).

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Certain sociodemographic variables correlate significantly with help-seeking behavior for psychological maladies. Women have been found to admit more frequently than men to psychological problems and to seek both informal help and professional treatment when subjected to emotional distress (Butler, Giordano, & Neren, 1985; Horwitz, 1977; Kessler, Brown, & Borman, 1981). Help-seeking attitudes toward psychological services and utilization rates for various service delivery settings may vary with differences in race (Broman, 1987; Hall & Tucker, 1985; Redick & Taube, 1980). Receptivity to and actual use of professional services for psychological problems vary directly with educational attainment and income level, and both acceptance and use are more common among urban dwellers (Leaf, Bruce, Tischler, & Holzer, 1987; Veroff et al., 1981).

Phillips and Murrell (1994) studied help-seeking among older adults by comparing 120 adults who were 55 years of age or older and were needing and seeking health care services for stress-related problems to a group of adults in the same age range who were not needing health care for similar problems. Their study produced some interesting findings. Women sought the help of a doctor more frequently than did men, but men were significantly more likely to visit a mental health center than were women. Urban and rural differences were also examined, and it was found that urban dwellers received services for mental health problems from mental health centers and ministers at a higher rate than their rural counterparts. However, no differences were found between the two subgroups in utilization rates of physicians. Poorer psychological well-being and physical health, higher levels of undesirable

negative events preceding and concurrent with help seeking, and weaker perceived social support were all acknowledged at significantly higher rates by help seekers than by those not seeking help. Interestingly, sociodemographic, service availability, and social integration variables contributed comparatively little to the discriminant function of the previous finding. Stressful events such as bereavement, other social losses, material or job losses, and new physical illnesses were reported by significantly more older adult seekers. A greater proportion of the seekers had medical problems that required a doctor's care and that necessitated hospital care than did nonseekers, but there was no difference noted between the two groups with respect to need for a home health service. Finally, those who needed and sought professional help for mental health problems, when evaluated prior to actually needing help, reported poorer psychological well-being, more physical health problems, higher levels of unpleasant stressful events, and greater perceived deficits in the amount of social support available to them in time of need than the older adult nonseekers. Again, sociodemographic variables contributed little to the dimension on which help seekers and nonseekers differed.

The literature pertaining to mental health care utilization by rural inhabitants seems to paint a picture of a group in need but who, for various reasons, are less likely than their urban counterparts to either seek out or use the services offered by mental health care professionals. Human and Wasem (1991) offered a framework consisting of three concepts in which to consider rural mental health delivery issues: availability, accessibility, and acceptability.

Rural Stress

The first of these concepts is *availability* which refers to the existence of mental health services. As we have seen, mental health service providers are concentrated in urban areas leaving rural areas with inadequate services (Murray & Keller, 1991). In addition to this problem, it has been shown how mental health services are largely dependent on the stability of rural hospitals (U.S. Department of Health and Human Services, 1986).

Secondly, is the issue of *accessibility* which refers to access to services in terms of ability to get and purchase such services (Human & Wasem, 1991). Rural accessibility is limited by the large distances that must be traveled in order to obtain services (Bedics & Doelker, 1983; Flax et al., 1979; Task Panel on Rural Mental Health, 1978), the lack of public transportation in most of rural America (Human & Wasem, 1991), and the lack of mental health outreach services (Human & Wasem, 1991). Reimbursement issues can also be problematic as rural Americans are less likely than their urban counterparts to have health insurance (U.S. Senate Special Committee on Aging, 1988), and until passage of the Omnibus Budget Reconciliation Act of 1987 (PL 100-203), many outpatient mental health care services were not covered by Medicare and Medicaid (Rowland & Lyons, 1989); only certain providers were reimbursed for providing services (Human & Wasem, 1991). On top of all these deterrents is foul weather which, depending on the season and the region of the country, can also serve as a major impediment to service delivery and attainment for rural inhabitants (Murray & Keller, 1991).

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The third concept addressed by Human and Wasem (1991) is *acceptability* which refers to the offering of services in a manner congruent with local values through a mode of delivery appropriate for the setting. Although great diversity exists in rural America, certain generalizations can be made. Studies have shown that rural people are known to believe strongly in self-responsibility (Moon & Graybird, 1982), self-sufficiency (Anderson, 1976; Bedics & Doelker, 1983), and self-reliance in solving one's own problems (Dengerink & Cross, 1982). In addition, rural dwellers tend to know less than their urban counterparts, in general, about emotional disorders and mental health services (Hutner & Windle, 1991; Wagenfeld & Buffum, 1983; Wagenfeld & Wagenfeld, 1981). Also, rural people seem to report fewer mental health symptoms simply because they either do not define symptoms as a mental health problem or they are reticent to acknowledge the symptoms (Weinert & Long, 1987). Furthermore, depending on how the problem is defined, rural dwellers have been found to differentiate in terms of what are viewed as appropriate sources of assistance (Fehr & Tyler, 1987). It is, perhaps then, more common for rural people to rely on the family, the clergy, other natural helpers, or the family physician as opposed to professional mental health agencies for help in dealing with their problems resulting from stress (Kenkel, 1986). Acceptability of mental health services can be negatively impacted by all of the preceding beliefs, values, traditions, and understandings. Ergo, it may not be surprising to find that there is also a significant stigma attached to seeking and obtaining help with mental health problems in rural society (Adams & Benjamin, 1988; Berry & Davis, 1978; Buxton, 1976). To top off the aforementioned

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problems with acceptability, one can add the fact that many providers come to rural areas with an urban orientation and training which may make it difficult for such providers to relate to the rural setting and value system and, in turn, rural individuals may mistrust the providers (Berry & Davis, 1978; Buxton, 1976; Human & Wasem, 1991).

Thus, as can be seen, numerous correlates of help-seeking behavior exist. The characteristics of one's social system, the mental health status and symptomatology of the individual, and qualitative and quantitative aspects of the various stressors can all produce an effect on such behavior. Certain sociodemographic variables have been shown to correlate with help-seeking behavior, also. Finally, the concepts of availability, accessibility, and acceptability all include factors which create a great deal of variation in how mental health services are utilized in the rural community.

Major Rural Stressors

Before moving into an examination of the stressors that produce the greatest impact on the daily lives of rural people, it is important to look at how stress is defined in the literature. Several current theorists view stress as something which occurs due to the relationship between an individual and the environment (Lazarus & Folkman, 1984; Pervin, 1968; Taylor, 1986). In other words, stress is the subjective reaction of an individual to his or her appraisal of environmental demands known as stressors (Walker & Walker, 1987b). Conceptually, stress is a process of appraising events (stressors) and reacting with personal distress (stress) in the absence of appropriate coping strategies (Walker & Walker, 1987b).

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Certainly there is an abundance of facts suggesting that many of our rural inhabitants are in the throes of powerful stressors. Smith, Colligan, and Hurrell (1977) reported that the National Institute for Occupational Safety and Health performed a study of 130 occupations and concluded that farming ranked among the 10 most stressful. Between the years of 1970 and 1990, the percentage of jobs in the United States classified under farming, forestry, and fishing decreased by just over 35% (Facts on File, 1992). In 1981, twenty-three percent of Americans living on farms lived below the poverty level, while the nonfarm rate was 13.8% (Facts on File, 1982). In 1978 it was estimated that 13.5% of the rural population was living in poverty, whereas 10.4% of the urban population was considered to be living below the poverty level (National Rural Center, 1981). These poverty findings could be tied to reports from the same time revealing that in rural areas there was a greater prevalence of malnutrition and infant mortality (Copp, 1976) and higher unemployment rates (Jurich, Smith, & Polson, 1983; Nilsen, 1979) than there were in urban areas. Also, almost two-thirds of all houses had inadequate plumbing (Mikesell, 1977) and about half of all occupied substandard housing (Bird & Kampe, 1977) was in rural parts of the country. Conditions did not seem to improve with time as by 1984, nearly 50% of the 2,040 nonmetropolitan counties in America reported unemployment rates of nine percent or greater as compared with five percent in 1979; between 1981 and 1985, nearly 500,000 American jobs were lost in farming and related industries; while just 25% of the U.S. population lived in rural areas, 38% of those living in poverty lived in rural areas; and of the country's substandard housing, 67% was in rural areas

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(Bergland, 1988). Today, rural residents have a rate of uninsuredness that is about 15% higher than the U.S. average, and qualifying for Medicaid is less likely by the rural poor because so many of them have to continue working (National Association of Community Health Centers and National Rural Health Association [NACHC-NHRA], 1988). Rural areas have traditionally shown a lower proportion of the population working in white-collar jobs, lower median educational attainment and median family incomes, and smaller percentages of men and women participating in the labor force (Watkins & Watkins, 1984). Whether or how the aforementioned facts relate to findings revealed in a National Mental Health Association (NMHA, 1988) report remains uncertain. Nonetheless, it is interesting that the NMHA report indicated that there were increased rates of alcohol abuse among rural dwellers, that rates of child and spouse abuse were increasing, that the rate of depression among rural youth was twice the national average, and that depression symptoms doubled in certain rural areas between the years of 1981 and 1986. Some investigators have reported that investigations and confirmed cases of child abuse have increased by more than 30% in rural America (Reese, 1986; Wall, 1985). On top of these findings, suicide rates also seem to be on the rise. Ritchie and Ristau (1986) looked at a number of professions and found farming to have the highest suicide rate of all. Also, Hoberman (1987) reported the rate of suicide in one rural sample to be 15 times greater than the national average. So, how does one begin to assess the severity of the stressors facing rural inhabitants, and what do rural people actually see as the stressors which are most problematic for them?

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Weigel (1981) polled 319 farm residents in northeastern Iowa to determine which factors contributed most to the severity of stress in rural communities. The findings revealed that severity of stress was determined by four factors: (a) the importance of the event; (b) the duration of the event with severity varying directly with duration; (c) the number of events occurring simultaneously with higher numbers producing greater severity; and (d) the unexpected nature of events with those least anticipated producing the greatest stress. Another study of 1,379 farm magazine subscribers further suggested that the severity of stress may be greatest during peak work seasons (Tevis, 1982). In her summary of the literature pertaining to rural stress, coping, and support, Kenkel (1986,) offered four aspects of rural life which significantly tax the resources of rural dwellers and make coping with the stresses they encounter particularly problematic: "(a) its geography, which includes isolation from other communities and large distances to health, education, business, and entertainment resources; (b) poor economy and heavy reliance on one major industry; (c) its stage of development which might include a boom, or bust, or changing demographics; and (d) the particular stresses associated with the dominant occupations like mining, fishing, ranching, and farming" (p. 462).

As for the stressors reported as most salient in the daily lives of farmers, the literature reveals many. As eluded to previously, rural socioeconomic indicators were quite negative for many years, and this was due in large part to the farm crisis of the 1980s (Murray & Keller, 1991). There have been, however, some recent positive changes in rural socioeconomic indicators (Murray & Keller, 1991), but these positive

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changes may not last long as the number of elderly Americans residing in rural areas increases. More specifically, studies indicate that a substantial portion of the migrants from metropolitan to rural areas are relatively old and retired from the work force (Sofranko, Fliegel, & Glasgow, 1983). In all, nearly 29% of the nation's elderly reside in rural areas (Human & Wasem, 1991). The implications of this are that these individuals could require a disproportionate amount of various services as they become less able to care for themselves (see Scheidt, 1986).

Human and Wasem (1991) wrote about another stressor which continues to affect rural communities: the cyclic boom-and-bust nature of rural economies. For instance, as the authors showed, the 1970s were a boom period for the agriculture industry, but by the mid-1980s this boom had dissipated into a bust that was intensified by a drought. They recounted the importance of understanding that the need for mental health services increases during both bust and boom periods. As the authors explained it, boom periods are characterized by an increase in the number of people moving to rural areas. Such migrations create additional stresses for rural residents and communities (see Lazarus & Folkman, 1984; Weisz, 1979) which, in turn, increases mental health service demand. Boom periods of this nature are too often followed by downswings in the economy and relative bust periods. Economic downswings bring about lower land prices, and unfortunately, the chief means counties have of financing health, mental health, and social services are property taxes. These downswings depreciate farmland values which thus erode the tax base. This means then that rural counties and communities find themselves less able to provide needed

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services. Thus, a vicious cycle develops. During bad times the need for services, particularly mental health services, increases, but as times are bad, the ability to pay for such services is reduced and so too is the ability of communities to provide those services.

Numerous investigators have tried to delineate the stressors most common to rural and farm residents. Tevis (1982) surveyed 1,379 farm magazine subscribers, and the findings suggested a seasonal nature of much farm stress. Of the farmers surveyed, 21% reported experiencing stress on a daily basis, whereas 60% reported experiencing the most significant stress during peak work seasons. Also the following stressors, in descending order, were reported by more than 50% of the respondents: machinery breakdown, harvest, price uncertainties for products sold, machinery costs, interest rates, deciding when to market, planting, weather conditions, and price uncertainties for farm inputs. Weigel (1981) attempted to delineate farm stressors by having 230 men and 89 women of Iowa farm families assign readjustment ratings to the events used on the Social Readjustment Rating Scale (Holmes & Rahe, 1967) in addition to items related directly to farming. Several items peculiar to farming received the highest ratings. For example, machinery breakdown and disease outbreak in farm animals were rated higher than divorce or major illness. Similarly, another study found high stress ratings assigned to valuable animal dies, loss of help or no help needed, high debt loans, production loss due to disease or insects, poor cash flow to meet obligations, weather-caused delays, and government regulations, while getting married was seen as only minimally stressful (Miller, Bentz, Aponte, & Brogran,

1974). Several researchers questioned farm participants during the depression of the 1980s and found with virtual unanimity that financial concerns were the foremost producers of stress (Keating, Doherty, & Monroe, 1986; Marotz-Baden & Colvin, 1986; Murray, 1985; Olson & Schellenberg, 1986; Schellenberg, Olson, & Fuller, 1985; Walker, Walker, & MacLennan, 1986; Walker & Walker, 1987a). Rosenblatt and Anderson (1981) identified a number of farm stressors including wide seasonal variations in work requirements, an irregular and unpredictable income, substantial financial investment and risk, and the relative isolation from support systems and services. Another interesting finding of this and other studies was that farm stress was also derived from multigenerational family members working together on a common enterprise. More specifically, almost all couples have to endure a multitude of decisions about the division of household chores, but farm couples have the added task of defining each spouse's role in the farm's management, its financial direction, and involvement in manual farm labor. Many women experience some amount of role conflict which involves their own perceptions about the extent of their obligations, and this conflict appears to produce little stress. However, when there is a difference in agreement between wife and husband about the wife's role in the farming operation, referred to as role incongruence, stress is encountered, and it is the degree of this incongruence which has been found to contribute significantly to psychological stress in farm women (Berkowitz & Hedlund, 1979; Hedlund & Berkowitz, 1979). Hedlund and Berkowitz (1979) interviewed 20 New York farm families during a seven-year period and found that 75% of the families reported some family derived stress. These

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familial stressors were related to role incongruence regarding the nature and extent of the wife's involvement in the farm business as opposed to mothering duties and to boundary ambiguity resulting from changing roles and shifting authority as the farm business was transferred from one generation to the next. Another familial stressor reported in the study was sibling competition regarding farm business. Berkowitz and Perkins (1984) looked at the relative contribution to stress of work-related and family-related variables in a sample of 126 farm wives and also found that significant stress was derived from conflicts between the demands of their work role and their family role. An important mediator in this sample of the stress derived from role conflict was the degree of support received from the husband.

Jevne (1979) suggested that it is the ever-changing life style of farming that is stress producing for farmers, as farming has evolved from a largely physical occupation into one that requires an increasing understanding of technological advances and a wide range of intellectual capabilities. The restriction and irregularity of cash flow, the need for large capital investment, and the financial risk necessary to maintain a modern farming operation has been cited by numerous researchers as a major component of the economic pressure facing today's farmers (Keating, Doherty, & Munroe, 1986; Kohl, 1971; Rosenblatt & Anderson, 1981; Walker, Walker, & MacLennan, 1986; Walker & Walker, 1987a). Stress has also been found to vary as a function of the type of farming operation. Farmers raising both livestock and grain demonstrated higher levels of stress than grain farmers (Walker & Walker, 1987a). In the same study, younger farmers were found to show significantly higher stress scores

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than older farmers. The authors surmised that these findings were due in part to the generally higher debt loads carried by younger farmers and to feelings of a lack of power from living on a multigenerational farm where they had less control over the operation than they wanted. Working off the farm in addition to their regular work has also been found to relate to higher stress scores compared to those for farmers working solely on the farm (Walker & Walker, 1987a; Walker & Walker, 1988a).

We have seen that stress is a process of perceiving, appraising, and reacting with personal distress in the absence of appropriate coping strategies. It has been shown that rural living is associated with numerous problems and stresses. It appears that there are factors which contribute to the severity of rural stress and other factors which tax the coping resources of rural dwellers. Rural and farm living are replete with stressors related to economic conditions, seasonal changes and demands, market fluctuations, weather conditions, crop failure, animal diseases and dies, machinery costs relative to purchases and upkeep, and problems related to isolation. Role incongruence for wives and other familial stressors derived for multigenerational involvement in farm operations, as well as, the type of farming operation and the age of the farmer all seem to impact the level of stress experienced by farmers. All of this can seem overwhelming and leads one to wonder what rural inhabitants do or can do to mitigate the impact of the stressful situation in which they dwell. This is what is examined next.

Stress Buffering Psychosocial Factors

Having looked at the stressors most frequently encountered by rural citizens and having delineated factors which contribute to the severity of stress and compromise the coping abilities of rural dwellers, one may wonder what, if anything, rural people do or can do to lessen the impact of stressful experiences. Numerous studies suggest that rural communities and individuals possess a variety of attributes which seem to serve as mitigating factors (i.e., Birkel & Reppucci, 1983; Granovetter, 1973; Husaini, 1982; Turner, 1983). For instance, there is a considerable amount of evidence in the life stress literature supporting the hypothesis that social support can serve as a stress-buffering agent (Dean & Lin, 1977; Husaini & Linn, 1984; Mueller, 1980). Others seem to agree saying their findings show that it is the actual availability of social support that is of prime importance in mitigating the effects of stress (Newton, 1988). However, some researchers suggest that subjective perceptions of support may be even more crucial for effective stress management and the maintenance of psychological well-being (Liang, Dvorkin, Kahana, & Mazian, 1980; Vaux, 1987). Weinert and Long (1987) concluded from their study of rural Montanans that the perceived high level of social support reported was the primary factor in determining the low levels of observed depression and anxiety.

Psychosocial factors enabling the elderly to buffer the effects of stress in their lives have also been examined. Korte (1990) looked at elderly people in general and identified three aspects of social support systems that appeared particularly relevant to their state of well-being. First, ties that were informal and voluntary seemed more

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important than ties that were the product of organizational affiliations, formal roles, and kinship. Second, well-being appeared to be very closely linked to whether or not an elderly person had a social tie to someone who functioned as a confidant. Third, standards used to assess the well-being of the elderly could be as relevant to the level of well-being they report as the objective conditions of their social relationships. Gupta and Korte (1990) added that for optimal well-being to occur, the elderly seem to need people in their environment in addition to a confidant.

Some other factors have been commonly cited as attributes of rural communities and individuals and noted as effective in attenuating the negative effects of certain stressors affecting rural populations. Interdependence and cohesiveness are two such factors noted in the literature from the mid-1980s as potent mitigators of the stresses associated with the economic crisis of that decade which caused particular hardship for many of America's rural inhabitants (Fickenscher, 1988). Keating (1988) noted that rural families are solution oriented as opposed to crisis oriented, and one of the solutions which has been cited frequently in the literature as a preferred mechanism for coping with stress in farm families is reframing (Jurich & Russell, 1988; Marotz-Baden & Colvin, 1986; Walker & Walker, 1988b). Reframing neutralizes the destructive nature of an event by identifying the positive function of the problem and redefining the situation in a manner which is less destructive and, thus, more useful; farmers apparently use this technique quite effectively for stress management (Wilson, Marotz-Baden, & Holloway, 1991).

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So as we have seen, social support, be it actual or perceived, seems to be a very important mitigating factor of the stresses common to rural Americans. In addition, however, it appears that social support alone cannot be credited for observed buffering effects. The degrees of interdependence and of cohesiveness of the social support system along with abilities to see the positive contributions of what could be seen as totally negative experiences also seem to play important roles as agents of stress attenuation.

Rural Stress as it Relates to Psychological and General Health

Only a few studies exist that actually attempt to enumerate the psychological and general health problems incurred by rural inhabitants as a result of the stresses to which they are exposed (e.g., Donham & Mutel, 1982; Kenkel, 1986). Some have compared occurrence rates of stress-related problems between rural and urban samples (e.g., Flax, et al., 1979; Wagenfeld, 1982), but only two studies can be found that attempt to predict the occurrence of mental health problems in rural participants resulting from environmental stressors (Templeman, Condon, Starr, & Hazard, 1989; Walker & Walker, 1987b). Nonetheless, rural and farm men and women are reporting numerous stress-related problems in the existing studies.

Walker and Walker (1988a) used a nonrandom sampling technique to look at stress-related symptoms in 817 Canadian men and women who were involved in farming as their principal occupation. Their results indicated that the sample reported a variety of symptoms commonly associated with chronic stress. The most frequently reported symptoms included chronic fatigue, forgetfulness, loss of temper,

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concentration difficulties, back pain, and sleep disruptions. Nearly 50% of their participants reported moderate to high frequencies of occurrence for symptoms of trouble relaxing, loss of temper, and fatigue. Over 30% of the participants also reported moderate to high frequency occurrence for symptoms related to difficulty concentrating, back pain, sleep disruptions, avoiding decisions, increase in arguments, and weight gain or loss. The investigators also found self-reported symptom levels to differ as a function of a number of demographic variables. For instance, women showed significantly higher symptom scores than did males. Age was also found to be related to symptoms as farmers over the age of 50 recorded fewer symptoms than those who were under the age of 50. Symptom scores were elevated significantly for farmers in mixed grain and livestock operations as compared to solely grain-farming operations. Off-farm employment also was found to correlate positively with higher symptom reports. In addition, comparisons were carried out between farm men and women and nonfarmers with the farm sample reporting significantly higher symptom levels than their nonfarm counterparts. The symptoms determined to best differentiate between the farm and urban groups included loss of temper, back pain, increased drinking, behavior problems in children, and forgetting things. Some reviewers have cautioned, though, that the evidence needed to make definitive statements about rural-urban differences in stress-related symptomatology is simply unavailable (Flax et al., 1979; Kenkel, 1986; Wagenfeld, 1982). Joslin and Rosmann (1986) suggested that women may be more likely to be the symptom bearers of stress in farm families. The authors speculated that the reasons for this could be due to their roles as emotional

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leaders in family functions, as well as, the possibility of excessive demands being put on women as they are forced to seek off-farm employment to help relieve financial pressures. Epidemiologic studies from the 1970s found that agriculture subgroups have a high rate of disability from chronic disease, especially impairment of the back and spine, arthritis, heart disease, respiratory disease, and mental disorders (Donham & Mutel, 1982).

Several studies have investigated the occurrence of stress-related psychological problems in rural populations. Weigel (1981) looked at self-report measures derived from a group of Iowa farm residents. Participants were asked to report their perceived reactions to stress and listed several in the following descending order: physical discomfort, emotional outbursts, inability to relax, mental confusion, depression-anxiety, excessive fatigue, and apathy. One study looked at anxiety among farm women and found anxiety scores not to differ from norms for adult women (Hertsgaard & Light, 1984). However, the anxiety scores were related to the degree to which the women were involved in the decision-making processes related to the operation of the farm. Knudsen and Wilson (1985) surveyed Saskatchewan farmers and found that 80% experienced stress-related symptoms with the most frequently reported symptoms being headaches, fatigue, and sleeplessness. As previously mentioned, NMHA (1988) reported increased rates of alcohol abuse among rural dwellers, increasing rates of child and spouse abuse, rates of depression among rural youth that were nearly twice the national average, and a doubling of depression symptoms in certain rural areas between the years of 1981 and 1986.

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Walker and Walker (1987b) attempted to identify the occupational stressors of farm life which were best predictive of distress levels in farmers. The authors found the best predictor of symptoms for both men and women was "problems in balancing work and family responsibilities" (p. 377). For men the major stressors in descending order of importance were problems in balancing work and family responsibilities, personal illness during planting or harvesting, conflict with spouse over spending priorities, no farm help or loss of help when needed, worrying about keeping the farm in the family, death of a friend, farming-related accident, having to travel long distances for service, surface rights negotiations, and machinery breakdown at a critical time. The most stressful events, in descending order, predictive of symptoms for farm women were problems in balancing work and family responsibilities, conflict with spouse over spending priorities, pressures in having too much to do in too little time, government cheap food policies, major decisions being made without my knowledge or input, death of a friend, worry about owing money, feeling isolated on the farm, need to learn and adjust to new government regulations/policies, and concerns about the continued financial viability of the farm. The investigators also performed two stepwise regressions of their data to determine the relative importance of various symptoms in predicting the total symptom scores for both men and women. Both groups shared four of the same predictors: trouble concentrating, sleep disruptions, change in health, and increase in arguments. For men, back pain was one of the top five predictors of total symptoms, while for women, losing temper was one of their top five major predictors. In an attempt to develop the Rural Experiences

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Questionnaire (REQ; Templeman et al., 1989) to assess the recent life events and their impacts on people living in rural areas, Templeman et al. (1989) administered the REQ to 17 psychiatric outpatients and to 29 male and female participants in a wellness workshop conducted by one of the authors. The workshop participants served as a nontreatment comparison group for the study. One of the study's hypotheses was that "the negative impact of recent life events as measured by the REQ should be positively correlated with admission levels of depression" (p. 44). Another of the hypotheses was that "rural events with negative impacts should also be associated with higher levels of anxiety and depression" (p. 44). The first hypothesis was modestly supported in that the REQ total score correlated positively with depression for the outpatient group. The latter of the hypotheses was not supported, but there was support for the possibility that positive rural experiences could in fact lessen the level of anxiety or depression experienced in an otherwise stressful environment.

Thus, as we have seen, there are few studies which look at the prevalence of psychological or general health symptoms of stress in rural people. Studies attempting to predict stress-related symptoms or that even try to correlate frequencies of occurrence of stress and symptoms are rare. Some differences in symptomatology seem to exist between men and women in one study, but no replication studies exist to support those findings.

Rationale and Research Questions

The need for studies addressing how the stresses of rural life predict, either in combination or individually, the mental and general health of rural inhabitants seems

very clear. Indeed, there are those who have highlighted the need for such research and have pointed out the clinical and policy implications of such research as justification for their proclamations (Breznitz & Goldberger, 1982; Linn & Husaini, 1985). Thus, this study is proposed to answer the following questions and hypotheses:

Research Questions

1. Which stressors are most commonly experienced by the rural participants in this study?
2. Which psychological problems are most commonly experienced by the rural participants in this study?
3. Which general health problems are most commonly experienced by the rural participants in this study?
4. What stressors individually or in combination relate to mental health symptoms in this sample of rural people?
5. What stressors individually or in combination relate to general health symptoms in this sample of rural people?
6. Which of the three formal assessment instruments will be most predictive of utilization of primary care services for this rural study group?
7. How do the BSI scores of this rural study group relate to the BSI scores of the normative sample?
8. How do the DUHP scores of this rural study group relate to the DUHP scores of the normative sample?

Hypotheses

1. The total REQ score will be negatively correlated with the total BSI score for this rural study group.
2. The total REQ score will be positively correlated with the total DUHP score for this rural study group.
3. The total BSI score will be negatively correlated with the total DUHP score for this rural study group.
4. The total score on the REQ will be negatively correlated with utilization of primary care services for this rural study group.
5. The total score on the BSI will be positively correlated with utilization of primary care services for this rural study group.
6. The total score on the DUHP will be negatively correlated with utilization of primary care services for this rural study group.

Method

Participants

Between 200 and 250 adults will complete the battery of instruments to be used in this study. The participants must be 18 years of age or older, and both males and females will be eligible to participate. All participants will be gathered from the client population of a primary care facility, as agreed to by the owner/physician of that facility. The primary care facility is located in a rural community with a population of less than 3,350 people (U.S. Bureau of the Census, 1993). The community itself is situated in the western part of Oklahoma, and when traveling by road, it is more than

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60 miles from the nearest metropolitan statistical area (see Appendix A). More exact demographics of the area's inhabitants will be garnered from the Personal Information Questionnaire (PIQ; to be discussed subsequently) which each participant will complete.

Measures

There are four instruments, besides the informed consent form, each participant will be asked to complete. Included in this group are the Rural Experiences Questionnaire (REQ; Templeman et al., 1989), the Brief Symptom Inventory (BSI; Derogatis & Melisaratos, 1983; Derogatis & Spencer, 1982), the Duke-UNC Health Profile (DUHP; Parkerson et al., 1981), and a personal information questionnaire developed by the principal investigator and his faculty sponsor. A copy of each instrument can be found in Appendix B, and a description of each will follow.

Rural Experiences Questionnaire (REQ). The REQ is a self-report instrument designed to assess the impact of recent life events on rural people (Templeman et al., 1989). To accomplish this task, the instrument comprises seven subscales. Each of the subscales assesses a number of life events that have been identified in the literature as rural events which are stressful for most people (Templeman et al., 1989). The subscales are individually entitled "Work-Related Events," "Financial Events," "Living Conditions," "Family-Related Events," "Relationship Events," "Rural Events," and "Miscellaneous Events." The number of "events" in each scale varies from seven to 16. Events are rated according to how negatively or positively they impacted the respondent's life during the past 12 months

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with a -3 rating being extremely negative (EN), -2 connoting a moderately negative (MN) impact, -1 indicating a slightly negative (SN) impact, 0 meaning no impact (NI), +1 for a slightly positive (SP) impact, +2 meaning the event's impact was perceived as moderately positive (MP), and +3 representing an extremely positive (EP) event. If the event did not occur in the respondent's life during the past 12 months, then X for not applicable (NA) is to be circled (Templeman et al., 1989). Though the authors offered no indication of the amount of time it takes to complete the REQ, it is estimated that it would take no more than 15 minutes to complete the instrument's total of 72 items.

Currently, only one study reports any findings relative to the use of the REQ, and that study was performed by the instrument's developers. After testing several versions of the REQ on hospitalized psychiatric patients, Templeman et al. (1989) tested the present version, the one to be used in this study, on participants in a private psychiatric inpatient unit ($n = 50$), a state hospital psychiatric unit ($n = 17$), a private psychotherapy practice ($n = 12$), and the general public ($n = 27$). All participants were from Oregon and women outnumbered men in all samples except the private practice where men outnumbered women by more than three times. In addition to the REQ, Templeman and his associates administered a measure of depression, the Beck Depression Inventory (BDI; Beck, 1967), to all private hospital patients within 24 hours of admission, to all state hospital patients once they were stabilized on medication, and to all psychotherapy clients within the first two or three sessions. Additionally, a measure of anxiety, the State-Trait Anxiety Inventory (STAI;

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Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983), was administered to all patients and clients at the same time as the BDI. The researchers had hoped to evaluate the relationship of life stress to depression and anxiety by administering the REQ, the BDI, and the STAI to all but the nonpatient participants who were to serve as controls.

In their results, Templeman et al. (1989) found no significant main effect of gender ($F [1, 104] = 2.78, p > .05$) for the REQ total scores for men and women at all four locations of the study. However, post hoc Scheffé's test indicated that mean REQ totals for men in the state hospital were significantly higher than for women in the same sample, $t (104) = 3.36, p < .01$. However, that sample was quite small ($n = 17$); the extremely high scores of two of the male participants skewed the men's mean REQ total.

Templeman et al. (1989) attempted to determine the relationship between the subscale items and the measures of anxiety and depression. Small, generally positive correlations were noted for each measure within the private hospital sample, but none were statistically significant. This led the researchers to conclude that negative rural events were not in themselves good predictors of presenting anxiety or depression in psychiatric patients. Despite these findings, the researchers did find the REQ total score to correlate positively with depression in the sample of private psychiatric hospital patients. However, within their sample of psychiatric patients (it was not reported whether these patients were from the private hospital sample, the state hospital sample, or from the two combined) they discovered that nine of the men and

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seven of the women reported more positive than negative rural events in their lives. Thus this group was compared with the remainder of the sample who had not experienced a balance of positive rural events on measures of anxiety and depression. The results indicated that the positive rural sample presented with significantly less state anxiety, $t(16) = -2.08, p < .05$, and depression, $t(16) = -2.13, p < .05$. The clinically significant results could not be explained by the effects of gender, as a 2×2 ANOVA with gender and the rural events groups yielded no significant differences for either the STAI or the BDI.

To date, no independent studies pertaining to the reliability and validity of the REQ have been found in the literature. Though it appears to have good face validity, stability and cross-validation studies will have to be performed before the instrument's reliability and validity can be fully determined. Nonetheless, the developers of the REQ assert, from their clinical experience with the instrument, that it shows promise as a useful clinical and research instrument for evaluating stressful life events in rural populations.

Brief Symptom Inventory (BSI). The BSI is a self-report, 53-item measure that can be used with individuals who have a minimum of a sixth-grade reading level (Boulet & Boss, 1991). It usually requires less than 10 minutes to complete with one or two of those minutes typically allotted for administrative instructions (Derogatis & Melisaratos, 1983). It was designed to reflect the point-in-time psychological symptom status of psychiatric and medical patients, as well as, individuals who have not been assigned patient status. The BSI may be utilized repeatedly either to

document trends through time or in pre-post evaluations (Derogatis & Spencer, 1982).

It has been applied successfully with a broad range of individuals such as formal psychiatric patients, prison populations, patients with drug and alcohol problems, and individuals with sexual dysfunctions. In medical contexts it has been used to validly assess general medical patients, patients with cardiovascular disorders, chronic pain patients, cancer patients, and individuals with a number of other dysfunctions and complaints (Derogatis & Spencer, 1982).

Essentially, the BSI is the brief form of the SCL-90-R (Derogatis, 1977, Derogatis & Cleary, 1977a, 1977b; Derogatis, Rickels, & Rock, 1976). It measures nine symptom dimensions, three global indices of distress, and one additional scale comprising four items which are not subsumed under any of the primary symptom dimensions but which actually “load” on several dimensions in a fashion that is not unique to any of them. The four items are retained because they are seen as representing important vegetative and other clinical indicators (Derogatis & Melisaratos, 1983). Hence, they are not scored collectively but are used instead to contribute to the global scores on the BSI (Derogatis, 1975). The nine dimensions are Somatization (SOM), Obsessive-Compulsive (O-C), Interpersonal Sensitivity (INT), Depression (DEP), Anxiety (ANX), Hostility (HOS), Phobic Anxiety (PHOB), Paranoid Ideation (PAR), and Psychoticism (PSY). The three global indices, Global Severity Index (GSI), Positive Symptom Distress Index (PSDI), and Positive Symptom Total (PST), are included with the intention of providing more flexibility in overall assessment of the patient’s psychopathologic status (Derogatis & Spencer, 1982).

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As proposed by Derogatis and Spencer (1982), each of the nine primary symptom dimensions is intended to reflect the distress arising from a distinct problem area. The SOM dimension comprises seven symptoms which together yield some measure of the distress arising from perceptions of bodily dysfunction. Particular attention is given to cardiovascular, gastrointestinal, and respiratory complaints, but other systems with strong autonomic mediation, pain and discomfort of the gross musculature, and additional somatic equivalents of anxiety are included as well. The O-C dimension reflects symptoms often identified with obsessive-compulsive disorder. The six items of this measure focus on thoughts, impulses, and actions that are experienced as unremitting and irresistible by the individual but are of an unwanted nature. In addition, this dimension's items assess behaviors and experiences associated with a more general cognitive performance deficit. The four items of the INT dimension center on feelings of personal inadequacy and inferiority in comparison to others. Individuals who score high on this dimension generally report acute self-consciousness and negative expectancies concerning their communications and interpersonal behaviors with others. There are six problems/complaints comprising the DEP dimension. These items are intended to reflect a representative range of the indications of clinical depression such as dysphoric mood and affect, signs of withdrawal from life interest, lack of motivation, feelings of hopelessness, suicidal ideation, and other cognitive and somatic correlates of depression. The six items of the ANX dimension are representative of symptoms and signs associated with clinically high levels of manifest anxiety. These include nervousness and tension,

panic attacks, feelings of terror, cognitive components involving feelings of apprehension, and some somatic correlates of anxiety. The HOS dimension uses five items to tap thoughts, feelings, or actions generally believed to be characteristic of the negative affect state of anger. These items look at such manifestations by reflecting qualities such as aggression, irritability, rage, and resentment. The five items in the PHOB dimension are intended to reflect manifestations of the particular type of fear which is in close agreement with the classical definition of "agoraphobia" (Marks, 1969), also labeled "phobic-anxiety-depersonalization syndrome by Roth (1959). As it pertains to the BSI, phobic anxiety is defined as "a persistent fear response to a specific person, place, object or situation which is characterized as being irrational and disproportionate to the stimulus, and which leads to avoidance or escape behavior" (Derogatis & Spencer, 1982, p. 14). Accordingly, the items of the dimension focus on the more pathognomonic and disruptive manifestations of phobic behavior. The five items of the PAR dimension are oriented toward representing paranoid behavior as a disordered mode of thinking. Thus, the cardinal characteristics of projective thought, hostility, suspiciousness, grandiosity, centrality, fear of loss of autonomy, and delusions are all represented in the items of this dimension. Finally, the PSY dimension was developed in a fashion representative of the construct as a continuous dimension of human experience from mild interpersonal alienation to dramatic evidence of psychosis. The five items of this dimension are seen as indicative of a withdrawn, isolated, schizoid lifestyle and of symptoms of schizophrenia such as thought control.

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The three global indices of distress associated with the BSI are intended to function as measures which communicate in a single score the level or depth of symptomatic distress currently experienced by the individual (Derogatis & Melisaratos, 1983). The GSI is purported as being the single best indicator of current distress levels, as it combines information on the numbers of symptoms and the intensity of perceived distress. It is recommended that the GSI be used in most instances requiring a single summary measure. The PSDI was designed to measure response style; it gives some indication of whether patients are augmenting or attenuating distress in their manner of reporting. The PST is simply a count of the number of symptoms the patient reports to have experienced to any degree. Thus, the PSDI and the PST are used as adjuncts to the GSI score to yield a more meaningful understanding of the clinical picture (Derogatis & Melisaratos, 1983).

The instructions inform whoever is being readied to take the BSI that they are preparing to look at a list of problems and complaints that people sometimes have. Having read each item carefully, the patient is asked to fill in one of the numbered circles to the right of the item which best describes how much discomfort that problem/complaint has caused the individual during the past week including the present day. The term "number" in the directions refers to the standard descriptor phrases printed above a row of numbers from 0 to 4 accompanying each problem/complaint. The descriptor phrases and associated number of each are "not at all" (0), "a little bit" (1), "moderately" (2), "quite a bit" (3), and "extremely" (4). Once the items are completed, 12 sums of item scores corresponding to the nine

dimensions and three global indices must be computed, and 11 of these must be divided by an appropriate number of items (Derogatis & Spencer, 1982). The results can then be compared to norms for a sample of 1002 heterogeneous psychiatric outpatients, a sample of 719 nonpatient normal participants, or a sample of 313 psychiatric inpatients (Derogatis & Melisaratos, 1983).

In developing the BSI, Derogatis and Spencer (1982) established the internal consistency reliability on a sample of 719 psychiatric outpatients using Cronbach's coefficient alpha (α). They found the alpha coefficients for all nine dimensions to be very good as the coefficients ranged from a high of .85 for the DEP dimension to a low on the PSY dimension of .71. Another study that checked the internal consistency of the BSI using Cronbach's coefficient alpha also produced similar results. Boulet and Boss (1991) used the BSI as part of a larger assessment package to study a sample of 350 consecutive outpatients and 151 consecutive inpatients at the forensic service of a psychiatric hospital. All of the participants had purportedly been involved in some form of deviant sexual activity that required psychiatric assessment and possible treatment, but not all of them had outstanding criminal charges. Boulet and Boss reported the alpha coefficients to range from a high of .89 on the DEP dimension to a low of .75 on the PSY dimension. In another study the BSI was administered at intake to 231 women and 112 men in a counseling center at a large Southeastern university (Broday & Mason, 1991). Again, Cronbach's coefficient alpha was used to calculate the internal consistency for each of the nine symptom scales. These findings were also similar to those of the two aforementioned studies with an alpha of .88 on the DEP

dimension being the highest and .70 on both the PSY and the PHOB dimensions being the lowest alpha.

The test-retest reliability of the BSI was expected by Derogatis and Spencer (1982) to be quite high. Their reasoning was that psychopathology is neither a “highly trait-mediated enduring characteristic” (p. 22) nor is it a “rapidly fluctuating ‘state’ manifestation” (p. 22). Thus, they explained, established symptoms should tend to endure for moderate to substantial periods of time if left untreated; a test measuring psychopathologic manifestation should register high test-retest coefficients over a period of two weeks. Using a sample of 60 nonpatient individuals and testing them across a two-week interval, the BSI developers found the test-retest coefficients to be exactly as they speculated. For the nine dimensions the test-retest coefficients ranged from a low on the SOM dimension of .68 to a high on the PHOB dimension of .91. Test-retest coefficients for the Global Indices were .90 for the GSI, .87 for the PSDI, and .80 for the PST. The authors concluded that these findings gave strong evidence that the BSI is a consistent measure across time.

Alternate forms reliability was evaluated using the SCL-90-R as the “alternate form.” Derogatis and Spencer (1982) admitted that the SCL-90-R is not, in the strictest sense, a different form of the BSI. But since the BSI was directly derived from the SCL-90-R, the BSI’s developers argued that the two tests measure identical symptom constructs. Ergo, correlations for the nine primary symptom dimensions shared between the two instruments were generated. Based upon a sample of 565 psychiatric outpatients, the correlations proved to be very high with the lowest

occurring on the PSY dimension (.92) and the highest being on the HOS dimension (.99). These findings led to the conclusion that, at least for psychiatric outpatients, the two forms measure the same symptom constructs.

The convergent validity of the BSI was determined using data from a previous study of a sample of 209 symptomatic volunteers comparing their scores on both the SCL-90-R with the MMPI (Derogatis et al., 1976). Since the BSI's 53 items are contained within the SCL-90-R, the data set was reanalyzed, scoring for the BSI instead of the SCL-90-R. The reanalysis revealed, by report, excellent convergence, though in some instances the overall magnitudes of correlations of several dimensions were somewhat lower than those found in the earlier study of the convergence of the SCL-90-R and the MMPI. The coefficients between the nine dimensions of the BSI and the clinical scales of the MMPI (Dahlstrom, 1969), the Wiggins Content Scales of the MMPI (Wiggins, 1966), and the Tryon Cluster Scores (Tryon, 1966) were calculated. Seven of the dimensions (Interpersonal Sensitivity, Depression, Anxiety, Hostility, Phobic Anxiety, Paranoid Ideation, Psychoticism) demonstrated maximum correlations with MMPI scales that were viewed as clearly convergent. The magnitudes of maximal correlation coefficients for the former three dimensions were almost identical to those in the SCL-90-R study, but as for the latter four dimensions, the magnitudes of correlations were reduced by about 0.10. In the cases of the Somatization and Obsessive-Compulsive dimensions, the patterns of correlations were retained, but the magnitudes of coefficients decreased by approximately 0.15. The researchers surmised that items deleted from the SCL-90-R in making the BSI

dimensions almost certainly reflected some loss of reliability associated with shortening the scales, though convergent patterns of relationship remained clearly in evidence (Derogatis & Melisaratos, 1983).

Less optimistic findings relative to convergent validity were reported by Boulet and Boss (1991) who also compared the nine BSI dimensions to the MMPI clinical scales. The two researchers reported moderate correlations between the DEP dimension and the MMPI Depression scale ($r = .50$), the PAR dimension and the MMPI Paranoia scale ($r = .51$), the SOM and the MMPI Hypochondriasis scale ($r = .53$), and the PSY and the MMPI Schizophrenia scale ($r = .51$). What was troubling to the researchers was that each of the BSI dimensions correlated significantly with each of the MMPI clinical scales except for the MMPI Masculinity-Femininity scale. Furthermore, most BSI dimensions showed meaningful correlations with unrelated MMPI measured traits. These findings led Boulet and Boss to deduce that the correlations they found demonstrated convergent validity for some BSI dimensions but that they also suggested a low degree of discriminant validity. This conclusion was spawned by the observation that the intercorrelations among the nine BSI dimensions ranged from a low of .55 to a high of .80, demonstrating significant nonindependence of the scales. Additionally, there were notable correlations between the nine dimension scores and the total score for the test (a range from $r = .73$ to .91).

Boulet and Boss (1991) found other problems with the BSI as well. Using a principal-components analysis of the dimension scores to assess the independence of the subscales, an extraction criterion of eigenvalues of greater than or equal to one was

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used to determine the number of components to retain. It was found that one derived component accounted for 71% of the variance among score totals; the second principal component had an eigenvalue of .53 and accounted for only 5.9% of the variance. Thus, the authors concluded that given their sample, little information would be gained by separating the test scores into nine dimensions of psychopathology and that perhaps the degree but not the precise nature of psychopathology may be measured by the BSI.

An issue critical to the question of construct validation is that of internal structure. To assess the reproducibility of the internal structure of the BSI, the scores of 1002 psychiatric outpatients were subjected to a principal components analysis using a correlation matrix (Derogatis & Melisaratos, 1983). The BSI's developers analyzed a 49 x 49 correlational matrix, omitting the four items that were not hypothesized to have particularly large loadings on any of the nine primary dimensions of the instrument. The results of the analyses, as reported by Derogatis & Melisaratos, were that there are certain minor differences between the empirical factor structure and the dimensional structure rationally hypothesized for the BSI. However, there was apparently more agreement than disagreement between the two, as seven of the nine hypothesized symptom constructs were reproduced with little or no disjuncture of items; the eighth dimension (g) split into two well-defined clinical component dimensions. The ninth dimension (Interpersonal Sensitivity) did not stay together as a linear combination, but it was believed that the set of only four items that define the dimension may be too small to ensure invariance. In all, it was believed that the

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results from the structure-comparing factor analysis lent strong additional weight to the construct validity of the BSI.

Internal structure was examined by Boulet and Boss (1991), also. Their findings revealed that very few dimensions were unambiguously defined by their subscale elements. Of the 49 BSI items, only 29 displayed peak correlations with the appropriate subscale score. On only the DEP dimension did all scale items show the highest correlation with the total scale score for which they were intended. Matters were further complicated when magnitudes of the correlations were taken into account. An item was defined as appropriate for a dimension if it displayed a correlation with the proper dimension that was equal to or greater than .10 of that item's correlation with any of the other eight dimensions. With such criteria as a basis, only seven of the 49 items could be classified as characterizing the assigned dimension.

There is one study which has examined the convergent validity for the BSI Depression dimension using the Hamilton Depression Rating Scale (HDRS; Hamilton, 1967) and the short form of the Beck Depression Inventory, a 13-item subset of the original instrument (Beck & Beck, 1972). The two instruments and the DEP dimension of the BSI were administered to 59 male and 118 female community-dwelling adults, all over the age of 55. The correlation between the BDI short form and the BSI Depression dimension was .71 ($p < .0001$; $n = 145$), and the DEP dimension correlation with the HDRS was .60 ($p < .0001$; $n = 177$). The BDI correlated .68 ($p < .0001$; $n = 146$) with the HDRS. It was concluded, given these findings, that the BDI short form and the BSI Depression dimension were comparable

to the HDRS in their ability to screen for cases of depression in an elderly, community-dwelling sample (Stukenberg, Dura, & Kiecolt-Glaser, 1990).

A study to determine the predictive validity of the BSI was undertaken by a group of researchers in the mid- to late-1980s (Zabora, Smith-Wilson, Fetting, & Enterline, 1990). Thirty newly diagnosed cancer patients were recruited from the New Patient Clinic of the outpatient medical oncology department of a major university in the eastern United States. High distress cancer patients were identified by screening instruments developed through the Omega Project (Weisman, Worden, & Sobel, 1980). The participants were asked to complete the Screening Instrument (SI) and the Inventory of Current Concerns (ICC), two of the Omega Project components, and the BSI during their initial clinic visit. Since nine of the original participants died prior to follow up, the remaining 21 were contacted nine to 12 months later and asked to complete follow-up instruments. Of that group, 19 consented to the request and completed the Profile of Mood States (POMS; McNair & Lorr, 1964) and the Psychosocial Adjustment to Illness Scale-Self Report (PAIS; Derogatis & Spencer, 1984). The overall Omega score was cross-tabulated with the GSI of the BSI utilizing the Kendall rank correlation coefficient (τ) (Siegel, 1956) and was found to equal .624 where $p < .0002$. To further determine the agreement between these instruments, the issue of "caseness" was examined by performing a Kappa analysis (Fleiss, 1981), and the observed agreement between the Omega instruments and the BSI was high at .833. The findings from the Profile of Mood States subscale of the POMS and the findings from the Psychosocial Adjustment to Illness Scale subscale of the PAIS were used to

determine the BSI's ability to identify future cases. A positive case was defined by a positive result on the POMS or the PAIS, and a negative case had to have scored a negative result on both instruments. The Kappa analysis for this determination yielded a score of .650 where $Z = 2.85$ ($p < .01$). Both the BSI and Omega correctly identified 16 of 19 (84.2%) cases. Employing confidence intervals, Zabora et al. determined that 95% of the time the true proportion of correct predictions by the BSI should be greater than 70%.

Looking at the extent to which various response sets might affect scores on the dimensions has been examined by checking the correlations between the BSI subscale scores and the *L*, *F*, and *K* scales of the MMPI (Boulet & Boss, 1991). The findings revealed that the BSI dimensions and the GSI global index correlated significantly with the *F* and *K* scales of the MMPI. This indicated that defensive individuals tended to obtain lower scores on the nine dimensions. Those who were predisposed to exaggerating their psychopathological symptomatology, as measured by the *F* scale of the MMPI, tended to obtain higher scores on a number of BSI dimensions. These findings led to the conclusion that the BSI dimensions are partially reactive to various response sets common to psychiatric patients.

Cautionary findings pertaining to how BSI scores can be interpreted are also found in the literature. Hale and Cochran (1992) utilized data attained from a larger cross-sectional study in which 841 alumni of a small, Southern university participated by completing questionnaires that dealt with health and aging. The sample was divided into four age cohorts of ages 21 to 34, ages 35 to 49, ages 50 to 64, and ages 65

and older. All respondents completed the BSI, and the researchers then used an analysis of variance to compare mean PST (one of the three global indices) scores of men and women in the four age groups. No relationship was found between age and distress for self-reported psychopathology. However, their findings did seem to suggest that young adults are more likely to report distress of a primarily psychological nature, while older adults are more likely to report distress associated with somatic and memory-related concerns.

It appears then that the BSI is a well-developed instrument for the purposes of research, though for clinical concerns, its use may be somewhat questionable. Studies have shown it to be internally consistent and to possess good test-retest reliability. Its alternate forms reliability is good if one accepts the explanation of its developers that the SCL-90-R is truly an alternate form of the BSI. Findings regarding the BSI's convergent validity are mixed with at least some of the dimensions showing good convergent validity while most have only moderate convergent validity. Some researchers have raised questions about the instrument's construct and discriminant validities, while others have shown that there does seem to be some promise of the BSI's ability to predict future distress. Some results have suggested that the BSI may be a better measure of degree of psychopathology as opposed to the precise nature of it, and there seems to be a possibility that the dimensions may be reactive to response sets common to psychiatric patients. Furthermore, researchers using the BSI should be aware that the types of distress actually being reported by participants may vary with age.

Duke-UNC Health Profile (DUHP). The DUHP is a 63-item instrument designed to measure adult health status in the primary care setting. Its developers intended it to be suitable both for research and for day-to-day clinical assessment (Parkerson et al., 1981). The profile is intended to be used for adults aged 18 years or older, is self-administered for those with at least a ninth grade education or otherwise easily interviewer-administered, and can be scored by hand or machine. Completion time is about 10 minutes if self-administered or 20 to 30 minutes if interviewer administered (Duke-UNC Health Profile Project, 1979).

The DUHP measures health status along four dimensions. The first of these, symptom status (26 items), is known to overlap with the other areas, but because of its importance in primary care, it was conceptualized as a separate dimension. The reasoning was that symptoms are often the earliest if not the only manifestation of altered health, and the number and severity of symptoms provide an indicator of general health status. Furthermore, since patients often present with one or more symptoms that influence selection of diagnostic studies and subsequent treatment, knowledge of symptoms is particularly important to the measurement of outcome in the medical care setting. The second dimension, physical function, comprises nine items. This scale measures an individual's perceived capacity to perform tasks rather than requiring a report of actual performance and uses three distinct components to accomplish this task: disability days (confinement to home or bed), ambulation, and use of the upper extremities. Disability days, a traditional measure of a person's response to illness, assesses the number of days during the past week the

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patient/participant had to stay in the house or was confined to bed most of the day because of sickness, injury, or health problems. The ambulation items are conceived on a scale ranging from perceived inability to walk to the bathroom to running the length of a football field to running five miles. The use of upper extremities simply inquires about whether the patient experienced trouble during the day performing such tasks as peeling an apple or combing one's own hair. The third dimension, emotional function (23 items), examines the respondent's level of self-esteem, defined generally as a liking and respect for oneself and the belief in one's ability to get along with people. Self-esteem was chosen by the instrument's developers due to its theoretical underpinnings which posit it as a good indicator of emotional functioning based on the presumed importance of ego strength to emotional well-being. As such, it serves as a measure of self-perceived interpersonal competence believed to be helpful to researchers and providers in assessing the impact of primary care on the patient's emotional health. The final dimension, social function (five items), looks at a person's ability to perform common societal roles and is assessed in four areas: self-care, ability to function in the workplace or at home, interactions with people, and participation in community and social events. The DUHP's developers recognized the potential for self-care to overlap with other health dimensions and acknowledged that some health status instruments associate it with physical function. However, they expressed their belief that "self-care reflects the most basic form of social role performance: a person who is unable to care for himself or herself not only is impaired socially, but also is

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likely to place more demands upon society than the physically impaired person who is still able to perform self-care” (Parkerson et al., 1981, p. 809).

DUHP items are scored using values ranging from 0 to 2 or 0 to 4 depending on the scale length of the particular item. The score is calculated by summing the raw item values within each dimension and dividing by the maximum possible score for that dimension. This produces a score expressed as a proportion ranging from 0.00 to 1.00. Each item receives equal weight in the scoring within its respective health status dimension, so the higher the score, the better the functioning; the lower the score, the poorer the functioning (Parkerson, et al., 1981). A protocol for scoring missing data is thoroughly outlined in the scoring instructions (Duke-UNC Health Profile Project, 1979).

The study group used for the instrument’s development comprised 395 patients of a large primary care, fee-for-service, group practice in Durham, North Carolina. Of the study population, 40% were within a range of ages from 18 to 29 years, 25% within the range of 30 to 39 years, 13% within the range of 40 to 49 years, 15% within the range of 50 to 64 years, and 7% were 65 years of age or older. Twenty-three percent of the group were African American, 77% were Caucasian, 25% were male, and 75% were female. Most of the group had no more than a high school education (56%), and 66% were employed. Sixty-four percent of the group members were married, 17% were single, 12% were listed as separated/divorced, and 7% were widowed. The mean scores on the four dimension for the study group were .84 on symptom status (range = .40 to 1.00), .72 on physical function (range = .06 to 1.00), .77 on emotional function

(range = .22 to 1.00), and .74 on social function (range = .10 to 1.00) (Parkerson et al., 1981).

Using the study group just presented, Parkerson et al. (1981) calculated one or more of three approaches to establish reliability of the DUHP. For the items from the emotional function dimension, both item-remainder analyses and internal criterion analyses (Likert, 1967) were performed. The results from each of these analyses were compared to isolate items which did not measure what other scale items measured (item-remainder analysis) and did not meaningfully discriminate between the two groups of persons who were high or low scorers on the scale (internal criterion analysis). All isolate items were then considered for deletion from the instrument, and all remaining items were subjected to a measure of internal consistency, Cronbach's alpha (Cronbach, 1951). Originally, there were 26 items in the emotional function dimension on which the item-remainder analysis was run. Spearman correlations for the analysis ranged from .17 to .59 with 19 of the items producing correlations of .40 or higher. Internal criterion analysis was then performed, and it revealed mean score differences between upper and lower tertiles ranging from 0.8 to 1.9 (out of a possible 4.0). These results led to three items being dropped from among the emotional function items. Internal consistency for the remaining 23 items on this dimension was .85 as measured by Cronbach's alpha.

Guttman scalogram analysis (Guttman, 1944) was used as a measure of reliability for the ambulation items of the physical function dimension and for the social function dimension, because the two groups of items were developed as

unidimensional constructs with items selected to reflect incremental changes in function. The coefficient of reproducibility (indicates the predictability of a respondent's scale score for the resulting response pattern) and the coefficient of scalability (indicates the extent to which the scale is unidimensional and cumulative) (Edwards, 1957) were both generated in these analyses. For the ambulation items in the physical function dimension, the Guttman scalogram analysis revealed high coefficients for reproducibility (.98) and scalability (.89). Items with substantive overlap with other items or items which lowered scalability were eliminated from the original 15 items leaving nine items in the final physical function dimension. Guttman scalogram analysis for the social function yielded coefficients of .93 for reproducibility and .71 for scalability. This dimension started out with five items, and all five were retained (Parkerson et al., 1981).

Temporal stability was assessed for each of the four health dimensions, but only those patients whose health status was expected to show minimal change from initial to return visit could be used in these particular reliability analyses. Only 10% of the original 395 participants met these inclusion criteria, and almost all of them were women. This necessitated the drawing of a second sample from the Family Medicine Center patient population, and that group consisted of 100 male patients. Of this new sample, 55 participants completed the DUHP upon admission and during return visits that ranged in time from one to eight weeks subsequent to the initial administration. Spearman rank-order correlation coefficients between test and retest scores for the components of the four dimensions ranged from a low (.32) on the digestive symptoms

component of the symptom status dimension to a high of .89 on the ambulation component of the physical function dimension. For the dimensions, the test-retest correlation coefficients were as follows: physical function (.82), emotional function (.72), symptom status (.68), and social function (.52). Sixty of the 63 individual items showed positive test-retest score correlations ranging from .15 to .87 with a median and mean of .54. The three items that lacked positive correlations, fainting, walking to the bathroom, and self-care, were retained with the other items because of their clinical importance (Parkerson et al., 1981). Only one other study can be found that lists any results regarding the reliability of the DUHP subscales. Eighty-four middle-aged and older adults (mean age was 60 years) completed the DUHP along with a battery of other instruments. The study was proposed to test the psychometric properties of the Quality of Life Scale (QOLS; Flanagan, 1978) with a group of participants who suffered from one of four chronic conditions: diabetes mellitus, ostomy secondary to colon cancer or colitis, osteoarthritis, or rheumatoid arthritis. The participants were administered the test battery at Time 1 with retesting at Times 2 and 3. Time 2 followed Time 1 by three weeks, and Time 3 followed Time 2 by three more weeks. The individual test-retest reliability coefficients were not listed for each of the DUHP's four dimensions, but the findings did show the coefficients to range from .53 to .90 (Burckhardt, Woods, Schultz, & Ziebarth, 1989).

Content validity and construct validity were both established for the DUHP, but criterion-related validity was not, since no suitable "gold standard" with which to compare scores existed at the time of the instrument's development. The principal

method used in developing the DUHP was construct validity. Of the original 395 participants, 322 self-administered the DUHP. From the 322 who self-administered, 315 also completed one of three comparison instruments: 103 completed the Sickness Impact Profile (SIP; "Sickness Impact Profile," 1978), 101 completed the Tennessee Self-Concept Scale (Tennessee; Fitts, 1964), and 111 completed the Zung Self-Rating Depression Scale (Zung; Zung, 1965) (Parkerson et al., 1981).

Part of the validity study of the DUHP developers involved the determination of demographic correlations. To do this, predicted and observed associations between DUHP scores and demographic characteristics of participants were compared. Using a modified Delphi approach requiring three rounds to reach consensus (Millholland, Wheeler, & Heiek, 1973), the researchers hypothesized the expected strength and direction of the associations on a scale of -4 to $+4$. Spearman correlations were then used for the analysis of observed associations. As was expected, the younger the participant, the higher the health status score. The highest such correlation was on the physical function dimension (.49), followed by symptom status (.20). Weaker correlations for age and social function (.14) and emotional function (.11) were found. Little difference between male and female with respect to emotional and social function was observed. Males reported slightly higher physical function and fewer symptoms. Virtually no effects were produced in regards to race and marital status. Socioeconomic status (SES), education, and occupational status all related with DUHP scores so as to suggest that participants in the higher status groups had higher physical function scores than those in the lower status and marginally higher scores on symptom

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status and social function. Emotional function was not related to SES, education, or occupation. The predicted and observed relationships between DUHP mean scores and demographic characteristics of patients yielded an overall Spearman correlation of .79 ($p < .0001$) (Parkerson et al., 1981).

As for the calculations performed regarding correlations among the four dimensions of the DUHP, symptom status was highly correlated with the other three dimension scores (.45 with physical function, .30 with emotional function, and .36 with social function), while emotional status tended to have the lowest overall correlations with the scores of the other three dimensions (.30 with symptom status, .17 with physical function, and .27 with social function) (Parkerson et al., 1981).

As was expected, the four DUHP dimensions correlated reasonably well with the SIP scores from a low of .31 on the social function dimension to a high of .66 on the symptom status dimension using Spearman rank-order correlation coefficients ($p < .05$ for all correlations). A high correlation between the Tennessee total score and the DUHP emotional function score was expected and was produced (.89, $p < .05$). The reason such a correlation was expected was because both are measures of self-esteem. The Zung measures somatic and psychological components of depression which are, in part, reflected by patients' symptoms; thus were yielded the high correlations with the DUHP's symptom status dimension score (.61) and the emotional status dimension score (.57) (Parkerson et al., 1981).

Comparisons among correlations were also analyzed for convergent and discriminant validity. The monocomponent-heteromethod was used to determine

convergent validity and produced correlations between the respective components of the DUHP and the SIP which ranged between .34 and .45 ($p < .05$). Given all these correlations were well above zero and in the same expected positive direction supports convergent validity. With few exceptions, these correlations were higher than others in the same row and column of the square heterocomponent-heteromethod section of the matrix. This is an indication that the measurement effect of the respective components by the two instruments exceeded that expected from random variation alone. This supports discriminant validity. Further evidence for discriminant validity was shown in that the monocomponent-heteromethod correlations were higher than the heterocomponent-monomethod correlations for a given method. This indicated that the effect of the method exceeded instrument variance. Thus, discriminant validity was at a high level for the DUHP (Parkerson et al., 1981).

As has been shown, the DUHP is an instrument for which good internal consistency has been demonstrated. The test-retest reliability for the instrument's four dimensions was moderate to good. Construct validity in terms of predicted versus observed relationships between DUHP scores and patient characteristics was supported for all four health dimensions. Convergent and discriminant validity was supported for all portions of the emotional and social function dimensions, all but two items of physical function, and half of the symptom status items. The researchers explained that unvalidated portions were primarily those for which few positive responses were elicited in their relatively healthy study group, or for which comparable items were not available from other instruments (see Parkerson et al., 1981).

Personal Information Questionnaire (PIQ). The PIQ is a form designed for the purpose of gathering pertinent sociodemographic information on the participants of this study. The form was put together by the primary researcher and asks participants to answer basic questions pertaining to themselves about their age, date of birth, gender, race, marital status, occupation, years of education completed, employment status, and income. In addition, a few questions have been included which attempt to tap information regarding the “ruralness” of the participant. The first page of the PIQ comprises a section for the written instructions and blanks to be used by participants to supply their name, address, telephone number, and to give permission to be contacted for additional information. The name, address, and telephone number are all optional as indicated just below the instructions. It is explained in the instructions that if the participant chooses to supply any identifying information, the upper half of the first page which includes such information will be detached and stored in a locked file. It is also made clear in the instructions that the purpose of the identifying information is for contacting participants on future dates should more information be needed and that once all needed information is collected, all identifying information will be destroyed. The PIQ is expected to take less than five minutes to complete and should be easily read by anyone with a ninth-grade education.

Procedures

All data will be gathered at one primary care private practice in a rural area of western Oklahoma. The owner of the primary care practice estimated that each of his patients waits an average of 45 minutes from the time they enter his office until the

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time they get in to see him or his associates, and 45 minutes is believed to be ample time for patients to complete the entire battery. He has agreed to have his receptionist ask his patients as they sign in if they would be willing to participate in a study designed to potentially improve the overall services offered to the patients of the facility. Furthermore, the doctor has also agreed to provide a private room for the purposes of explaining the study, reading and signing the informed consent form, and administering the instruments to be used.

Those who agree to participate will be taken to the room reserved for the study where they will receive an explanation of the study using a standard statement. Once the patient has been read the statement, the receptionist will make sure the informed consent form is understood and properly signed by each participant. In addition, the reading ability of each participant will be informally assessed prior to the administration of the instruments to ascertain if that ability is sufficient to allow thorough understanding of all questions to be read. Those who demonstrate adequate reading ability will be given the battery to complete, but each battery will be counter balanced to account for ordering effects. In other words, the order in which the instruments are administered will vary; the order of instruments in any one packet will be identical to the order of instruments in the packet presented to the fifth subsequent participant. Once a participant has completed all forms, the receptionist will gather the forms, check everything to assure that all questions were answered, and then place the battery and corresponding consent form in an envelope and seal it in front of the patient. Then, each participant will be asked to indicate where they live by writing

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their individual identification number in the area where their residence is located on one of two maps which will be attached to a wall in the clinic. One of the maps will be of the county in which the primary care facility is located and will be used for those participants who live outside the city limits. The other map will be of the town in which the primary care facility is located and will be used for those participants who live within the city limits. The area upon which the maps will be hung will be located in an area of the facility that cannot be readily viewed by patients of the facility. Once all the data gathering process is complete, all forms and the maps will be picked up by the primary investigator for scoring and analysis.

The owner of the primary care practice has also agreed to either have his receptionist supply the information or to allow research assistants access to computer data and/or chart data pertinent to attaining answers to all of the factors that comprise utilization of primary care services. The model for utilization of services in this study was adapted from two previous studies which have examined utilization patterns of medical care patients (see Ellenweig & Pagliccia, 1994; Lin et al., 1991). The utilization variables used in this study include primary care visits, specialty visits, emergency visits, phone calls, diagnostic tests, requests for specialty referral, laboratory tests, specialist consultation, and doctor home visits. The total number of occurrences of each variable during the past year will be added together to determine the utilization of primary care factor. In addition, the diagnosis of each participant will be included. All of this information will also be placed in an envelope which will be sealed and returned to the primary investigator for analysis.

Data Analysis

A variety of statistical procedures will be used to analyze the data for this study. The first, second, and third research questions are descriptive in nature. Thus, a descriptive statistic such as the mean, median, or mode for the most common stressors, psychological problems, and general health problems should provide the needed information.

The fourth and fifth research questions both seek information about the relationship between an independent variable common to each question and a dependent variable that is unique to each. For each of these questions, a stepwise regression will be used.

The sixth research question is meant to determine which of the four assessment instruments is most predictive of utilization of primary care services. This will be answered by means of a multiple regression.

The seventh and eighth research questions are concerned with the relationship between the scores of the rural sample on two of the instruments and the normative sample scores on the same two instruments. Thus, the Pearson correlation coefficient will be determined for each of these relationships.

All hypotheses state that there is some relationship, negative or positive, between a dependent variable and an independent variable. It is believed that all of the hypothesized relationships can best be answered by determining the Pearson correlation coefficient for each. For those hypotheses using utilization of primary care

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services as the independent variable, the number will be transformed using the square root of the number for the comparison if the distribution of the totals is so skewed that it would violate the assumption of normality necessary to accurately determining the Pearson coefficient. It is believed that such a transformation would help offset the violations to the assumption by yielding a more normal distribution.

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