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The role of initial coping strategies on subsequent appointment attendance in individuals with HIV: a longitudinal analysis

DeAnn Morris Johnson

Louisiana State University and Agricultural and Mechanical College

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THE ROLE OF INITIAL COPING STRATEGIES ON SUBSEQUENT
APPOINTMENT ATTENDANCE IN INDIVIDUALS WITH HIV:
A LONGITUDINAL ANALYSIS

A Dissertation

Submitted to the Graduate Faculty of the
Louisiana State University and
Agricultural and Mechanical College
in partial fulfillment of the
requirements for the degree of
Doctor of Philosophy
in

The Department of Psychology

by
DeAnn Morris Johnson
B.A. Southeastern Louisiana University, 1995
M.A. Southeastern Louisiana University, 1997
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Abstract

With advances in HIV treatment regimens, HIV has become a treatable chronic illness that requires extensive clinical management (Kelly, Otto-Salaj, Sikkema, Pinkerton, & Bloom, 1998). Nonadherence to HIV medical regimens is a primary reason for treatment failure. HIV medication regimens are complicated and require extensive time and effort from the patient (Friedland & Williams, 1999). Since the effectiveness of HIV medication regimens can be severely limited by poor adherence, much research has been conducted regarding the influence of psychosocial factors in adherence. However, this research has primarily focused on medication adherence and has not investigated psychosocial aspects associated with other adherence related behaviors such as appointment attendance. Thus, the current literature may be missing an entire group of HIV patients who do not follow through with medical care long enough to receive medications or other available treatments and services.

The primary purpose of this study was to evaluate the effects of initial coping strategies on long-term appointment attendance in individuals with HIV. Baseline data collection was conducted between 1992 and 1995 and included information concerning demographic factors, illness severity, depressive symptoms, and coping strategies. The current results were obtained by a retrospective chart review of appointment attendance. It was predicted that problem-focused coping would be associated with attending regularly scheduled clinic visits and emotion-focused coping would be predictive of failure to attend appointments. Multiple regression analysis revealed that the coping style employed by participants did not predict appointment attendance above and beyond the variance predicted by demographic, illness, and distress related factors. However, minority status, depressive symptoms, and history of intravenous drug use did emerge as reliable predictors of failure to attend scheduled clinic appointments over a three-year follow-up period. These results suggest that increased depressive symptoms, a history of

intravenous drug use, and being African American negatively impact treatment success by reducing appointment attendance. Further research should evaluate the specific variables associated with poor appointment attendance among minority individuals.

Introduction

The Human Immunodeficiency Virus (HIV), which leads to Acquired Immunodeficiency Syndrome (AIDS), has become a worldwide health threat. HIV disease strikes the immune system and slowly degrades the body's ability to ward off infections and other illnesses. Approximately 47 million people have been infected with HIV worldwide (Fan, Connor, & Villarreal, 2000). Currently, there are about 400,000 people living with HIV or AIDS in the United States (Center for Disease Control and Prevention [CDC], 1999). Although AIDS-related deaths are declining, the number of people living with HIV or AIDS continues to increase. Between 1997 and 1998, there was a ten percent rise in the number of new HIV infections (CDC, 1999). According to the CDC (1999), minorities are disproportionately represented in this population. Minorities, particularly African Americans, account for 80% of the women and 61% of the men with HIV. This trend appears to be continuing and emphasizes the importance of research aimed at effective psychosocial treatments of this rapidly growing population.

HIV is most commonly transmitted through sexual contact and sharing of contaminated needles. Intravenous drug use is the second highest risk factor for contracting HIV infection (CDC, 1999; Chitwood, et al., 2000). However, non-intravenous substance use such as crack cocaine and alcohol also increase the risk of engaging in unsafe sexual behaviors that may increase exposure to HIV (Stall, McKusick, Wiley, Coates, & Ostrow, 1986). HIV can also be transmitted from mother to child during pregnancy, birth, or lactation. Although quite rare, HIV can be transmitted to healthcare workers through accidental needle sticks.

HIV belongs to a class of viruses called retroviruses. Retroviruses encode their genetic information in RNA rather than DNA and have a complex life cycle. Retroviruses consist of three main components including a group of core particle proteins, the enzyme reverse

transcriptase, and a protein coat. Reverse transcriptase allows the virus to replicate and the protein coat helps the virus bind with other cellular receptors (Fan, et al., 2000). During the initial infection process, the genetic RNA core of the retrovirus binds with the receptors of uninfected cells and invades the host cells. Next, reverse transcriptase converts RNA into viral DNA and is integrated into the cellular machinery. This allows the infected cell, or virion, to continue functioning normally and the virus to replicate rapidly (Fauci, 1988).

The principle target cell of HIV is T lymphocytes, or T-cells. T-cells contain CD4 protein receptor sites which assist other immune system cells in eliminating foreign particles or pathogens from the body. HIV binds with these CD4 receptors, thus killing T-cells. As T-cells are destroyed, immune system functioning declines and infectious agents are not eliminated from the body. Consequently, illnesses or infections that would rarely survive in the body of a healthy individual to develop, proliferate, and ultimately lead to the death the infected individual.

The CDC has defined four primary stages of HIV infection. The progression of these stages varies across individuals. The first phase is an acute HIV syndrome that is sometimes called seroconversion illness. Individuals may experience vague flu-like symptoms including fever, fatigue, rash and enlarged lymph nodes. Because these symptoms are nonspecific, people rarely seek medical attention at this point. The second stage is commonly referred to as the silent phase and includes a prolonged asymptomatic period that usually lasts between five and ten years. During the silent stage there is a progressive build-up of the virus in the body (particularly in the lymph nodes, spleen, and liver) with a concurrent drop in T-cells. The third stage of HIV infection, the symptomatic phase, is characterized by the presence of noticeable symptoms. These symptoms include enlarged lymph nodes in the head and neck region, persistent low-grade fever, night sweats, chronic diarrhea, peripheral neuropathy, and oral ulcers. On average, the

symptomatic phase lasts approximately three years until an AIDS diagnosis is made. The fourth stage, AIDS, is marked by the presence of opportunistic infections or cancers (e.g., Kaposi's sarcoma) and a T-cell count below 200 cells per cubic millimeter. Without intervention, opportunistic infections and other illnesses eventually lead to death. However, recent advances in treatment have dramatically lengthened the symptomatic phase and delayed the onset of AIDS and eventual death (Kelly, Ott-Salaj, Sikkema, Pinkerton, & Bloom, 1998).

Initially, treatment of HIV/AIDS was limited to the clinical management of the opportunistic infections that result from HIV infection (Kelly et al., 1998). In the mid 1980's drugs called nucleoside analogues, such as zidovudine (AZT), were introduced as the first successful treatment for HIV infection. AZT and other similar drugs (e.g. didanosine, lamivudine) limit the ability of HIV to produce DNA and thereby decreased the rate of HIV cell replication (Fan et al., 2000). Although individuals who received these medications experienced some side effects (headache, nausea, insomnia) they also had fewer opportunistic infections, increased T- cell counts, and improved survival rates when compared to untreated individuals at a similar stage of illness (Volberding, et al., 1994).

Between late 1995 and early 1997 a new class of antiretroviral medications called protease inhibitors was introduced. These drugs prevent the production of HIV by directly inhibiting the enzyme (protease) responsible for viral maturation, thus slowing the replication of HIV. Treatment regimens that combine protease inhibitors with at least two other nucleoside analogues (i.e., combination therapy) have been associated with increased T-cell counts, decreased levels of HIV circulating in the blood (i.e., viral load), improved health outcomes, and life extension (Deeks, Smith, Holodniy, & Kahn, 1997; Nelson, 1996). As with the initial treatments for HIV, the benefits of combination therapy are often limited by side effects. Many

side effects including fatigue, insomnia, diarrhea, gastro-intestinal discomfort, nausea, and vomiting are transient and tend to subside within one to two months (Lin-in Tseng, 1998). However, other side effects such as oral numbness and peripheral neuropathy are more long lasting and often require medical intervention (Lin-in Tseng, 1998). The success of combination therapy has also been limited by the complicated nature of the medication regimens. These regimens require significant time and effort from patients in order to be successful (Carpenter et al, 2000).

HIV medications must be taken on a demanding schedule and require frequent physician visits to monitor the patient's progress and prevent complications. Individuals who are less adherent with their treatment regimens do not fully benefit from treatment and experience more opportunistic infections (Montaner et al., 1998; Friedland & Williams, 1999). Although adherence has been an important factor in chronic illness research in the past, complex HIV treatments have generated resurgence in this research

Adherence

The importance of adherence in medical regimens is not a new concept. About 25 years ago researchers began to investigate the factors associated with carrying out medical instructions (Haynes, 1976). Haynes defined medical compliance as the "extent to which a person's behavior coincides with medical or health advice" (Haynes, 1976). Presently, the term, compliance, has fallen out of favor and has been replaced with the term adherence. Instead of portraying the person as a passive recipient who complies with medical advice, the term adherence denotes the collaborative, interactional nature of the relationship between individuals and medical professionals (Turk, Salovey, & Litt, 1986). This definition of adherence

encompasses a broad array of behaviors including medication intake, appointment attendance and other health related behaviors.

Adherence in Chronic Illness

Adherence to medical regimens has been studied in a variety of chronic medical conditions including diabetes, coronary artery disease, and tuberculosis (Epstein, 1984; Friedland & Williams, 1999; Horowitz et al., 1990; O'Brien, Petrie, & Raeburn, 1992). Adherence rates among patients with chronic illnesses are surprisingly low and even under ideal conditions rarely reach 100 percent. It has been estimated that 30% to 60% of patients do not take medications as prescribed (Augenbraum, et al., 1998; Cramer, Mattson, Prevey, Scheyer, & Oulette, 1989; Dunbar-Jacobs, Dwyer, & Dunning, 1991). Adherence rates are also low when other health related behaviors are considered. For example, Gerber (1986) reported that medical appointments are missed as much as half of the time.

Research has not identified a single variable or group of variables that can reliably predict who will be adherent with treatment regimens; however, many variables have been linked to adherence. In general, patient characteristics such as age, gender, ethnicity, and educational levels have not been shown to be good predictors of adherence, (Besch, 1995; Griffith, 1990; Meichenbaum & Turk, 1987). However, the most reliable adherence occurs when the illness in question is short term, and produces obvious disease symptoms (O'Brien, et al., 1992). Consequently, decreased medication adherence has been associated with complex and long-lasting medical regimens that include multiple medications and frequent drug administration, such as HIV treatments (Griffith, 1990).

Adherence in Persons with HIV

Research has documented substantial rates of non-adherence with HIV medication regimens, even during brief periods of time. Early studies of monotherapy estimated that successful adherence (taking at least 80% of prescribed doses) only occurred approximately 42% of the time when monitored over the previous month (Singh et al, 1996) and 67% of the time when monitored over the previous week (Samet et al., 1992). Similar results have been noted in studies of adherence to combination regimens. Hecht, Colfax, Swanson, & Chesney (1998) found that outpatients at an AIDS clinic in San Francisco reported missing 20 percent or more of their HIV medications over a short three-day period. This is consistent with other results regarding combination therapy including a study by Catz and colleagues that found that one third of patients reported missing medication doses within the past five days (Catz, Kelly, Bogart, Benotsch, & McAuliffe, 2000). Because poor treatment adherence represents a major problem facing individuals with HIV and substantially impacts the effectiveness of their treatment, much research has been conducted to investigate the factors associated with HIV treatment adherence. These variables can be divided into two main categories: HIV treatment characteristics and individual characteristics.

HIV Treatment Characteristics

In general, research has shown that medical regimens are more likely to be followed when the disease is brief, treatment regimens are simple, and the medication removes salient symptoms (Agras, 1989; Blackwell, 1992; Nannis, Temoshock, Smith, & Jenkins, 1993). Additionally, complicated treatment regimens that involve large numbers of medications with difficult dosing requirements and troublesome side effects have been associated with nonadherence (Dunbar-Jacobs, et al., 1991). Because HIV infection is a chronic illness that does

not always produce overt symptoms and involves a complex and demanding course of treatment, the HIV medication regimens that are currently available have not proven to be representative of the ideal conditions to promote adherence (Friedland & Williams, 1999).

Individual Characteristics

HIV medication adherence is best when the individual is educated about the treatment (Eldred, Wu, Chaisson, & Moore, 1998; Stall et al., 1996), believes the treatment is needed (Blumenfield, Milazzo, & Wormser, 1990), has support from family and friends, (Mostashari, Riley, Selwyn, & Altice, 1998; Singh, et al., 1999; Stall et al, 1996), and is convinced of treatment efficacy (Catt, Stygall, & Catalan, 1995; Muma, Ross, Parcel, & Pollard, 1995).

As with other illnesses, initial research showed that demographic variables such as age, gender, and education level were not good predictors of adherence to HIV medication treatments (Muma et al., 1995; Singh, et al., 1996). However, many of these studies included samples that consisted of primarily Caucasian homosexual males. Other studies, that have included broad samples more representative of the entire population of individuals with HIV, have shown demographic factors, particularly ethnicity, are predictive of decreased adherence (Eldred, et al., 1998; Singh, et al. 1996; Singh et. al, 1999). For example, Singh and colleagues (1999) found that 31% of Caucasians were adherent with medication regimens, but only 12% of minority participants (predominately African-American) followed their medication regimens.

Demographic differences are even stronger when the definition of adherence is broadened to include variables such as appointment attendance (Catz, McClure, Jones, & Brantley, 1999; Israelski, Gore-Felton, Power, Wood, & Koopman, 2001; Kissinger, 1995; McClure, Catz, & Brantley, 1999). Given the current increased incidence of HIV among the minority population,

understanding these ethnic differences and related psychosocial factors is especially important (CDC, 1999; CDC, 2000).

Other individual variables have been found to negatively impact adherence. Psychological difficulties have been associated with decreased appointment attendance, particularly when depressive symptoms or substance use is involved (Catz et al., 1999; O'Connor, Selwyn, Schottenfeld, 1994). Each of these factors will be reviewed briefly below. Depressive Symptoms: Individuals with HIV may be at a greater risk for experiencing depressive symptoms due to the stressors associated with living with a fatal and stigmatizing illness. Depression is a common problem among individuals with HIV. It is estimated that 20% of individuals with HIV/AIDS experience depression (Heckman, Kochman, Sikkema, & Kalichman, 1999). Depression can seriously impact patients overall well-being and adherence to their medical regimens.

Studies have shown that HIV patients who experience increased depressive symptoms demonstrate poor adherence, report more pain, have lower T-cell counts (i.e., indicating greater illness), and increased substance use compared to HIV patients with average levels of depressive symptoms (Blumenfield, et al., 1990, Bogart, et al., 2000, Catz, et al., 2000; Kalichman, Ramachandran, & Catz, 1999; Rabkin, & Ferrando, 1997; van Servellen, Sarna, Padilla, & Brecht, 1996.; Vassend & Eskild, 1998). Furthermore, depression has been linked to poor health outcomes in individuals with HIV including increased progression of HIV to AIDS and increased mortality (Ironson et al., 1994; Leserman, et. al, 2000; Mayne, Vittinghoff, Chesney, Barrett, & Coates, 1996; Page-Schafer, Delorenze, Satariano, & Winkelstein, 1996).

Substance Abuse: A large number of individuals with HIV who have a history of substance use may continue using illicit drugs while receiving treatment for HIV. Substance abuse may lead to

problems with treatment adherence and ultimately treatment failure. Substance use has been linked to poor adherence and may lead to increased viral progression (Dickinson, 1998; Haubrich, et al., 1999; O'Connor et al, 1994; Samet et al., 1992). Eldred and his colleagues (1998) found that HIV patients cited problems associated with the use of drugs and alcohol as the third most common reason for missing HIV medications. Substance use is also important in adherence behaviors not directly related to medication intake. For example, substance use has been consistently identified as a primary risk factor in missed clinic appointments (Kissinger, et al., 1995; McClure, et al., 1999). Consequently, many individuals who have a history of substance use may be at risk for dropping out of treatment entirely. Little research exists that help explain the role of substance abuse in adjustment to HIV treatment demands.

Coping strategies have been shown to be useful in helping individuals manage the psychosocial stressors associated with HIV (Chesney, Folkman, & Chambers, 1996; Siegel, Gluhoski & Karus, 1997). The strategies individuals use to cope with HIV treatment are an important mental health issue because these strategies ultimately influence treatment success (Kelly et al, 1998). Recent studies have also shown that the coping strategies individuals use to adjust to HIV, may impact their participation in treatment.

Coping

Coping involves cognitive and behavioral efforts to manage problems caused by stressful situations. Lazarus and Folkman (1984) defined coping as a dynamic process based on an individual's appraisal of the extent to which the stressor outweighs their psychological resources. Coping includes adaptive efforts to manage the external or environmental aspects of a stressor, and avoidant behaviors to minimize exposure to the stressful situation (Lazarus, 1993). Coping strategies can be divided into two broad categories: problem-focused coping and emotion-

focused coping (Bombardier, D'Amico, & Jordan, 1990). Problem-focused coping is aimed at managing the external or environmental aspects of a stressor. In contrast, emotion-focused coping is aimed at regulating the affective consequences of a stressor. Examples of problem-focused coping in HIV include becoming active in one's medical regimen such as seeking out information about HIV, and making healthy lifestyle changes. Examples of emotion-focused coping include avoidance and distraction including refusing to discuss HIV and attempting to forget about being HIV positive by not attending medical appointments (Kalichman, 1998). Reliance on emotion-focused coping strategies has generally been associated with poor adaptation to stressors (Moos & Schafer, 1993).

Studies have shown that individuals with HIV who utilized problem-focused coping experience less psychological distress than those patients who utilized emotion-focused strategies such as avoidance (Namir, Wolcut, Fawzy, & Alumbaugh, 1987; Nicholson & Long, 1990; Siegel, et al., 1997; Wolf, et al., 1991). For example, Namir and her colleagues (1987) found that increased depression was associated with emotion focused coping in a group of men living with HIV/AIDS. Emotion focused coping has not only been associated with depression, but also with increased disease progression. While, increased utilization of active coping strategies has been associated with reduced severity of HIV symptoms (Mulder, Antoni, Duivenvoorden, Kauffmann, & Goodkin, 1995; Solano, et al., 1993). Problem-focused coping strategies have also been related to increased quality of life ratings and improved medical outcomes, including increased CD4 counts, for individuals with HIV (Friedland, Renwick, & McColl, 1996; Goodkin, et al., 1992).

Many studies have noted ethnic differences in coping and psychosocial adjustment. In general, minorities tend to utilize emotion focused coping strategies rather than problem-focused

coping strategies (Plummer & Slane, 1996; Slavin, Rainer, McCreary & Gowda, 1991). These results have also been confirmed in medical populations (Rodrigue, 1997). However, there are mixed results concerning the role of ethnicity on coping strategies and subsequent adjustment to living with HIV (Heckman, et al., 1999; Lesserman, Perkins, and Evans, 1992; Singh et al., 1999).

Lesserman and colleagues (1992) found that African American men with HIV expressed increased depressive symptoms and utilized more emotion focused coping strategies. These results were confirmed in a larger multi-site study (Singh, et al., 1999). However, Heckman and colleagues (1999) came to the opposite conclusion, finding that a group of African American men demonstrated increased problem-focused coping and decreased depression. The mixed results concerning coping style and subsequent psychological distress among ethnic minorities may have been caused by the use of restricted samples. The above-mentioned research was conducted with homosexual male participants and may not be representative of other individuals with HIV. Since rates of new HIV infections are rising fastest in the African-American population and this population is confronted with many economic and cultural issues that complicate their adjustment to HIV, identification of potential variations in coping style is necessary. Furthermore, the impact these coping strategies have on adherence may lead to the development of behavioral interventions (e.g., coping skills training) that would be helpful in improving overall quality of life for minority individuals (CDC, 1999).

The Impact of Coping on Adherence

The strategies individuals use to adjust to the stressors associated with living with HIV disease may significantly impact whether these individuals fully participate in treatment. However, few studies have investigated the role of coping in adherence to HIV treatment. Singh

and colleagues found that individuals, who reported increased utilization of problem-focused coping demonstrated increased adherence to HIV medications when compared to individuals who utilized emotion-focused coping (Singh et al., 1996; Singh, et al., 1999). Other studies have also noted the importance of problem-focused coping (e.g. educating oneself about the disease and its treatment) in successful adherence to HIV medication regimens (Freeman, Rodriguez, & French, 1996; Kissinger, et al., 1995). Although coping appears to impact medication adherence, there is little information available about the role of coping strategies in other behavioral aspects of adherence, such as appointment attendance.

Limitations in the Current Adherence Literature

Most of the information we have concerning adherence to HIV treatment regimens is limited to medication intake, and may be neglecting many other important aspects of adherence. There are numerous behaviors associated with adherence including appointment attendance. Relatively few studies have examined these behavioral aspects of adherence to HIV treatment regimens. This is unfortunate as these behaviors are necessary to ensure successful treatment. In order to reduce drug resistance to the current medication regimens, the current HIV treatment guidelines dictate that patients not be placed on medication until they demonstrate significant progression of HIV related symptoms. Thus, it is even more important that patients attend clinic visits for monitoring. Patients must also attend medical appointments in order to receive any medical advice or prescriptions. Once patients have started HIV medication regimens, frequent physician and nurse visits are required to ensure the medications are being taken as prescribed, gauge the success of the treatment regimen, and to prevent complications. Consequently, non-attendance to medical appointments can seriously interfere with treatment success.

Recent evidence has demonstrated the importance of not limiting the scope of adherence to medication intake, thus neglecting other important aspects of adherence. Lucas, Chaisson, & Moore (1999) identified missed appointments as the primary risk factor to HIV treatment failure at a large inner city HIV clinic. Other studies have shown that variables that are not traditionally important in medication adherence may be important in appointment attendance. For example, Kissinger (1995) found that patients who were most likely to miss appointments were African American, and had a history of IV drug use. Other studies have found similar results with minority status and drug use history emerging as reliable predictors of appointment non-attendance (Catz, et al., 1999; Israelaski, et. al., 2001; McClure, et al., 1999). Israelaski (2001) and colleagues found that appointment non-attendance was highly associated with heterosexual African Americans. This study included only demographic variables and accounted for 13% of the variance in appointment attendance. This suggests that variables other than demographic characteristics may also be involved in missing clinic appointments (Catz et al., 1999; McClure et al., 1999). The current study evaluated the impact of demographic variables, distress related factors, and coping style on appointment attendance.

Summary

Advances in HIV treatment regimens have dramatically changed the long-term prognosis for people diagnosed with HIV. When combination therapies were introduced, overall mortality and new AIDS cases declined for the first time since the beginning of the HIV/AIDS epidemic (CDC, 1999). Thus with new treatments, HIV has become a treatable chronic illness that requires extensive clinical management (Kelly et al., 1998). These medical regimens require significant time and effort from patients including frequent physician contact to monitor the course of the disease, determine appropriate treatments, and ensure the success of these

treatments. As with other chronic illnesses, many individuals have difficulty following medical recommendations and fail to attend medical appointments on a regular basis (Hecht, et al., 1998, Kissinger, 1995, Lucas et al., 1999). Much of the current literature on HIV adherence involves medication adherence and may be missing an entire group of HIV patients who do not follow through with medical care long enough to receive medications or other available treatments and services. Consequently, investigating factors that might be indicative of future likelihood of returning to treatment and can be easily obtained during initial contact with each patient is necessary.

Given the importance of attending medical appointments in successful clinical management of HIV, the present study attempted to identify important psychosocial and illness-related variables that would reliably predict appointment attendance. The primary purpose of the study was to determine if coping styles used by individuals with HIV would predict whether patients reliably attended scheduled medical appointments on a long-term basis. Demographic factors (ethnicity, age, education, sexual orientation), illness severity (T-cell counts, symptom counts), and coping style (emotion-focused vs. problem-focused) were explored among a group of outpatients at an outpatient HIV medical clinic. Specifically, the study addressed the following hypotheses:

Hypothesis 1) It was hypothesized that coping style (problem-focused vs. emotion-focused) would predict appointment attendance above and beyond the variance predicted by demographic (ethnicity, age, gender, sexual orientation, education), illness related (symptom counts, T-cell counts), and distress related factors (depression, substance abuse). Problem-focused coping is characterized by actively managing aspects of a stressor, such as participating in one's treatment regimen; whereas, emotion-focused coping is characterized by emotional

responses including avoidance and re-appraisal of the stressor (Kalichman, 1998). Problem-focused coping has been consistently associated with improved adjustment to HIV related stressors, improved medical outcomes in HIV, and improved adherence to HIV medication regimens. Consequently, problem-focused coping was expected to be predictive of reliable appointment attendance (Friedland et al., 1996, Goodkin et al., 1992; Siegel, et. al, 1997; Wolf et. al, 1991). On the other hand, emotion-focused coping has been associated with increased psychological distress, complicated adjustment to HIV, and increased disease progression (Mulder et al., 1995, Soiano et al., 1993). Thus, emotion-focused coping was expected to be predictive of nonattendance to clinic appointments.

Hypothesis 2) It was hypothesized that demographic factors, particularly ethnicity, would impact coping style. Specifically, minority individuals were expected to utilize more emotion-focused coping strategies, while their Caucasian counterparts were expected to utilize more problem-focused coping strategies. In general, the literature concerning ethnic differences in coping has shown that minority individuals demonstrate increased use of emotion-focused coping strategies (Plummer & Slane, 1996; Rodrigue, 1997; Slavin, Rainer, McCreary & Gowda, 1991). However, this finding has not been consistent in adjustment to HIV related stressors (Heckman, et al., 1999; Lesserman, et. al, 1992; Singh et al., 1999). The majority of this research has been conducted with restricted samples that consisted of male research participants. The sample of participants in the current study was more balanced and provided a good opportunity to evaluate the effects of ethnicity on coping with HIV related stressors. Since emotion-focused coping has been associated with increased distress (Namir et al., 1987; Nicholson & Long, 1990; Siegel et al, 1997, Wolf, et al., 1991) minority participants were also expected to report increased depressive symptoms.

Hypothesis 3) It was hypothesized that participants with a history of substance abuse would utilize emotion-focused coping strategies more than problem focused coping strategies. Specifically, it was expected that participants with a history of substance abuse would utilize significantly more avoidant coping than participants who had no history of substance abuse. In other populations, increased use of avoidant coping has been noted in individuals with a history of substance use (Avants, Warburton, & Margolin, 2000; Belding, Iguchi, & Lamb, Lakin, & Terry, 1996), but relatively little research exists about the relationship between coping strategy and history of substance use in individuals with HIV.

Methods

Participants

Volunteers were recruited during their medical appointments at an ambulatory care HIV clinic (Early Intervention Clinic) located at Earl K. Long Medical Center (EKL). This public teaching hospital in Baton Rouge, Louisiana is part of the Louisiana State University Medical School Campus and serves primarily low SES and uninsured individuals. EKL Patients rarely utilize HIV services outside of this clinic. Volunteers were eligible to participate in the study if they were able to read and were at least 18 years of age. One hundred and sixty patients completed initial baseline evaluation. Outpatient appointment attendance was obtained for a period of three years following completion of the baseline evaluation for each of these individuals. The participants were predominately low income (mean yearly income= <\$10,000 per year) minority (African American= 65%), males (60.6%). The mean age was 32 (SD= 7.9) years and mean education level was 12 years (SD=2.3). Thirty five percent of the sample endorsed intravenous drug use. Approximately 64% of the sample was heterosexual, while 36% were homosexual. The homosexual participants were predominately male as only one female identified as homosexual. Only 12.5 % of the minority participants identified as homosexual. Twenty-eight percent of participants were “asymptomatic” (T-cell count >500); 41% were “symptomatic” (T-cell count 200-500); and 24% were diagnosed with AIDS (T-cell count < 200).

Measures

Demographics Questionnaire

A questionnaire concerning demographics and other information important to the population was administered (See Appendix A). The form includes questions concerning age, gender, race,

education level, marital status, drug and alcohol use, and sexual preference. This information was also obtained by a review of the patient's medical record.

Appointment Adherence

Appointment adherence data were obtained by conducting a retrospective chart review of each patient's Early Intervention Clinic medical record(s). Written records of each scheduled nurse or physician visit at were located and recorded. Each scheduled clinic visit was documented as to whether the patient attended, canceled, or missed (i.e., missing the appointment without canceling or rescheduling, "no shows") the appointment. This information was then used to calculate the total percentage of appointments attended during the three-year period. The following formula was used:

$$\frac{\text{Appointments Attended}}{\text{Appointments Attended} + \text{Appointments No-showed or Canceled}}$$

Frequency of appointments scheduled may vary over time due to factors such as the patient's health status, the patient relocating, or the physicians scheduling availability. Consequently, the percentage of appointments attended was used rather than frequency of appointment attendance. When patients are in good health, appointments may only be scheduled every three to six months. In order to allow the number of scheduled appointments to stabilize and to investigate the long-term impact of initial coping strategies, attendance data were collected for a total period of three years.

Ways of Coping Questionnaire Adapted for HIV

The Ways of Coping Questionnaire (WCQ) is a 66-item scale designed to measure cognitive and behavioral coping strategies people use to manage their reactions to stressful events

(Folkman & Lazarus, 1988). The WCQ questionnaire accounts for the dynamic nature of the coping process while also assessing tendencies toward problem-focused or emotion-focused coping.

During administration of the WCQ participants were instructed to recall the most stressful situation related to being HIV positive they experienced in the past week. Next, they were asked to rate the extent to which they used certain coping strategies during this stressful encounter. The response format is a four-point Likert scale that ranges from 0 (not used) to 4 (used a great deal). Factor analysis of the WCQ revealed eight coping scales including 1) confrontive coping, 2) distancing, 3) self-controlling, 4) seeking social support, 5) accepting responsibility, 6) escape-avoidance, 7) planful problem solving, and 8) positive reappraisal (Folkman & Lazarus, 1988). The planful problem solving scale is representative of problem-focused coping; whereas, six of the other scales are representative of emotion-focused coping (distancing, self controlling, accepting responsibility, escape-avoidance, confrontive coping, and positive reappraisal). The seeking social support scale contains both problem-focused and emotion-focused coping items and cannot be considered to be indicative of a single form of coping. See Appendix B for a description of these coping scales. These scales can be considered separately or combined to obtain a total coping score (Folkman & Lazarus, 1988).

The WCQ has demonstrated good reliability and validity. The items were originally obtained by having individuals list the coping strategies they use in stressful situations. The authors consider this to be evidence of face validity. Construct validity was established by demonstrating congruence between theoretical predictions and research supporting coping as a process that consists of both problem-focused and emotion-focused strategies (Folkman & Lazarus, 1980; Folkman, Lazarus, Dunkel-Schetter, DeLongis, & Gruen, 1986; Folkman &

Lazarus, 1988). Due to the dynamic nature of the coping process, traditional test-retest reliability statistics are not provided. However, the authors reported measures of internal consistency with alpha coefficients ranging from .79 (Positive Reappraisal) to .61 (Distancing). The WOC questionnaire has been used successfully in research regarding coping with a variety of chronic illnesses including HIV (Namir, et al., 1987; Singh, et al., 1996).

Center for Epidemiological Studies Depression Scale (CES-D)

The CES-D is a 20-item self-report depression inventory that emphasizes the cognitive aspects of depression rather than somatic complaints (Radloff, 1977). Consequently, the CES-D is ideal for use with medical populations. Individuals rate the frequency of depressive symptomatology over the past week. The response format is a four point Likert scale that ranges from 0 (none of the time) to 3 (most or all of the time). Total scores range from 0 to 60 with scores above 16 indicating the presence of depression. Higher scores are indicative of increased depressive symptoms.

Substance Abuse

Substance abuse was measured in the following manner. First, substance abuse history was established via interviews with the patients during their initial appointments with at the HIV clinic. The presence of substance abuse was documented from progress notes made during each clinic visit. This information was used to obtain a measure of current substance abuse. Current substance abuse was defined as the presence (as indicated by medical record) of substance abuse during the three year time period.

Illness Severity

As discussed above, the principle target cell of HIV includes T-cells. Thus, a good and reliable measure of illness severity can be obtained by collecting absolute T-cell counts from

blood draws. Baseline T-cell counts were obtained through a chart review of routine laboratory reports. These T-cell counts were used as an index of illness severity. Additional information concerning illness severity was obtained by collecting baseline symptom counts. Baseline symptom counts are routinely collected during medical intake as a measure of illness severity. Increased symptoms occur with more progressed HIV infection and indicate greater illness (Fan et al., 2000). Symptom counts can range from 0 to 20. See Appendix C for a list of pertinent symptoms included in this count.

Procedure

Attendance information the current study was obtained through a retrospective review of the participants' medical records. Baseline data collection occurred between 1992 and 1995. Volunteers were consecutively recruited during their initial appointments with the HIV outpatient clinic. Participants included individuals who had been diagnosed with HIV and were receiving outpatient medical treatment at the above-mentioned clinic (EKL). Informed consent was obtained prior to participation in the study (see Appendix D). Demographic information was obtained from patient interviews conducted during the initial clinic appointment and from the baseline demographics questionnaire completed by patients. Information concerning disease status and other medical information was obtained through a review of the patients' medical records at baseline. Participants were paid five dollars for completion of the baseline questionnaires.

Following baseline data collection all scheduled clinic appointments, including physician and nurse visits, were monitored via chart reviews for a period of three years from the patient's entry into the study. Appointment attendance information (frequency of scheduled, canceled, and "no show" appointments) was obtained from a retrospective review of the patients' medical

records. When available, other important information such as changes in attending physician and reason for discharge from the clinic (e.g. deceased, relocating) was also recorded during examination of the patients' medical records.

Research Design

A retrospective review of the medical records was conducted in order to determine the frequency of participants' appointment adherence on a long-term basis. The primary focus of the study was to determine the predictive value of coping strategies on appointment attendance above and beyond demographic factors, illness severity, and distress variables (substance abuse, depression). Participants completed baseline data and their medical attendance was tracked for a period of three years. As to maximize predictive validity over time, only individuals who completed the three years of treatment and did not drop out for any reason (e.g., death relocation, lost to follow-up) were included in the multiple regression analysis. Analysis of individuals who were classified as "attenders" and "nonattenders" was conducted on an annual basis.

Results

Analysis of Demographic Data

A total of 160 participants completed baseline evaluation measures. Appointment attendance was retrospectively tracked over a three-year period. Three years following intake, 83 individuals remained in treatment at the clinic. Clinic appointments are often scheduled on an irregular basis and appointments may be scheduled as few as three to four times yearly. Consequently, attempts were made to maximize predictive validity in the current study and only individuals who completed the three years of treatment and did not drop out for any reason (e.g., death relocation, lost to follow-up) were included in the multiple regression analysis. Although this procedure introduces a selection threat to validity, the data set remained strong and did not suffer greatly due to this selection bias. Demographic characteristics of the two samples were very similar and no significant differences occurred between the two samples. A comparison of the total sample (N=160) and the sample included in the regression analysis (N=83) is presented in Table 1. Analysis of the regression residuals also reveals an approximate normal distribution. These results can be found in Figure 1.

The regression sample consisted primarily of African American males with an average of 12 (SD=2.36) years of education. The average age of the participants was approximately 33 (SD=7.83) years old.

Means and standard deviations were computed for the independent variables of interest including T-cell counts, symptom counts, CES-D scores, and for each of the WCQ scales. These results can be found in Table 2. On average participants reported relatively few HIV symptoms and T-Cell counts above the level required for an AIDS diagnosis. Thus, most of the sample did not exhibit symptoms associated with severe illness. The sample reported increased depressive

symptoms, as the mean score on the CES-D (M=21.89) was above the score, which is indicative of elevated depressive symptoms (16).

Table 1. Sample Comparison: Demographic Characteristics

Variable	Total Sample (N=160)		Regression Sample (N=83)	
	N	%	N	%
Gender				
Male	97	60.6	48	57.8
Female	63	39.4	35	42.2
Ethnicity				
Caucasian	104	65.0	32	38.6
Minority	53	33.1	51	61.4
	3	1.9		
Orientation				
Heterosexual	102	63.8	50	60.2
Caucasian	17	10.6	9	10.8
Minority	83	51.9	41	49.4
Male	41	25.6	16	19.3
Female	61	38.1	34	41.0
Homosexual/Bisexual	57	35.6	33	39.8
Caucasian	36	22.5	23	27.7
Minority	20	12.5	9	10.8
Male	56	35	32	38.6
Female	1	.63	1	1.2
IV Drug Use History	56	35.0	24	28.9
Caucasian	14	8.8	7	7.4
Minority	41	25.6	17	20.5
Male	39	24.4	18	21.7
Female	1	.6	6	7.2

Table 2. Descriptive Statistics of Study Completers

Variable	<i>M</i>	(<i>SD</i>)	Range
Symptoms	2.30	(2.37)	0-13
T-Cell Count	422.02	(296.35)	30-1554
CES-D	21.89	(13.04)	0 – 55
WCQ			
Confrontive	7.24	3.95	0-16
Distancing	9.63	3.95	1-17
Controlling	12.02	3.87	2-20
Seeking Social Support	9.90	4.21	0-18
Accepting Responsibility	6.07	2.95	0-12
Escape-Avoidance	11.78	4.99	0-23
Planful Problem Solving	9.80	4.20	2-21
Positive Reappraisal	13.30	4.87	2-21

Pearson correlations were computed to examine possible significant relationships between demographic factors, illness severity factors, depression, and total percentage of appointments attended. Increased education was significantly correlated with fewer depressive symptoms on the CES-D. Total attendance was negatively correlated with T-cell counts and depressive symptoms. The correlation matrix of demographic and medical variables is located in Table 3. As expected each of the WCQ scales were significantly intercorrelated, indicating that the current participants interpreted the WCQ in a similar fashion to the validation sample. These results can be found in Table 4.

Significant correlations were also noted between the CES-D and several emotion-focused coping scales of the WCQ including confrontive ($r(80) = .43, p < .01$), distancing ($r(80) = .26, p < .05$), self-controlling ($r(80) = .30, p < .01$), accepting responsibility ($r(80) = .48, p < .01$), and escape-avoidance ($r(80) = .47, p < .01$). Education was negatively correlated with the confrontive ($r(83) = -.31, p < .01$), seeking social support ($r(83) = -.24, p < .05$), and escape avoidance ($r(83) = -.26, p < .05$) subscales of the WCQ. Total percent attendance was negatively correlated with

emotion-focused scales of the WCQ including confrontive ($r(83) = -.42, p < .01$), self-controlling ($r(83) = -.26, p < .05$), accepting responsibility ($r(80) = -.33, p < .01$), and escape-avoidance ($r(83) = -.23, p < .05$).

Table 3. Correlation Matrix: Demographic and Medical Variables

	1	2	3	4	5	6
1. Age	-	.42	-.07	-.10	-.03	.18
2. Education		-	-.14	-.12	-.24*	.17
3. Symptoms			-	-.05	.10	-.04
4. T-Cell Count				-	-.04	-.23*
5. CES-D					-	-.30**
6. Total % Attendance						-

* $p < .05$

** $p < .01$

Table 4. Correlation Matrix: Intercorrelations among WCQ Scales

	1	2	3	4	5	6	7	8
1. Confrontive	-	.47**	.50**	.48**	.61**	.62**	.42**	.29**
2. Distancing		-	.51**	.24*	.52**	.61**	.45**	.37**
3. Self-Controlling			-	.33**	.56**	.56**	.53**	.52**
4. Seeking Social Support				-	.35**	.29**	.44**	.52*
5. Accepting Responsibility					-	.59**	.52*	.34**
6. Escape-Avoidance						-	.37**	.26*
7. Planful Problem Solving							-	.58**
8. Positive Reappraisal								-

* $p < .05$

** $p < .01$

T-tests were computed to determine the presence of any significant group differences between gender, ethnicity, and participants with a history of intravenous drug use on illness related factors, coping strategies, or total percentage of appointments attended. A Bonferroni correction was used to control for the overall error rate associated with performing multiple t-tests. An adjusted significance level of .004 was used for the following analyses. Results indicated that females ($M=545$) demonstrated significantly higher T-cell counts ($t(47) = 2.98, p = .004$) than males ($M=338$). Females ($M=1.43$) also demonstrated fewer HIV related symptoms ($t(78) = -3.05, p = .003$) than males ($M=2.98$). When compared to Caucasians ($M=309$), minorities ($M=495$) demonstrated higher T-cell counts ($t(74) = -3.22, p = .002$). Minority individuals ($M=66.8\%$) also demonstrated significantly decreased percentage appointment attendance ($t(79) = 4.39, p < .001$) when compared to Caucasians ($M=82\%$). Minority participants ($M=14.47$) utilized more of the emotion focused coping technique, positive reappraisal ($t(80) = -2.88, p = .004$) than Caucasian participants ($M=11.41$). Participants who reported a history of intravenous drug use ($M=9.79$) were more likely to use confrontive ways of coping ($t(80) = -4.16, p < .001$) than participants with no prior drug use history ($M=6.14$).

Analysis of Total Attendance

A wide range of variability was noted in the attendance data, indicating that range restriction did not limit the validity of the current data set. The average attendance ($N=107$) for the total three-year period was 70% with scores ranging from 0% to 100%. Average attendance for year one ($N=160$) was 71% (range= 0-100), year two ($N=104$) was 66% (range= 0-100), and year three was 65% (range = 0-100). As mentioned above, total percentage attendance was significantly and negatively correlated with T-cell counts and depression.

Analysis of Coping and Attendance

Correlational analysis was conducted to determine the strength of association between coping strategies and total attendance. Total percentage attendance was significantly and negatively associated with emotion focused coping strategies including confrontive ($r(96) = -.31, p = .001$), self-controlling ($r(97) = -.23, p = .02$), accepting responsibility ($r(97) = -.27, p = .005$), and positive re-appraisal ($r(97) = -.23, p = .02$). The relationship between coping and appointment attendance was also evaluated on an annual basis. Only one emotion-focused coping strategy remained significantly correlated with appointment attendance for each of the three years and total percentage attendance. Confrontive coping was significantly associated with appointment attendance in year one ($r(155) = -.20, p = .02$), year two ($r(104) = -.23, p = .02$), and year three ($r(96) = -.24, p = .02$). Distancing ($r(156) = -.25, p = .002$), self-controlling ($r(156) = -.22, p = .005$), and escape-avoidance, ($r(156) = -.16, p = .05$) was significantly associated with attendance in year one. Accepting responsibility was significantly correlated with attendance in year one ($r(156) = -.17, p = .04$) and year two ($r(104) = -.26, p = .009$).

Proportional data are particularly susceptible to skewness and may not be normally distributed (Cohen & Cohen, 1983). The procedure for determining if a score transformation is appropriate for a data set that was suggested by Cohen & Cohen (1983) was conducted with the current data set. Residual scatterplots were examined for linear irregularities. The data for total percent attendance did not require score transformations, as the data approached a normal distribution that was significantly disrupted by a score transformation. See Figure 1 for the histogram of regression residuals.

Regression analysis was conducted to explore the effects of coping on appointment attendance using a hierarchical regression procedure. In order to control for variables that may

significantly impact attendance, these variables (i.e., age, sex, race, education, sexual orientation, HIV related symptoms, T-cell counts, intravenous drug use, and CES-D scores) were entered in the first block of the regression model as a set. For the second block, emotion focused coping scales (confrontive, distancing, self-controlling, accepting responsibility, escape-avoidance, positive reappraisal, seeking social support) were entered in a stepwise fashion. Finally, problem-focused coping (planful problem solving) was entered in the third block in a stepwise fashion.

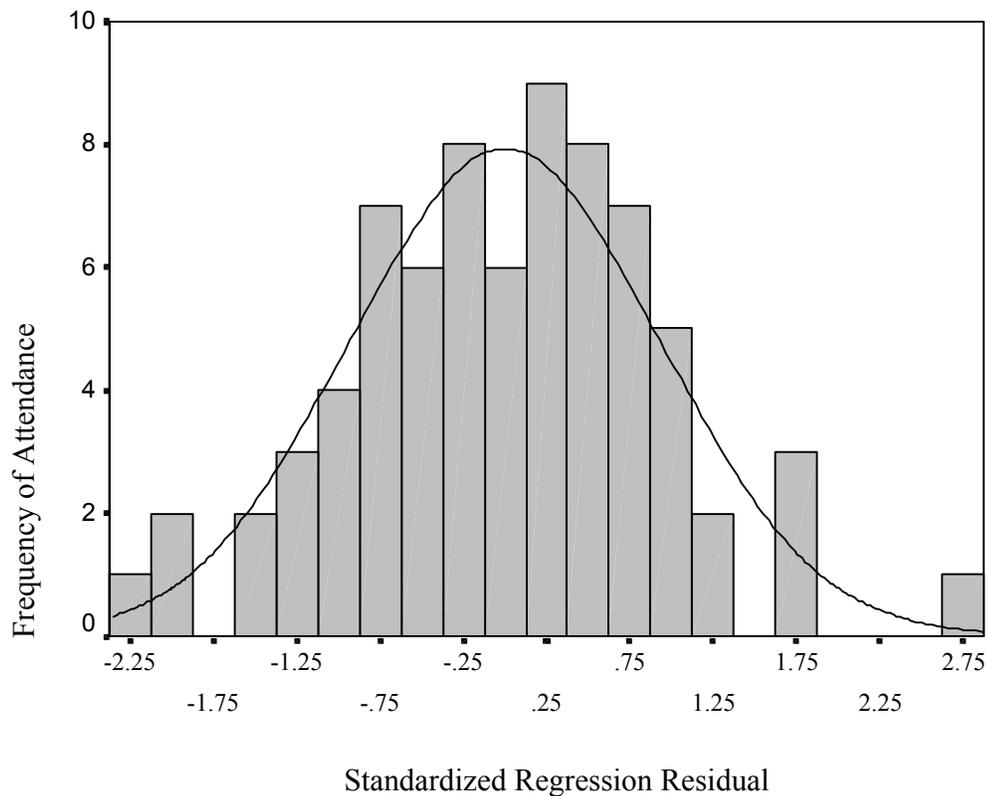


Figure 1. Histogram of Regression Residuals

The overall regression model did not support the hypothesis that coping skills would predict variance in long-term appointment attendance beyond the level of prediction offered by demographic and distress related (CES-D, intravenous drug use) variables. The regression model revealed that minority status (Beta = -.25), intravenous drug use (Beta = -.36), and

depression (Beta = -.23) were highly associated with appointment attendance ($R^2(9, 64) = .30, p < .001$). Analysis of squared semipartial correlation coefficients indicate that intravenous drug use accounted for the most variance (8%) with ethnicity and depressive symptoms accounting for 4% of the variance in appointment attendance. See Table 5 for a summary of the hierarchical regression analysis. Post-hoc power analysis was conducted following the procedure suggested by Cohen (1992) and a moderate degree of power (.72) was estimated.

Table 5. Multiple Regression Analysis: Coping and Appointment Adherence

Variable	β	t	Squared Semipartial Correlation
Age	.19	1.79	.03
Gender	.23	1.45	.02
Ethnicity	-.25	-2.04*	.04
Education	-.08	-.71	.005
Sexual Orientation	-.07	-.50	.002
Intravenous Drug Use	-.36	-2.95**	.08
T-Cells	-.19	-1.73	.03
HIV Symptom Count	-.08	-.75	.005
Depressive Symptoms	-.23	-2.12*	.04

* $p < .05$
 ** $p < .01$

Analysis of Attenders vs. Nonattenders on an Annual Basis

Since the multiple regression analyses was conducted on a subset of the total sample, further analysis evaluating factors relating to appointment attendance on an annual basis was necessary. This will allow for determination regarding the relative contribution (if any) of significant results found in the multiple regression analysis. To further examine group differences in attendance by year, chi square analysis was conducted. For the following

analyses, “attenders” were defined as attending at least 80% of scheduled appointments within the year. The total sample (N=160) was used to conduct the following analyses. This allows for an evaluation of factors related to attendance on an annual basis. Individuals with less than 80% total attendance were classified as “nonattenders”. Eighty percent adherence has typically been used as a gold standard to measure “successful adherence” in medication adherence. Because relatively few studies regarding HIV appointment attendance exist, no prior studies have classified individuals as “attenders” vs. “nonattenders” using a percentage of total appointments. Consequently, the known gold standard was utilized for this study. A stricter definition of adherence would have also significantly reduced sample size and not have allowed for comparisons between these two groups. Since only three participants were Hispanic and the rest of the minority sample was African American, ethnicity was grouped as Caucasian and Minority. Bonferroni corrections were used in interpreting the significance of each chi square test. The following analyses were interpreted based on an alpha level of .004.

Analysis of Attenders vs. Nonattenders by Ethnicity

The chi-square test of independence was used to determine if attendance to medical appointments was dependent on demographic group membership for each year of the study. When expected attendance was compared among Caucasian and Minority participants, chi square tests were significant for year one, $\chi^2(df=1, N=160) = 10.84, p = .001$, and year two, $\chi^2(df=1, N=104) = 15.41, p < .001$, but not year three. Thus, Minority participants demonstrated higher levels of appointment nonattendance than their Caucasian counterparts during year one and year two. These chi square results can be found in Table 6 – Table 8.

Table 6. Year One: Chi-square Test of Independence for Attendance: Ethnicity

Variable	Caucasian	Minority	χ^2	<i>df</i>	Significance
Attendance					
Yes	28	31	10.84	1	$p = .001$
No	25	76			

Table 7. Year Two: Chi-square Test of Independence for Attendance: Ethnicity

Variable	Caucasian	Minority	χ^2	<i>df</i>	Significance
Attendance					
Yes	27	22	15.41	1	$p < .001$
No	10	45			

Table 8. Year Three: Chi-square Test of Independence for Attendance: Ethnicity

Variable	Caucasian	Minority	χ^2	<i>df</i>	Significance
Attendance					
Yes	17	22	1.71	1	$p = .28$
No	9	39			

Analysis of Attenders vs. Nonattenders by Gender

The chi-square test of independence was used to determine if attendance to medical appointments was dependent on gender during each year of the study. When expected attendance was compared among male and female participants, significant differences were only noted in year two $\chi^2 (df = 1, N = 104) = 16.36, p < .001$, with males being more likely to attend appointments than females. These Chi square results can be found in Table 9 – Table 11.

Table 9. Year One: Chi-square Test of Independence for Attendance: Gender

Variable	Male	Female	χ^2	<i>df</i>	Significance
Attendance					
Yes	38	21	.56	1	$p = .45$
No	21	42			

Table 10. Year Two: Chi-square Test of Independence for Attendance: Gender

Variable	Male	Female	χ^2	<i>df</i>	Significance
Attendance					
Yes	38	11	16.36	1	$p < .001$
No	59	34			

Table 11. Year Three: Chi-square Test of Independence for Attendance: Gender

Variable	Male	Female	χ^2	<i>df</i>	Significance
Attendance					
Yes	24	18	.10	1	$p = .75$
No	28	24			

Analysis of Attenders vs. Nonattenders by Sexual Orientation

The chi-square test of independence was used to determine if attendance to medical appointments was dependent on sexual orientation. When expected attendance was compared among participants who identified as heterosexual and homosexual, significant differences were noted in year two only $\chi^2(df = 1, N = 104) = 9.54, p = .002$, with participants who were heterosexual participants being less likely to attend appointments than participants who were homosexual. These chi square results can be found in Table 12 – Table 14.

Table 12. Year One: Chi-square Test of Independence for Attendance: Orientation

Variable	Heterosexual	Homosexual	χ^2	<i>df</i>	Significance
Attendance					
Yes	34	25	1.74	1	$p = .19$
No	68	32			

Table 13. Year Two: Chi-square Test of Independence for Attendance: Orientation

Variable	Heterosexual	Homosexual	χ^2	<i>df</i>	Significance
Attendance					
Yes	22	27	9.54	1	$p = .002$
No	41	14			

Table 14. Year Three: Chi-square Test of Independence for Attendance: Orientation

Variable	Heterosexual	Homosexual	χ^2	<i>df</i>	Significance
Attendance					
Yes	24	18	1.03	1	$p = .311$
No	35	17			

Analysis of Attenders vs. Nonattenders by Intravenous Drug Use History

The chi-square test of independence was used to determine if attendance to medical appointments was dependent on history of intravenous drug use (IV Drug Use). When expected attendance was compared among participants with and without a history of intravenous drug use, no significant differences were noted. These chi square results can be found in Table 15 – Table 17.

Table 15. Year One: Chi-square Test of Independence for Attendance: IV Drug Use

Variable	IVDU	No IVDU	χ^2	<i>Df</i>	Significance
Attendance					
Yes	18	40	.778	1	$p = .378$
No	38	62			

Table 16. Year Two: Chi-square Test of Independence for Attendance: IV Drug Use

Variable	IVDU	No IVDU	χ^2	<i>Df</i>	Significance
Attendance					
Yes	13	36	1.77	1	<i>p</i> = .183
No	21	33			

Table 17. Year Three: Chi-square Test of Independence for Attendance: IV Drug Use

Variable	IVDU	No IVDU	χ^2	<i>df</i>	Significance
Attendance					
Yes	8	34	4.96	1	<i>p</i> = .026
No	21	31			

Analysis of Attenders vs. Nonattenders by Current Substance Abuse

The chi-square test of independence was used to determine if attendance to medical appointments was dependent on current substance abuse as noted by physicians and nurses during clinic visits. When expected attendance was compared among participants with and without current substance abuse, no significant differences were noted in year one or year two. Because only two participants were noted to have difficulty with substance abuse, analysis of year three data could not be conducted. These chi square results can be found in Table 18 – Table 19.

Table 18. Year One: Chi-square Test of Independence for Attendance: Substance Abuse

Variable	Substance Abuse	No Substance Abuse	χ^2	<i>Df</i>	Significance
Attendance					
Yes	4	18	3.83	1	<i>p</i> = .04
No	55	83			

Table 19. Year Two: Chi-square Test of Independence for Attendance: Substance Abuse

Variable	Substance Abuse	No Substance Abuse	χ^2	Df	Significance
Attendance					
Yes	5	44	.28	1	$p = .43$
No	4	51			

Analyses of Attrition-Related Variables

The data were examined to determine the frequency of attrition over the three-year study period and to investigate potential demographic group-related variables. During the first year of the study 6 participants died (3.8%), 15 participants were lost to follow-up (9.6%), and 7 participants appropriately transferred their care to another medical clinic (4.5%). During the second year of the study, 9 participants died (7.5%), 21 participants were lost to follow-up (17.5%), and 3 participants appropriately transferred their care to another medical clinic (2.5%). During the third year of the study, 1 participant died (.9%), 17 participants were lost to follow-up (15.9%), and 5 participants appropriately transferred their care to another medical clinic (3.2%). The presence of current substance abuse steadily declined as the study progressed beginning with 21 participants (13.5%) in year one, and declining to 9 participants (7.5%) in year two and 2 participants (1.9%) in year three. See Table 20 for these results.

Table 20. Percentage of Sample Attrition by Study Year

	Death	Lost to Follow-Up	Appropriate Transfer
Year One	3.8% (N=6)	9.6% (N=15)	4.5% (N=7)
Year Two	7.5% (N=9)	17.5% (N=21)	2.5% (N=3)
Year Three	.09% (N=1)	15.9% (N=17)	3.2% (N=5)

In order to determine if significant group differences occurred in attrition, chi square tests of independence were conducted. Men were more likely to be lost to follow-up than females in year one, $\chi^2(df=1, N=156) = 5.04, p = .025$. Minorities were more likely to be lost-to follow-up in year two, $\chi^2(df=1, N=129) = 6.745, p = .009$. Also, having a history of intravenous drug use in year one made substance abuse in year one of the study more likely $\chi^2(df=1, N=154) = 8.14, p = .004$. No other significant differences were found between groups (ethnicity, gender, orientation, intravenous drug use) on attrition related variables.

The largest reason for attrition in the current study was loss to follow up. This indicates that many participants failed to return to the clinic with no warning and effectively dropped out of treatment. If these individuals did not seek treatment at other facilities, they may have posed an increased risk of further transmitting HIV to others. To further examine factors associated with participants who were lost to follow up in the current study, a multiple regression analysis was conducted. Demographic factors (gender, ethnicity, age, education, and sexual orientation), illness related factors (T-cell count, symptoms count), and distress related variables (intravenous drug use history, current substance abuse, and depressive symptoms) were entered into a regression equation to determine if these variables significantly predicted individuals who dropped out of treatment. Separate analyses were conducted for each study year. Significant results were only noted in year one. The regression revealed that in year one of the study participants who were of younger age (Beta= -.194), male (Beta=. 362), and demonstrated increased depressive symptoms (Beta=. 228) were more likely to be lost to follow up ($R^2(10, 118) = .17, p = .01$). See Table 22 for a summary of these results.

Table 22. Multiple Regression Analysis: Lost to Follow Up

Variable	β	t	Squared Semipartial Correlation
Age	-.19	-2.05*	.03
Gender	.36	2.98**	.06
Ethnicity	-.21	1.96	.03
Education	.05	.53	.04
Sexual Orientation	-.06	-.46	.001
Intravenous Drug Use	-.01	-.05	.00006
T-Cells	-.16	-1.6	.02
HIV Symptom Count	-.23	2.58*	.05
Depressive Symptoms			

* $p < .05$

** $p < .01$

Discussion

The results of the current study did not support the primary hypothesis that coping strategies would significantly predict appointment attendance above and beyond other demographic and distress related variables on a long-term basis. Multiple regression analysis revealed the coping style that participants used to adjust to HIV-related stressors did not impact their appointment attendance over a three-year follow-up period. Although the study failed to support the primary hypothesis, important findings were noted. Demographic factors including ethnicity, history of intravenous drug use, and depressive symptoms predicted future adherence with medical appointments on a long-term basis. Specifically, minority status, increased endorsement of depressive symptoms, and a positive history of intravenous drug use was associated with higher levels of appointment non-attendance. These results must be interpreted with caution as they were only noted during a regression analysis of a highly selective sample of individuals who remained in treatment for a three-year time period. Analysis of the entire sample on an annual basis only showed that ethnicity was an important factor related to nonattendance in year one and two of the study. Consequently, generalizability of the current results is limited.

Appointment Attendance

Ethnicity and Appointment Attendance

Ethnicity was predictive of failure to attend HIV clinic appointments for a period of three years after initial contact with the clinic. Although other studies have noted decreased appointment attendance among minority individuals (Catz, et al., Israelaski, et. al., 2001; McClure, et al., 1999), this is the first known study to evaluate the impact of psychosocial factors in appointment adherence on a long-term basis. The current results add to a growing body of

literature finding that minority individuals demonstrated reduced attendance to scheduled HIV clinic appointments. However, none of these studies have investigated the specific variables associated with minority individuals that lead to decreased appointment adherence. Given that minority status continues to impact appointment attendance on a long-term basis, research regarding these issues is necessary. Factors related to socioeconomic status (SES) such as inadequate financial means, poor access to medical care, limited education, and poor community support have been found to be important in adherence in other chronic illnesses and may also be important in individuals with HIV (Rimer, et al., 1996). Since these factors were not part of the primary hypotheses being evaluated, the current study was unable to adequately examine these variables. For example, the present sample was comprised of indigent individuals with approximately 87% of the sample reporting annual incomes at or below \$10,000 and did not allow for analysis of income-related variables. The only other variable related to SES in the current study included education. Education level was not significantly related to attendance variables, but was related to increased depressive symptoms.

Depressive Symptoms and Appointment Attendance

Depressive symptoms have been found to negatively impact adherence with HIV treatment regimens (Bogart, et al., 2000, Catz, et al., 2000; Kalichman et al., 2000; Rabkin & Chesney, 1999). The current study showed that increased depression at clinic intake was associated with higher levels of appointment non-attendance over a three year time period. Thus, increased presence of depressive symptoms may be a risk factor not only for medication adherence, but also for failing to meet other HIV treatment requirements like appointment attendance.

Failure to attend appointments can have serious consequences on overall health and well being for individuals with HIV (Lucas et al., 1999). Since depression appears to be a major risk factor for adherence difficulties, HIV clinics should address this issue with all patients. The results of this study suggest that including a psychometrically sound screening instrument during initial contact with patients may help identify individuals who are risk for failing to attend regularly scheduled appointments on a long term basis. This information can be used to develop targeted interventions aimed at preventing appointment nonadherence. Many clinics already obtain information concerning depressive symptoms, but may not administer a standardized scale, which would ensure adequate assessment of depressive symptoms. Screening for depressive symptoms is straightforward, can be easily included in the intake process, and has the potential to greatly benefit patients.

Increased depressive symptoms were noted in the current sample. The mean CES-D score ($M=21.89$) was above the cutoff score (16) indicating the presence of significantly elevated depressive symptoms. Although not found in all samples, the current increased level of reported depressive symptoms in individuals with HIV is consistent with prior literature (Heckman, et al., 1999; Griffin & Rabkin, 1997). Griffin and Rabkin (1997) noted that increased depressive symptoms frequently occur in research studies conducted in clinic settings, particularly when the assessments were obtained at clinic intake. A large amount of variability also existed in this data ($SD=13.04$). Thus, the majority of depressive symptoms may have been experienced by certain segments of the sample. Increased depressive symptoms were associated with individuals who had decreased levels of education. Consequently, the current results regarding depression and long-term appointment attendance should be interpreted with caution and future studies replicating these effects would be useful.

Intravenous Drug Use History and Appointment Attendance

A history of intravenous drug abuse emerged as an important predictor of appointment attendance on a long-term basis. This is consistent with previous literature concerning history of illicit drug use and appointment attendance (Kissinger, et al., 1995; McClure, et al., 1999). The current results showed that a history of intravenous drug use remains an important risk factor for failure to attend appointments even three years after intake into the clinic. This highlights the importance of obtaining detailed information concerning drug use history, as past substance abuse is highly associated with continued use during treatment. The longer individuals were in treatment, the less likely they were to demonstrate current substance abuse. Outside of coping style, the current study was not specifically designed to evaluate factors related to substance use that negatively impact appointment attendance. However, the current results suggest that understanding the relationship between substance abuse and treatment adherence behaviors is needed. The current results coupled with evidence that substance abuse interferes with medication adherence suggest that a primary method to increase HIV treatment adherence in individuals with substance abuse may be to help them reduce or eliminate their substance use (Eldred et al., 1998).

Coping

Coping and Appointment Attendance

Appointment attendance over a three-year period was negatively associated with emotion-focused coping including confrontive, self-controlling, accepting responsibility, and positive reappraisal coping strategies. Of these strategies, a confrontive coping strategy remained negatively associated with appointment attendance during each year of the study. This suggests that individuals who handle problems or stressors through destructive or risky means

are more likely to demonstrated reduced appointment attendance. Other emotion focused coping appeared to have more of a negative impact on coping during the first year of treatment. These results were noted during correlational analysis and did not maintain their significance when demographic, illness-related, and distress-related factors were entered into a multiple regression analysis.

The current study showed that coping style (emotion-focused vs. problem-focused) did not significantly impact appointment adherence. However, other studies have found that coping is an important variable in improving HIV treatment adherence (Singh, 1996, Singh, 1999). Explanations for the discrepancy of these results must be explored. Prior studies that have noted the importance of coping in HIV treatment have been conducted with combination medication regimens. It may be the case that coping strategy is important to medication adherence and not to appointment attendance. Medication adherence requires continuous effort on a daily basis from patients; whereas, appointment attendance occurs on an irregular basis and tend to be scheduled at varying time intervals.

The coping literature suffers from a lack of cohesiveness, with researchers using different definitions of coping and different measures to assess coping skills. It may be the case that these variations in methodology also produce variations in research results. The current study evaluated coping during initial contact with the patient and did not analyze coping on a longitudinal basis. Although we attempted to stabilize the coping measure by concentrating on HIV-related stressors, this procedure may not have fully accounted for the dynamic nature of the coping process. Initial coping strategies may not influence long-term adherence behaviors due to changes in coping over time. The current study also utilized a situation (i.e., being diagnosed with HIV and attending treatment) that is perceived as uncontrollable rather than measuring an

individual's perception of controllability of HIV-related stressors. Although this is a common methodological shortcoming in studies of coping, it still does not give us a true indication of the effects of coping on behavioral aspects of adherence. Ideally, coping should be evaluated repeatedly over time and include perceptions of the participants perceived controllability over the stressors (Park, Folkman, & Bostrom, 2001).

Coping and Ethnicity

It was hypothesized that minority individuals would utilize significantly more emotion-focused coping strategies and report increased levels of depression when compared to their Caucasian counterparts. The current results revealed that minorities utilized emotion-focused coping strategies more than problem-focused coping strategies. Specifically, minority participants in this study were more likely to utilize positive reappraisal as a specific coping strategy. These results are consistent with a growing body of evidence highlighting ethnic differences in coping with HIV-related stressors (Heckman, et al., 1999; Lesserman, et al., 1992; Singh et al., 1999).

However, minority individuals (primarily African Americans) did not endorse significantly increased depressive symptoms when compared to Caucasian participants. Although, these results differ from some published studies (Leserman et al., 1992; Singh et al., 1999), they are consistent with at least one other research study that included primarily low-income African American participants (Heckman et al., 1999). These results suggest that emotion-focused coping is not inevitably a negative influence on the adjustment process. There was no evidence in the current study to suggest that problem-focused coping is associated with decreased endorsement of depressive symptoms. Perhaps other variables such as perceived controllability or social support that were not specifically evaluated in this study may be utilized

more frequently by minority individuals. These variables may offer a protective shield or buffer against psychological distress regardless of type of coping strategy utilized.

Relationship between Coping and Depressive Symptoms

Emotion-focused coping was significantly associated with increased endorsement of depressive symptoms. Specifically, participants who utilized confrontive, distancing, self-controlling, escape-avoidance, and strategies that involved accepting responsibility for being HIV- positive reported increased depressive symptoms. This suggests that individuals who respond to the stress associated with being HIV positive with increased hostility, avoidance, self-blame, detachment, and strict regulation of thoughts or emotions may experience increased emotional distress and depressive symptoms. Again, no protective benefits of problem-focused coping were noted to be significantly associated with decreased depressive symptoms.

Substance Use and Coping

It was hypothesized that participants with a history of substance abuse would utilize emotion-focused coping strategies more than problem focused coping strategies. Specifically, it was expected that participants with a history of substance abuse would utilize significantly more avoidant coping than participants who had no history of substance abuse. In other populations, increased use of avoidant coping has been noted in individuals with a history of substance use (Avants, Warburton, & Margolin, 2000; Belding, et al., 1996). However, the current results showed that individuals with a history of intravenous drug use utilized significantly more confrontive coping strategies. These coping strategies include aggressive or hostile efforts to resolve a stressful situation.

The differences noted in the current study may reflect the use of different assessment instruments to evaluate coping strategies. These differences may also be related to different

sampling procedures. Much of the current literature regarding HIV and substance use has been conducted at outpatient substance abuse treatment centers. The current study consisted of primarily low-income participants who were receiving treatment at an ambulatory outpatient HIV clinic associated with a public teaching hospital. It may be that these community samples are confronted with economical and cultural issues, such as living with community violence, that differs from participants in other research samples (Plummer & Slane, 1996). Further research regarding the role of coping in individuals with substance abuse and subsequent impact on adherence behaviors is needed.

Summary

The primary purpose of the current study was to evaluate the effects of initial coping strategies on long-term appointment attendance in individuals with HIV. It was predicted that problem-focused coping would be associated with attending regularly scheduled clinic visits and emotion-focused coping would be predictive of failure to attend appointments. Attendance information was retrospectively obtained by reviewing medical records. Multiple regression analysis revealed that the coping style used by participants did not predict appointment attendance above and beyond the variance predicted by demographic, illness, and distress related factors. However, minority status, depressive symptoms, and history of intravenous drug use did emerge as reliable predictors of failure to attend scheduled clinic appointments over a three-year follow-up period. These data must be interpreted with caution because the sample included in the multiple regression bias was a subset of a smaller sample and is subject to selection bias. However, the strength of this data set is supported by the fact that no significant differences occurred between the total sample and regression sample and no evidence of range restriction was noted.

Although further research confirming these results with a broader sample that does not represent such a large selection bias is needed, these results suggest that information that is easily obtained during the patient's initial contact with the clinic may be critical in determining who is most at risk for failing to attend scheduled clinic appointments on a long-term basis. Since, attendance at clinic appointments is necessary to receive appropriate HIV medical care and to ensure treatment success, identification of variables related to non-attendance is important. Further research should evaluate the specific variables associated with poor appointment attendance among minority individuals.

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Appendix A

Demographics Questionnaire

Subject #: _____ Intake Date: _____
DOB: _____ EKL#: _____
Age: _____ Date of HIV Diagnosis: _____
Sex: Male Female
Race: Caucasian African American Hispanic Other: _____
Income (yearly): <\$10,000 \$10-20,000 \$20-30,000 \$30-40,000 >\$40,000
Education (Highest Grade Completed): _____
Marital Status: Single Married Divorced Widowed Other: _____
Sexual Orientation: Homo/Bisexual Heterosexual
Substance Use:
IV Drug Use: Yes (current/past) No
IV Drug Use Partner Yes No
Blood Recipient Yes No What Year? _____
Other Drug Use in Last 6 Months
Marijuana Y N Cocaine/Crack Y N LSD/Acid Y N
Speed/Crystal Meth Y N Rush/Ethyl/Poppers Y N
Tobacco Use Y N How Much Per Day? _____
ETOH Consumption: Y N
How Much? <7 oz week >7oz week Average Number (daily): _____
Antiretroviral Medications: Y N Names: _____ Date Started: _____
T-cell Counts: CD4 _____

Appendix B

Ways of Coping Questionnaire: Coping Subscales

Coping Subscale	Description
Confrontive Coping	Aggressive or hostile efforts to resolve the stressful situation
Self-Controlling	Efforts to regulate thoughts, behaviors, or emotions
Distancing	Cognitive efforts to detach from the stressful situation or minimize its impact
Seeking Social Support	Efforts to find emotional, social, and educational support from others
Accepting Responsibility	Recognizing personal role in the situation and attempts to correct any problems
Escape-Avoidance	Cognitive and behavioral efforts to escape or avoid the stressful situation.
Planful Problem Solving	Purposeful and well thought out efforts to solve the problem at hand
Positive Reappraisal	Efforts to create positive meaning by focusing on positive aspects of stressful situation (e.g., chance for personal growth). Religious reappraisal is also included here.

Appendix C

Symptom Checklist for HIV Infection

1. Oral candidiasis (ever)
2. Lymphadenopathy/thrush (by examination, currently)
3. Nonallergic body rash (history of, during last three months)
4. Shingles (history of, during last three months)
5. Sinusitis (history of, during last three months)
6. Oral leukoplakia (by examination, currently)
7. Fever (history of, during last three months)
8. Night sweats (history of, during last three months)
9. Rashing or scaling around eyes (history of, during last three months)
10. Diarrhea (history of, during last three months)
11. Psoriasis (history of, during last three months)
12. Shortness of breath (history of, during last three months)
13. Easy bruising (history of, during last three months)
14. Sore throat (history of, during last three months)
15. Persistent cough (history of, during last three months)
16. Meningitis (history of, during last three months)
17. Hair loss (history of, during last three months)
18. Pneumonia (history of, during last three months)
19. Herpes (oral/genital) (ever)
20. Weight loss (more than 10%) (history of, during last three months)

Appendix D

Informed Consent

Louisiana State University Medical Center in New Orleans

1. **Study Title:** The impact of stress, mood, and social support on HIV disease status
2. **Performance Sites:** Earl K. Long Medical Center, Baton Rouge, Louisiana.
3. **Names and Telephone Numbers of Investigators:**
 - For 24-hour access, please call (504) 358-1105
 - Phillip J. Brantley, Ph.D.(504) 358-1105
 - Glenn N. Jones, Ph.D.(504) 358-1105
 - Jennifer McClure(504) 358-1105
 - Sheryl Catz, M.A.(504) 358-3927
4. **Purpose of the Study:** This is a research study designed to investigate how stress, mood, and social support impact the health status of patients with HIV (Human Immunodeficiency Virus). Aside from participating in a brief psychological/medical history and filling out questionnaires (e.g., on stress, HIV symptoms, mood, and social support) about every six months, research subjects will not be treated any differently than other patients at the clinic. The laboratory analysis of immune functioning is part of the medical assessment that all patients undergo routinely.
5. **Subject Inclusion Criteria:** Individuals between the ages of 18 and 65 are eligible to participate in the study. Participants must be HIV positive.
6. **Subject Exclusion Criteria:** Individuals will not be eligible to participate in the study if they are unable to read or comprehend the nature of the questionnaires for any reason (e.g., illiteracy).
7. **Description of the Study:** During a routine clinic appointment, when laboratory analysis of immune functioning has been scheduled, patients at the clinic will be informed of the study by an attending nurse or physician. If a patient volunteers to participate, he/she will sign the informed consent. A graduate student in Clinical Psychology at Louisiana State University will conduct an interview to gather a brief medical and psychological history. Subjects then will complete questionnaires (e.g., on stressful life events, social support, mood, coping, and HIV symptoms). Subjects allow the experimenter access to their medical records to obtain laboratory reports and other medical information (e.g., medication usage, onset of symptoms, number of visits to the clinic). At or before regularly scheduled follow-up clinic appointments, participants will be reminded of the project and again asked to complete the questionnaires.
8. **Benefits to Subject:** Subjects will receive \$5.00 following each participation in the study. Other potential benefits may include increased knowledge about HIV and strategies to cope with the disease.

9. **Risks to Subject:** There are no known major physical, psychological, or social risks associated with participation in the study. However, there may be unforeseen risks associated with participation. Lesser risks can be explained if the subjects desire this information. Subjects should not expect their medical conditions to improve by participation in this study. If the subjects wish, the experimenter can provide a referral for additional assistance.

10. **Alternatives to Participation in the Study:** Participation is voluntary. Subjects who choose not to participate will attend their clinic appointments as usual.

11. **Subject Removal:** There are no foreseeable circumstances under which eligible subjects would be removed from the study against their wishes. Subjects who fail to return for their regularly scheduled clinic appointments (e.g., for over a year) may be removed from the study.

12. **Subject's Right to Refuse to Participate or Withdraw:** Study subjects may refuse to participate or withdraw from the study at any time without jeopardizing, in any way, their medical treatment at this institution in the present or the future. Should significant new findings develop during the course of the research which may relate to the subject's willingness to continue participation, that information will be provided to the subject.

13. **Subject's Right to Privacy:** The results of the study may be published, released to a funding agency or presented in a scholarly fashion (e.g., at a conference). The privacy and confidentiality of subjects will be protected, and they will not be identified in any way.

14. **Release of Information:** The medical records related to the study are available to the experimenter. By agreeing to participate in this research study and by signing the consent form, the subject gives permission for his/her attending medical staff to release relevant medical information (e.g., diagnoses, medications, rate of clinic attendance) to the experimenter.

15. **Financial Information:** A) Participation in this study will not result in any extra charges above and beyond those routinely incurred by patients with similar illnesses. B) The costs of study related and unforeseen complications must be met by subjects. C) **Subject Payment:** Subjects will be paid \$5.00 for participation in the study.

16. **Signatures:** The study has been discussed with me and all my questions have been answered. I understand that additional questions regarding the study should be directed to investigators listed on page 1 of this consent form. I understand that if I have questions about subjects' rights, or other concerns, I can contact Dr. Perry, G. Rigby, Chancellor, at (504) 568-4801. I agree with the terms above and acknowledge I have been given a copy of the consent form.

Signature of Subject

Date

Signature of Witness

Date

Vita

DeAnn Morris Johnson is a native of southeast Louisiana. She completed her undergraduate studies in 1995 at Southeastern Louisiana University where she graduated with honors in psychology. After completing her master's degree in psychology in 1997 at the same university, she pursued her doctoral degree in clinical psychology at Louisiana State University. She completed pre-doctoral training at the University of Alabama at Birmingham Medical School.