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RELIGIOSITY/SPIRITUALITY AS A PROTECTIVE FACTOR FOR POSTTRAUMATIC STRESS DISORDER AMONG AFRICAN AMERICAN STUDENTS AT JACKSON STATE UNIVERSITY

By

Danielle Weiss

Master of Public Health

Epidemiology

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By

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Abstract

RELIGIOSITY/SPIRITUALITY AS A PROTECTIVE FACTOR FOR POSTTRAUMATIC STRESS DISORDER AMONG AFRICAN AMERICAN STUDENTS AT JACKSON STATE UNIVERSITY

By Danielle Weiss

Background: Posttraumatic Stress Disorder (PTSD) affects approximately 20-40% of those who experience a potentially traumatic event (PTE). Because African Americans are, on average, are affected by the negative impact of trauma more frequently than Whites; they are at increased risk of developing PTSD. Religiosity/Spirituality (R/S) has been found to be inversely associated with an array of mental and physical illnesses, including anxiety disorders. Compared to Whites, African Americans – particularly those in the Southern United States - report higher levels of R/S. These findings guide the current study: to investigate the association between R/S and PTSD among African American undergraduate students at a large, urban University in the Southern United States.

Methods: The main R/S exposure variable was the first 14 items (FIRST14) of the Daily Spiritual Experiences Scale (DSES), summed. Sociodemographic and drug use variables were secondary exposures. Other R/S indicators included church attendance, denomination, and the 15th item of the DSES ("In general, how close do you feel to God?"). The main outcome variables were PTSD (Y/N) and PTSD (full vs. partial).

Results: The odds of students with strong R/S beliefs (FIRST14) meeting full PTSD diagnosis (vs. no PTSD) was 12.21 times greater than the odds of students with moderate or low R/S beliefs (CI: 2.93-50.98). Alcohol consumption also predicted PTSD diagnosis (OR=5.38, CI: 1.35-21.15), while item 15 of the DSES was a protective factor (OR=0.36, CI: 0.03-0.54). Regarding full vs. partial PTSD as the dependent variable; FIRST14 (OR=10.12, CI: 2.06-49.67) and age group 22-25 (OR=4.07, CI: 1.46-11.32) were risk factors and ITEM15 was a protective factor (OR=0.05, CI: 0.01-0.28).

Discussion: Subjective R/S (i.e. "In general, how close do you feel to God?") may be more relevant to African American college students in the South than other R/S dynamics presented in the DSES. While this is the first study to investigate the relationship between R/S and PTSD among Southern, African American students; there were several limitations including small sample size and lack of diversity.

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TABLE OF CONTENTS

LIST OF TABLES

BACKGROUND/INTRODUCTION

Exposure to potentially traumatic events (PTEs) is prevalent in the United States. Research suggests that approximately 40-80% of individuals are exposed to a PTE in their lifetimes; and about 60% of men and 50% of women live with traumatic stress (1-5). While research suggests Caucasians are more likely than Blacks to experience a PTE, African Americans are more likely to feel negative affect by the event (2). Negative affect is psychological distress or disturbance following a PTE; and is a precursor to posttraumatic stress disorder (PTSD). Further, risk of lifetime exposure to trauma is highest in urban areas; and research demonstrates that in these stressful environments, African Americans are more greatly affected by high-impact trauma (e.g. violent assault) and report greater posttraumatic stress symptom severity (i.e. symptoms such as persistence and re-experiencing used to assess PTSD), than Whites (2, 3, 6).

While the majority of individuals who do experience trauma recover, about 20-40% develop Posttraumatic Stress Disorder (PTSD) (7-9). Clinically defined as an anxiety disorder resulting from traumatic exposure, PTSD is a relatively common occurrence with a long duration (10). The National Epidemiologic Survey on Alcohol and Related Conditions estimated that between 2004 and 2005, the lifetime prevalence of PTSD among Americans over 18 was 6.6% - a slight decrease from 2003 estimates (6.8%); but a stark rise from the 2000 estimate of 3.5% (11, 12). Partial PTSD – which meets subthreshold diagnostic criteria – also causes considerable mental impairment (13). The lifetime prevalence of partial PTSD is comparable to PTSD; affecting 6.4% of the population (14).

Understood today as a consequence of trauma, Posttraumatic stress disorder (PTSD) was first recognized in the United States as a condition resulting from war. Referred to as *shell shock* during WWI and then later acknowledged with other war-related terms such as *post-Vietnam syndrome* and *combat fatigue*, PTSD was ultimately listed as an anxiety disorder in *The Diagnostic and Statistical Manual of Mental Disorders, Third Edition* (DSM-III) in 1980 (15). The current diagnostic manual, DSM-IV, assesses PTSD with four criteria, labeled A, B, C, and D. The letters represent symptoms presented in PTSD, which must persist for one month or longer to meet diagnosis criteria. Assessment begins with criterion A – examining whether an individual has "experienced, witnessed, or been confronted with an event that involves actual or threatened death or injury, or a threat to the physical integrity of oneself or others" *and* felt horror, fear, or helplessness from the event. Once criterion A is established, B, C, and D are assessed to determine whether or not PTSD is present. PTSD is diagnosed when one meets criterion A; exhibits symptoms of B criteria, re-experiencing the event and associated emotions; C criteria, persistent avoidance and numbing; and D criteria, increased arousal (16).

The prevalence of PTSD is notably higher among women than men (1). Between 2004 and 2005, the lifetime prevalence of PTSD among women was 8.6% while the lifetime prevalence for men was only 4.1% (13). This gender disparity is even greater in 12-month prevalence estimates of PTSD among men and women; 1.8% and 5.2%, respectively (12). While there is evidence of a gender gap, Chung and Breslau found that this disparity did not hold when controlling for disturbance class (i.e. severity of PTE); suggesting that this gap may be explained by women's greater susceptibility to sexual

trauma compared to men (17). Accordingly, the gender disparity is heightened in urban locations; with lifetime prevalence of PTSD affecting around 9-15% of women and about 6% of men (1, 3, 18, 19). The documented sociodemographic discrepancies place urban, African American women at greatest risk; with lifetime prevalence of PTSD affecting 30-45% of this population (3, 18, 20).

Other commonly cited risk factors for PTSD development include income, age, and substance use. A national assessment of PTSD prevalence indicated that those at highest risk of PTSD are young females with low-incomes. Individuals with a household income of $0 - $19,999 are almost twice as likely to experience PTSD (odds ratio (OR) = 2.3, 95% confidence interval (CI): 1.88, 2.74) compared to those with a household income of $35,000-$69,999 (13). In a community survey of 18-45 year olds, Breslau et al. discovered that exposure to PTEs peaked at ages 16-20 and after age 20, significantly declined (1). Research by Pietrzak et al. supports these findings; only 16.4% of 20-29 year olds reported no PTEs within the past year, compared to 29% of 30-44 year olds and 34.6% of 45-64 year olds (13). About one-third of those who suffer from PTSD, report their traumatic experience to derive from the sudden, unexpected death of a loved one. In lieu of this finding, Breslau et al. suggests that PTSD may vary with age due to the disparate nature of unanticipated death in younger versus older age groups. The likelihood of experiencing the natural death of a loved one in adolescence or young adulthood is minimal compared to older adults. However, the violent assault and resulting death of a loved one may traumatize an individual for a longer duration than a natural death (1). Kessler et al. determined that in the community, the median age of PTSD onset is 23 years (11).

PTSD is often comorbid with substance and alcohol abuse disorders; behaviors which may exacerbate debilitation and prolong traumatic healing (4, 13, 19, 21). The National Survey of Adolescents found that youths with past traumatic exposures are three times more likely to report current or previous drug use compared to those without traumatic exposure (22). The prevalence of co-occurrence is staggering; approximately 35-50% of individuals in drug treatment facilities have a lifetime diagnosis of PTSD (23). While research has demonstrated the frequent comorbidity of substance/alcohol abuse and PTSD, the temporal relationship is unclear. There is no consensus as to which – drug/alcohol abuse or PTSD - supersedes the other. There is empirical support for the use of drugs and alcohol as a coping mechanism to PTSD; as well as PTSD resulting from drug/alcohol derived emotional dysregulation (24-26).

Misclassification

The American Psychiatric Association provides clear guidelines to diagnose PTSD, yet, many cases continue to be misdiagnosed or missed entirely. This is in part due to overlapping symptoms present in a multitude of mental illnesses other than PTSD. Symptoms of criteria A, B, C, and D present themselves in illnesses such as depression and general anxiety disorder, hindering PTSD identification (15). This suggests that the manifestation of mental illness following trauma varies on an individual level – there is no PTSD litmus test as there is for infectious disease. Additionally, both partial PTSD and PTSD are risk factors for comorbidity development. Frequently cited comorbidities - and the corresponding odds of full PTSD versus no PTSD - are mood (ORs = 4.1-10.4), anxiety (ORs = 2.4-7.1), alcohol abuse (ORs = 1.7-2.5), substance abuse (ORs = 2.4-4.5) and conduct disorders (ORs = 2.9-3.1) (4, 13**)**. In an effort to catch cases, researchers

utilize DSM-IV derived scales that measure PTSD criteria and ultimately guide diagnosis.

Growth and Resiliency

While the root cause of PTSD is the experience of a traumatic event, most individuals who witness a potentially traumatic event (PTE) do not develop the condition and, in fact, report a sense of growth resulting from the event (27, 28). This phenomenon exists in the general public as well as special interest populations. Using a sample of inpatients at a Midwestern hospital (n=216), Riley et al. found that respondents affected with HIV, multiple sclerosis, cancer, and severe burns experienced significant growth after their diagnosis (a PTE) (29). Similar to the concept of growth, some assert that resiliency is at work, protecting individuals from severe mental/emotional impairment. Resiliency is the ability to mentally withstand a PTE and return to healthy mental functioning after brief bouts of distress. This phenomenon varies on an individual level, which is why some succumb to PTSD and others do not (28). Connor et al. examined the association between resiliency and PTSD severity among 1,200 U.S. adults; and found greater resiliency was significantly associated with lower levels of PTSD symptom severity (30). Bonnano suggests that those who are able to ‘bounce back’ after experiencing one traumatic event will be resilient if faced with a PTE in the future (28). Still, others attribute adversary growth and resiliency to religiosity/spirituality (R/S), which drives these cognitive changes. In a review of the literature on adversary growth, Linley and Joseph confirmed that religion is significantly associated with growth (31).

Religiosity/Spirituality (R/S)

The Pew Forum on Religion and Public Life's 2007 U.S. Religious Landscape Survey reported that 83.1% of the population is religious and only 16.9% do not belong to a religious denomination. However, 27% of respondents reported uncertainty of a personal God, suggesting that while religion is still an impressionable force in America, spirituality is a marked belief system (32). While there are numerous definitions of spirituality and religiosity in the scientific literature, the basic disparateness of religion and spirituality lies in the means by which life purpose is explored (30, 33). Echoing this, Riley et al. defines spirituality as having both a 'God' component; a direct, relationship with a higher being; and an existential component; a belief in self-directed purpose (29). Astrow et al. further distinguishes spirituality from religiosity by elucidating the means by which the two entities diverge; the search for transcendent meaning. Those who identify as spiritual, search for the meaning of transcendence by exploring a plethora of resources including (but not limited to) art, nature, personal beliefs, and social relationships. In comparison, religious individuals search for the meaning of transcendence with specific direction and guidance from a deity (34). Because both belief systems are integrated with the idea of transcendence and differ primarily by the incorporation of self-direction, the influence of religion and spirituality will be referred to as one idea in this study, Religiosity/Spirituality (R/S).

The prevalence of R/S varies with race/ethnicity and tends to be highest among African Americans (35). This relationship holds even when controlling for socioeconomic factors and denomination - potential confounders which vary among

ethnic groups and differentially influence religious participation (36). Thomas and Holmes found that the positive effects of R/S are also more pronounced in African Americans than in Whites of similar backgrounds (37). According to the Pew Center Forum on Religion and Public Life (PFRPL), African Americans report higher levels of R/S on all measures including beliefs about God and the afterlife, prayer, and church attendance when compared to the U.S. population as a whole (38). Additionally, Chatters et al. found that African Americans give higher priority to R/S compared to Caribbean Blacks and non-Hispanic Whites (39). The PFRPL also documented this R/S racial disparity with 79% of African Americans placing importance on R/S compared to 56% of the total population (38). Research indicates that the pivotal role of R/S in African American history and culture in and of itself perpetuates its significant standing in the Black community (40, 41). Historically, Black congregations have centered not only on R/S but also mobilization of the African American community politically and socially (42). The National Survey of Black Americans (NSBA) data indicate that religious participation is a significant media for informal social support and overall psychological well-being resulting from communication, prayer, and numinous intimacy (43-45). These institutions stress civic and community involvement among members and, as a result, have become an integral part of African American culture (46, 47). The characteristics of traditional Black congregations (e.g. energetic choirs, shouting, eccentric preaching styles) are also associated with negative emotional release fostering catharsis and greater willingness to counsel with pastors (48). The frequently conversational prayer, collectivistic congregations, and uplifting R/S expressions are unique to the African American community; and all contribute to the pivotal role of R/S in the lives of African

Americans (49, 50). Therefore, research centered on this population should consider the cultural significance of R/S and its prevailing influence. Prioritization of R/S research among African Americans may engender a greater understanding of the population's health behaviors and outcomes, particularly concerning mental health.

Research has found regional variations of R/S prioritization (i.e. the importance individuals placed on R/S). The Southern United States places higher priority (≥71%) on R/S than other regions, with 82% of the population prioritizing R/S in Mississippi (32). Strong R/S affiliations may be related to Southern demographics. The Southeastern United States has the largest African American population in the country. The population of Mississippi is 37.2% African American and 60.5% White; compared to the national average of 12.9% and 79.6%, respectively (51). Ellison et al. suggests that the salubrious effects of R/S may be more pronounced in the African American community, partially as a result of religious denomination. Researchers found a greater association between Baptist denomination and life satisfaction than other religious affiliations (52). In 2009, The National Survey of Public Life reported that 49% of African Americans are Baptists; while only 4% of the total population classify themselves as Baptists (32, 53). Further, the highest proportion of Baptists resides in the Southern United States (54). Taken together, this research supports further investigation of R/S among in the African American community and suggests that prioritization be placed on the Southern United States.

Data also indicates a difference in R/S by gender (35, 40). In a review of the literature, Rew and Wong revealed that the vast majority (80%) of studies examining R/S involvement found significant gender disparateness. In all reports, women scored higher

on at least one R/S index than men (55). A nationally representative sample of African Americans 55 years or older echoed this trend (46). Women scored higher than men on all religiosity indices included: organizational (church attendance/involvement), non-organizational (prayer, radio), and subjective (beliefs, importance, etc.).

The Role of Religiosity/Spirituality in Public Health

A common source of comfort for fear or anxiety, R/S is considered to act as a form of resiliency, a coping mechanism, or a buffering effect for those who have experienced trauma or ill mental/physical health (35, 47, 56). In a survey of hospitalized patients (n=330), 90% reported R/S as their primary coping mechanism and channel for healing (57). Similarly, Oxman et al. found the six-month mortality of open-heart surgery patients to be significantly lower among individuals who used religious coping (58). Despite its various psychological manifestations, R/S is consistently associated with better social, mental and physical health (29, 30, 55). Koenig et al. found that among medically ill individuals with depression, those who reported high intrinsic R/S had shorter time to remission than those with low intrinsic R/S (59). In a matched case-control study (n=200), Stark investigated the association between mental illness and religiosity; and found a significant, inverse association ($p < 0.01$) (60). The positive effects of R/S have been documented among several illnesses and disabilities including cancer, HIV, heart disease, multiple sclerosis, and burns (27, 61-64). The salutary effect of R/S is widespread and research suggests that its breadth includes reducing all-cause mortality; as well as increased longevity (65). Strawbridge et al. exemplified this risk reduction in a longitudinal study of 28-year mortality rates among Alameda County, CA

adults (n=5,286). Controlling for health status and social connections, the researchers found church attendees had lower mortality rates compared to those who infrequently attended (relative hazard (RH) = 0.69; CI: 0.57- 0.83) (66). Research also suggests those with strong R/S beliefs have higher levels of life satisfaction and perceived quality of life (QOL) compared to the nonspiritual (67, 68). In a convenience sample of Midwestern inpatients (n=216), Riley et al. found that, compared to those with little or no R/S beliefs, the spiritual reported significantly more "social, functional, physical, and emotional well-being" ($p < 0.01$) (29). A large body of research supports the idea that R/S brings an overall sense of psychological well-being and promotes healing, greater perceived control, justification, and growth (31, 58, 64). Research has also demonstrated the positive effect of R/S when operationalized into a health intervention. The available literature demonstrates that R/S interventions have been shown to significantly reduce depression, anxiety, and even Alzheimer's disease among believers (8, 56, 59). As a whole, R/S positively influences the belief, attitudes, behaviors, and ultimately the health of individuals (27, 29, 30, 62-65).

The literature reveals R/S may act as a protective factor for drug use, reducing the risk among both adults and adolescents (35, 56, 70). In a longitudinal study of 7th - 10th graders, Wills et al. discovered that those who reported high intrinsic R/S were less likely to use tobacco, alcohol, and marijuana in the future (35). Additionally, of the 138 articles Koenig reviewed pertaining to substance abuse and R/S, 90% found R/S to be a protective factor for substance use and abuse (56). Research suggests that this relationship may be partly explained by the positive association between alcohol/drug use

disorders and lack of purpose in life; the latter being a central component of spirituality (67, 71).

R/S may reduce the risk of these deleterious behaviors among African Americans. Brown and Gary found that Blacks who attend congregation services consume less alcohol and are less likely to smoke cigarettes than those who infrequently or never attend (72). Upon examination of the National Survey of American Life (NSAL), Chatters et al. discovered that substance use disorders was higher among African Americans who reported infrequent church attendance compared to regular attendees (73). Most notably, in a study of African American students – aged 12-25 years and living in Southeastern United States (n=435) - Nasim et al. found both private and public religiosity to reduce the prevalence of marijuana, alcohol, and tobacco use (74).

Like other anxiety disorders, research has demonstrated that PTSD is inversely associated with R/S (30, 75). Using a computer-based survey, Connor et al. investigated the association of trauma and spirituality among a nationally representative sample of 1,200 U.S. adults and found general spiritual beliefs to be inversely associated with posttraumatic symptom severity ($p < 0.01$) (30). The various benefits/forms of R/S (e.g. resiliency, coping, buffering, etc.), which 'cushion' the effect of illness and injury, is especially relevant to PTSD. A reported 90% of those affected by the 911 terrorist attacks (a PTE) turned to R/S to cope (76). Research shows that devotion to R/S after a traumatic event facilitates posttraumatic growth (PTG), which diminishes psychological trauma of the event (77, 78). Schaefer et al. found R/S to be negatively associated with PTSD severity over time, and to significantly increase PTG ($\geq$ 8 months following trauma) compared to the non-spiritual (78). While evidence of an overall salutary effect is ample,

there is a paucity of research that focuses solely on the relationship between R/S and PTSD. Chen and Koenig conducted a literature review of related articles published between 1872 and 2004; and only found 11 studies – with acceptable psychometric properties - exclusive to PTSD and R/S (75). Often times, PTSD is grouped within a measure of anxiety or mental health and not reported separately. For example, Chatters et al. investigated the effect of religiosity among elderly African Americans (n=837); and reported the protective effects of religiosity on DSM-IV anxiety disorders as a whole (73).

Health and Religiosity/Spirituality among African Americans

Although research has found R/S to be an integral part of African American lives, few studies have focused on this population as a whole; and as a result, there is a dearth of research on PTSD and R/S among African Americans. In a literature review (n=35), Lewis found that only four studies had exclusively Black participants, and of these, none investigated PTSD (79). However, Watlington et al. provided evidence of a relationship with a cohort of domestically assaulted African American women (n=65) who inevitably experienced multiple PTEs. Trend analyses revealed higher religious involvement was correlated with fewer PTSD symptoms ($p < 0.05$) (80). While the research is limited, the small body of evidence that is available suggests the overall influence of R/S is mentally and physically beneficial (72, 73). The benefits to overall health are profound; in a longitudinal study, Bryant and Rakowski found that religious involvement was significantly and inversely associated with mortality among African American elders (81). Hummer et al. further examined this association with the National Health Interview

Survey Multiple Cause of Death data and found that African American adults who never attended Church had about a 2-fold risk of death compared to those who attend weekly services (82). As expected, the effects of R/S transcend to protect the mental health of African Americans. In a community sample of African American men (n=537), Brown and Gary found that religious denomination and frequency of church attendance were significantly and inversely associated with depressive symptoms ($p < 0.05$) (72).

Chatters et al. utilized The National Survey of American Life and found that among African Americans aged 55 years or older (n=837), religious service attendance is negatively associated with the odds of any lifetime DSM-IV mood, anxiety, or substance disorder (OR= 0.86, CI: 0.75-0.98) (73). Further, in a study of Southern Blacks located in an urban city, Brown et al. found that low religious involvement predicted greater psychological distress (83). Data from the NSBA suggests that coping by way of R/S is perhaps more efficacious among Blacks (84). Those who turned to prayer, church, and R/S devotion to cope with personal hardships such as bereavement and illness indicated greater satisfaction than their White counterparts. Koenig et al. reported similar conclusions in a cross-sectional study at Duke University Medical Center (n=812). The researchers found an overall inverse association between R/S and length of hospital stay ($p < 0.05$); but noted that this relationship was more pronounced among African Americans compared to Whites, controlling for demographics ($p < 0.01$) (85).

Potential Mechanisms of Religiosity/Spirituality

Because of its various psychological manifestations (e.g. coping, growth, etc.), the underpinnings of R/S and its effect on health elude researchers. To better understand the

workings of R/S, researchers have attempted to breakdown the construct and underscore associated behaviors and belief systems which may explain its effects. Instead of measuring R/S as a multidimensional construct, some researchers believe there are underlying influences, such as church attendance (or other extrinsic associations) and/or adherence to a specific denomination, that explain the association as a result of social mobilization and healthy lifestyle (86, 87). For example, Levin and Schiller reviewed the literature and found that while denominational affiliation reduced the risk of cause-specific mortality and a multitude of illnesses including multi-site cancers, stroke, and cardiovascular disease; these low risks were strongly associated with behaviorally restrictive religious denominations (Mormons, Orthodox Jews, etc.) (87). Others explain the mechanism to be a result of negative emotional release and positive emotions; and R/S to be the pathway (48, 88). However, critics have countered these notions with support from statistical testing that yielded weak, insignificant associations, indicating a broader, more complex construct is at work. For example, Levin et al. analyzed both organizational and subjective religiosity and their relationship with life satisfaction, controlling for health status. As hypothesized, the relationship remained significant, eliminating the possibility that physical mobility leading to greater religious involvement are the true predictors (89). Walls and Zarit also dispelled explanation of social mediation when examining the impact of R/S among elderly African American church-goers (n=98). The researchers found that although church socialization contributes to well-being, R/S is positively associated with well-being when controlling for social support (45).

Religiosity/Spirituality Measurement

R/S is a multidimensional behavior which is subjectively defined and applied. As a result, research has struggled to pinpoint exactly what components form the construct and how they interact with each other (79). Early work focused solely on the idea of religiousness; in 1972, King and Hunt assessed religiosity by knowledge, church attendance and involvement, and devotion. Just over a decade ago, in 1999, Hill and Hood expanded measurement to include the essential components of both spirituality and mysticism. While these additional dimensions strengthened R/S quantification, in 2001, Koenig et al. recognized the involvement of R/S subjectivity and incorporated R/S importance and self-rating as well as the identification of non-spirituality as meaningful measures (90). Although the literature continues to expand the measurement of R/S, there is no consensus of an operational definition due to its impreciseness and complexity and thus, no comprehensive instrument exists to measure R/S (56). Generally accepted scales incorporate organizational, non-organizational, and subjective components of R/S; and demonstrate strong psychometric properties including reliability, factorial validity, and convergent validity (91). As Rew and Wong noted however, sound R/S measures are not always presented in the literature. In a review of R/S and adolescent behavior (n=43), less than half of the studies reported reliability metrics (n=21); while about 15% reported evidence of validity (n=7) (55). Although research has established spirituality as an essential component to measure along with religiosity, many studies exclude the domain of spirituality altogether. Chatters only examined the influence of religiosity among ethnic groups with The National Survey of American Life (53). Chatters and Levin examined the relationship among African Americans with the National Survey of Black

Americans, which only includes a composite measure of religiosity (46). Koenig et al. developed and popularized the Duke Religion Index (DUREL), a five-item scale that measures organizational (1-item), non-organizational (1-item), and subjective (3-items) religiosity in a clinical setting. However, as with the previously mentioned scales, this instrument fails to account for spirituality and the non-religious (90). While other well-accepted religiosity scales aim to measure one's faith in God (e.g. the Religious Orientation Scale, the Quest Scale, the Religiousness Scale, etc.), spirituality scales encompass both a religious and spiritual domain; and therefore better capture the R/S paradigm (92, 93). There are a handful of spirituality scales that center on well-being (e.g. Spiritual Well-Being Scale of the Functional Assessment of Chronic Wellness Therapy (FACIT-Sp-12), Spirituality Index of Well-being (SIWB), etc.); and although these measurements are validated for health care settings, they are inappropriate for use among the general public (94, 95). These well-being scales measure the health benefits of spirituality in ill populations, and would inaccurately measure spirituality if applied to the general public because only measuring positive attributes of R/S creates inherent bias to the positive affect of spirituality (91). The Spiritual Well-Being Scale (SWBS) is perhaps the most frequently used of these and is designed to measure religious and existential beliefs (96). This instrument was initially developed and standardized with University students but has since been widely utilized for diverse populations (29, 96). However, the SWBS focuses on how R/S relates to QOL instead of measuring the overall experience of R/S. The Spiritual Beliefs Inventory (SBI-15R), developed by Holland et al., incorporates both religious and spiritual domains into the 15-item scale; and while validated with Jewish and German populations, this scale has not been verified among African

Americans (90). The reliability of R/S measurement across populations is a key component of the instrument; and if there is inconsistency or failure to test across groups, as with SBI-15R, the instrument is at a considerable disadvantage. Other spirituality scales marginalize R/S, limiting their ability to capture the experience. One such scale is The Index of Core Spiritual Experiences (INSPIRIT), which focuses on concrete spiritual experiences that have led to the conviction of a higher power (97).

While sophisticated R/S instruments are available, research commonly assesses R/S with one or two-item measures (57, 94, 100). This method prevails due to the lack of consensus on the theoretical framework of R/S but general agreement on select items. For example, research has warranted the use of private and public R/S items acquired from The Religious Support Scale; and Nasim et al. expanded the use of these subscales by drawing two items from each subscale items to assess R/S among African American students (76). However, measuring the multidimensional, complex construct of R/S with one or two items may hinder accurate quantification of R/S and yield inaccurate results (46). Further, one and two-item measures do not account for potential confounding and mediating R/S variables, which can affect estimates of the true association. Exclusively measuring R/S with church attendance may discount other forms of R/S, such as non-organizational and subjective components (46, 99). Solely measuring religiosity by affiliation/denomination is also ineffectual due to the social (events, participation) and physical (i.e. diet, physical health) behaviors expected of adherents (46). Sometimes researchers will develop unique scales that include frequently used R/S items, which are generally validated to use with the study sample (30, 80). However, because these

composite scales are exclusive to the studies they are designed for and vary with regards to R/S items, extrapolation of the results is inappropriate.

The Daily Spiritual Experiences Scale (DSES) was developed to measure ordinary R/S experiences rather than specific religious beliefs (99). Although initially designed for a Judeo-Christian student population, the scale transcends these objectives to capture R/S experiences among various sociodemographic backgrounds (98-100). Use of the DSES has been validated among inmates, alcoholics/drug addicts, and adolescent/elderly populations; as well as with Afghan, Chinese, and African American cohorts (101, 103-107). The DSES is used with a wide range of health outcomes including anxiety, cancer, and general ill health (108-110). Emulating both religiosity and spirituality, the DSES incorporates both dynamics and, as a result, improves R/S quantification and measurement. Measuring daily spiritual experiences - rather than specifying intrinsic (i.e. prayer, readings, etc.) versus extrinsic (e.g. religious participation) or existential and spiritual quality of life - captures an ordinary experience of R/S. The DSES contains essential components of R/S including a subjective component (e.g. “I find strength in my religion or spirituality”); personal, numinous affliction (e.g. “During worship, or at other times when connecting with God, I feel intense joy which lifts me out of my daily concerns”); an overall R/S affect (“I feel deep inner peace or harmony”); and measures of R/S mystery/aspiration (i.e. awe, gratefulness, and compassion for life and nature). The DSES is a 15-item Likert scale that entails two format schemes. The first 14 questions contain six response categories of *many times a day, every day, most days, some days, once in a while,* and *never or almost never* ranging from 1 to 6, respectively. These items are summed together and possible scores range

from 14 to 90, with higher scores indicating lower levels of R/S. The 16th item on the scale ("In general, how close do you feel to God?") contains four response categories: *not close at all, somewhat close, very close,* and *as close as possible*. This item is used in addition to the first 14 or exclusively, as a single R/S indicator (99, 111). Research supports the reliability of DSES; several studies have reported internal consistency estimates (Cronbach's α) in the 0.90s (99-101). With the DSES, researchers have the ability to measure R/S as one construct and operationalize it as a exposure or an outcome variable in statistical testing.

Posttraumatic Stress Disorder Measurement

Researchers at the National Center for Posttraumatic Stress Disorder developed two widely utilized, self-report measures to assess PTSD: the Life Events Checklist (LEC) and the PTSD Checklist-Civilian version (PCL-C). The LEC lists 14 potentially traumatic events (PTEs), and participants are to indicate which (if any) of the events they have ever experienced and what age they were at the time of the event. Listed PTEs include, among others, natural disaster; unanticipated death of a loved one; and sexual/physical/general assault. To ascertain the magnitude of exposure, the LEC includes both an objective and subjective component. The objective component identifies whether the individual has ever been exposed to a PTE, while the subjective component determines whether there was a related emotional response, required for PTSD diagnosis (112). These LEC components assess Criterion A for PTSD diagnosis. The LEC is a highly esteemed PTSD measure, which research has demonstrated to be both reliable and valid in clinical settings (112, 113). Gray et al. found significant reliability of the total

scale ($r > 0.60$, $p < 0.01$) and validity of all seven items ($r > 0.60$, $p < 0.01$) among college undergraduates (n=108) (112).

The PCL-C is a 17-item scale that assesses PTSD criteria B, C, and D, as outlined in the DSM-IV. The items are assessed using a 5-point Likert scale, with responses ranging from *not at all* to *extremely*. Items assess symptoms of re-experiencing, persistent avoidance, and hyperarousal in the past month (114). The validity of the PCL-C has been demonstrated in both military and civilian populations (115, 116). When comparing the validity of the PCL-C with the Clinician Administered PTSD Scale (CAPS) - considered in the field as the 'gold standard' – the two scales were comparable ($r = 0.93$, $p < 0.01$). The internal consistency coefficient (Cronbach's alpha) for the total scale was 0.939. The internal consistency for Criterion B, C, and D also validated the PCL-C; corresponding alphas were 0.935, 0.820, and 0.839, respectively (114). Ruggiero et al. demonstrated strong internal consistency ($\alpha = 0.940$) of The PCL-C among a sample of college students. The researchers recommend an *a priori* cut-off of 44 to diagnose PTSD for maximized diagnostic efficiency (114).

Rationale for Thesis

Prior research has focused on the protective nature of R/S among vulnerable populations (e.g. the elderly, handicapped, and terminally ill); and while R/S is empirically recognized as a protective factor against trauma, research of the association between R/S and PTSD is limited (62, 73). Current research provides evidence of a relationship between R/S and components of PTSD such as PTG and posttraumatic symptoms; however, evidence between the two target constructs is lacking (30, 76, 79,

80). In addition, research has documented the prevalence of trauma and PTSD with national representative surveys but few have examined the rates among urban, young adults in higher education (12, 30). This is especially true among those most strongly influenced by R/S, African Americans in the South (80). Negative affect from a PTE is more often experienced by Blacks than Whites, heightening the possibility of PTSD development. Yet, the only research that demonstrated a relationship between PTSD and posttraumatic symptom severity, was specific to African American women of domestic violence (80). Calhoun screened students attending a large Southeastern University for posttraumatic experiences but the sample was overrepresented by Whites (80%) (76). This study aims to investigate the association between R/S and PTSD among Southern African Americans in higher education.

While diagnosis of PTSD is standardized with the DSM-IV, R/S measurement varies, which creates a gap in the research. Many times spirituality is excluded in measurement, or only one or two-item measures are used, restricting the breadth of R/S (46, 55, 94). No published study to date has measured R/S as one construct in the Southern, African American community.

METHODS

Purpose

The primary purpose of this study is to investigate the relationship between R/S (the main exposure variable) and PTSD (the outcome variable) among African American undergraduate college students at Jackson State University, Mississippi. Secondary goals are to 1) identify R/S differences between those who only meet A criterion for PTSD and those who meet all four criteria, resulting in PTSD diagnosis; 2) determine whether R/S is associated with marijuana and alcohol use; and 3) whether PTSD mediates the association between R/S and marijuana/alcohol use.

The secondary goals of this thesis will identify significant differences between partial and full PTSD and may help to further explain why some succumb to anxiety disorder and others do not. Further, exploring this relationship among an exclusively Black population at a Southeastern University will lay the groundwork for civilian PTSD, drug/alcohol use, and R/S as it pertains to urban, African American students.

Hypotheses

1. There is an inverse relationship between R/S and PTSD among African American students at Jackson State University.
2. Those who only meet Criterion A for PTSD score significantly higher on the R/S index compared to those with PTSD diagnosis.
3. Relationships among sociodemographic variables are expected to agree with the literature. More women meet Criterion A and PTSD diagnosis than their male counterparts. Younger age cohorts (<25 years) to score higher on Criterion A measurement and meet diagnosis for PTSD than older age cohorts. Lastly, students who have moderate household incomes are less likely to suffer from PTSD than low-income students.

4. PTSD is a mediator between R/S and drugs/alcohols when considering marijuana and alcohol use as the outcome variable.

Study Design

The current study is a secondary analysis of data obtained from the Clinical Psychology Department at Jackson State University, Mississippi. Data from the original, cross-sectional study was collected in March and April of 2010. A total of 272 African American undergraduate students were recruited into the study by convenience sampling. Eight Professors, who teach *Introduction to Psychology* at the University, were contacted and six agreed to participate. The Professors offered their students an incentive of extra credit for survey participation. Every student from 10 separate Psychology classes (the number of classes taught by the eight Professors) agreed to participate. Participants (ages 18-66) completed a questionnaire that included sections on sociodemographic information, drug use/abuse, emotion regulation, self-esteem, coping/self-efficacy, perceived social support, HIV-risk; and the LEC, PCL-C, and DSES instruments. This analysis focused on data from the sociodemographic and LEC, PCL-C, and DSES sections.

Study Participants

For this analysis, only participants who identified as African American/Black were included. With this restriction, 22.4% of the original participants (n=272) were excluded, leaving 211 subjects. Individuals with incomplete responses to the DSES, LEC, or PCL-C (n=39; 18.5%) were also excluded. Subjects were included with missing values

to the supplementary R/S items (i.e. religious denomination (one missing value), religious participation (three missing values), and the last item of the DSES (four missing values)) because very few values were missing and these items come secondary to the main exposure variable. After these considerations, 175 participants were included in the analysis.

Variable Selection

As previously noted, R/S is believed to be a multidimensional concept that includes components of self-directed purpose, and religiosity (i.e. organizational, non-organizational, and subjective). For this reason, the summed values of the first 14 items on the DSES (FIRST14) was the main exposure variable.

The primary outcome variable - PTSD status (Y/N) - and the secondary outcome variable – full versus partial PTSD - were assessed with the LEC and PCL-C; validated instruments that follow the DSM-IV guidelines to PTSD diagnosis (110-112, 114). Participants who reported at least one PTE and answered "Yes" to feeling helplessness, fear, or horror at the time of the PTE met Criterion A for PTSD diagnosis, representing partial PTSD. If Criterion A was met, scores for Criteria B, C, and D were then summed and those who scored a 44 or higher met diagnosis criteria for full PTSD. Internal consistency in the present study population was strong ($\alpha = 0.940$). High prevalence of PTSD prevalence was affirmed in the original sample; 44 participants (40.7%) scored 44 or above on the PCL-C, indicating that they met criteria for PTSD (145).

Religious denomination ("Baptist" versus "Other"), religious participation, and the 15th item of the DSES (i.e. "In general, how close do you feel to God?") were

secondary R/S items regressed on PTSD status, in an effort to identify R/S indicator variations. Two variables were included to assess marijuana and alcohol use in the past year. Responses were measured on a 6-point Likert scale with response categories *never, one time, monthly or less, 2-4 times a month, 2-3 times a week,* and *4 or more times a week.*

Marijuana and alcohol abuse/dependence in the past year was assessed with a composite score of seven questions. Questions measured interference ("How often have you failed to do what was expected…"), guilt, memory, withdrawal, injury, and intervention ("Has anyone been concerned about your drug use…") associated with marijuana/alcohol use; and were measured on a 5-point Likert scale with values 1) *never,* 2) *less than monthly,* 3) *monthly,* 4) *weekly,* and 5) *daily or almost daily.* However, this variable was ultimately excluded because the highest potential score was 32, yet the mean response score was 0.689, indicating that the vast majority of subjects answered *never* to all questions.

The sociodemographic variables included were gender, age, income, and family type (e.g. both parents, single parent, etc.). Altogether, there were 12 variables selected for analysis. While all of these variables were continuous in the original dataset, they were transformed into categorical variables to analyze with logistic regression. Household income quintiles ("$0-24,999;" "$25,000-$50,000;" and ">$50,000") are based on U.S. Census distributions (115). Age quintiles ("18-21," "22-25," and "26+") were calculated based on distribution of the sample. Because so few subjects reported family type as "Adopted," "Extended," "Other," or "Single Father;" the variable was dichotomized as 1=Single parent and 0=Both parents. Because so few subjects used

marijuana and alcohol in the past year, these two variables were dichotomized as 1=Ever and 0=Never. The study participants reported to be highly religious/spiritual; over 65% only answered the DSES instrument with 1 (*Many times a day*) and 2 (*Everyday*). The highest summed score was 71, from a possible score of 84. Therefore, I dichotomized the main exposure variable, DSES (i.e. the sum of the first 14 items), as 1=14-28 and 0=>28. Religious denomination was dichotomized as 1=Baptist and 0=Other. The original questionnaire included specific denominations (i.e. Muslim, Protestant, Catholic, Methodist, Atheist, and Lutheran), however, only 19 subjects identified as one of these denominations; while no one reported to be Atheist or Lutheran. These 19 subjects were grouped with those who identified as "Other." Because about 50% of the sample reported to frequent church weekly or more, the variable "frequency" was dichotomized as 1=Weekly or more and 0=Less than weekly. About 75% of the sample answered the 15th DSES item ("In general, how close do you feel to God?") as *very close* or *as close as possible*, the variable was dichotomized as 1=Close and 0=Not close. I also examined the distribution of the aforementioned variables by PTSD status (Y/N) and full PTSD vs. partial PTSD.

Potential Confounding Variables

Several exposure variables were also examined as potential confounders. These include household income, age, gender, family type, alcohol use, and marijuana use. Previous research shows that income, age, gender, alcohol use, and marijuana use are all associated with R/S and PTSD (1-3, 13, 23, 35). Family type will be examined as a confounder due to its association with other commonly cited confounders (e.g. income,

job, etc.). Household income estimates may not be indicative of student income level without accounting for number of household members. However, because income is presented in the literature as a confounder, it will be examined as such in this study.

Statistical Analysis

An exploratory data analysis was performed on the all exposure variables and the outcome variables to determine distribution of the study population. Wald Chi-Square statistics were calculated to ascertain overall, crude associations between the exposure variables and three levels of PTSD; full, partial, and none. Prevalence odds ratios were also calculated for crude associations between exposure variables and the two outcome variables. The R/S indicators were also regressed on PTSD status to determine differences from the main exposure variable (FIRST14).

Potential confounding variables that had statistically significant crude associations with the outcome were regressed on the main exposure variable to determine whether there is a relationship. Exposure variables that were included in final model considerations were significantly associated with one or both of the outcome variables (PTSD status), assessed by stepwise selection using logistic regression. Stepwise selection identifies variables statistically significant with the outcome variable at $\alpha=0.05$ and drops variables that lose significance with each additional variable added to the model. This analysis identifies exposure variables as well as superfluous variables (i.e. potential confounders), and ultimately selects the most parsimonious model.

To assess the relationship between marijuana and alcohol use and R/S, the drug use variables were regressed on R/S indicators. Eight separate logistic regressions were used to ascertain this relationship with frequencies and Wald Chi-Square statistics.

To determine whether PTSD mediates the association between R/S and marijuana and alcohol use, crude estimates of the exposure, marijuana/alcohol use, and PTSD status were examined. The same regression was performed between the mediating variable (PTSD status) and R/S indicators.

All statistical analyses were performed using SAS (version 9.2) and the study protocol was approved by the Emory University Institutional Review Board.

RESULTS

Table 1 displays the distribution of sociodemographic and drug use characteristics of the study population. While the majority of students were ages 18 to 25 (77.1%), almost 25% were 26 years or older, indicating students often return to higher education years after graduating high school. Almost half (41.1%) of the participants were raised in single parent homes. Drug and alcohol use was infrequent with the study population. Over 75% of the study sample reportedly smoked marijuana one time or never, in the past year. 30% of students drank alcohol one time or never in the past year, while the greatest percentage of students (32.9%) drank monthly or less.

Table 2 presents the distribution of R/S and PTSD characteristics of the population. The participants reported very strong R/S beliefs, and this led to the dichotomization of these variables, as previously stated. Further, of 175 total participants, 120 subjects identified as Baptist and about 50% frequented church once a week or more. There was a high prevalence of PTSD within this population; 53.7% of study population met criterion for partial PTSD and 18.3% met criteria for full PTSD diagnosis.

Table 3 displays the frequency of exposure variables for the outcome PTSD (full, partial, and none) and Wald Chi-Square statistics for crude associations. While more women met diagnosis for partial and full PTSD than men, this was not significant. Individuals who reported a household income of $0-$24,999 met partial and full PTSD diagnosis more than individuals with higher household incomes; however, this association was also not statistically significant at the 0.05 significance level. Further, because 27% of the sample had missing values for income, this variable would not be included in the final model due to reliability considerations. The only exposure variables

significantly associated with PTSD outcomes were FIRST14, ITEM15, and denomination. Identifying as Baptist was the only protective factor for PTSD (Y/N) and ITEM15 was the only protective factor for PTSD (full vs. partial), which are consistent with the literature. In this study population, scoring high on the main exposure, FIRST14, was a risk factor for full PTSD. While subjects dichotomized on FIRST14 had similar numbers of partial PTSD, more than twice as many subjects who reported high levels of R/S met criteria for full PTSD, compared to those who reported moderate or low levels of R/S (22 and 9, respectively).

Table 4 illustrates crude associations by providing odds ratios. ITEM15 was not significant with the dichotomized outcome variable, PTSD (Y/N); but alcohol, the middle age group, and the two R/S indicators – FIRST14 and denomination - were. The odds of subjects ages 22-25 meeting full or partial PTSD was about 2.5 times greater than the odds of individuals 18-21 meeting full or partial PTSD diagnosis (CIs: 1.022-6.912; 1.070-7.768, respectively). FIRST14 was significantly associated with PTSD status (Y/N) but not PTSD (full vs. partial). The odds of students with strong R/S beliefs (with FIRST14) meeting full PTSD (vs. no PTSD) are more than 4 times greater than students with moderate or low R/S beliefs meeting PTSD diagnosis (CI: 1.682-10.344). The only variables significantly associated with PTSD status (full vs. partial) were middle age group and ITEM15. The odds of students who reported a close relationship with God and met full PTSD criteria (vs. partial) were about two-thirds less than the odds of students who reported a more distant relationship and met full PTSD.

To ascertain whether any of the significantly associated variables (other than the main exposure variable) acted as confounders, the two variables which were associated

with one or both of the PTSD outcomes (alcohol and age) were regressed on the main exposure variable (FIRST14). Because neither of these variables was significantly associated with FIRST14 at the 0.05 significance level, they were not considered to be confounders (Table 5).

Tables 6 illustrates the final models representing the association between the dependent and independent variables. Stepwise selection with logistic regression was performed at the $\alpha = 0.05$ significance level with both PTSD outcomes, separately. FIRST14, ITEM15, and alcohol remained as statistically significant exposures ($p < 0.05$) with PTSD diagnosis (Y/N) as the outcome variable. The odds of students with strong R/S beliefs meeting PTSD are over 12 times the odds of students with moderate or low R/S beliefs (CI: 2.93-50.98). Students who reported a close relationship with God are 87% less likely to meet criteria for PTSD than students who reported a weaker relationship with God (CI: 0.03-0.54). Additionally, students who ever consumed alcohol in the past year were 5.3 times more likely to meet PTSD diagnosis than students who did not consume alcohol or did only once in the past year (CI: 1.35-21.15). Regarding PTSD full vs. partial as the outcome; FIRST14, ITEM15, and the middle age group (22-25) remained as exposures ($p < 0.05$). Results for the association between R/S indicators (FIRST14 and ITEM15) and full vs. partial PTSD mirror results of full PTSD diagnosis (Y/N) as the outcome, indicating that strong R/S beliefs is a risk factor for full PTSD, while a strong relationship with God is protective. In addition to these exposures, students ages 22-25 were about 4 times more likely to meet full PTSD diagnosis - compared to partial PTSD - than individuals ages 18-21 (CI: 1.46-11.32).

The association between drug use and R/S indicators was measured using Wald Chi-Square statistics to determine whether a relationship existed. There were no associations were significant at the $\alpha=0.05$ significance level. Thus, further investigation of PTSD as a mediator was unwarranted.

DISCUSSION

In this study, the multidimensional measurement of R/S was positively associated with PTSD diagnosis; while the 15th item of the DSES ("In general, how close do you feel to God?") was negatively associated with full PTSD. Perhaps the subjective component of R/S (measured with item 15) is more relevant to the well-being of African American Baptists than other dimensions. Ever drinking alcohol in the past year and ages 22-25 were other significant risk factors for PTSD. While ages 22-25 are at greater risk for full PTSD than for partial PTSD, the occurrence of PTSD and partial PTSD does not differ with regards to alcohol consumption, as it does for full versus no PTSD. The only exposure variable identified as a protective factor for PTSD was strong subjective R/S ("In general, how close do you feel to God?"). No potential confounders were included in the final model. Marijuana and alcohol use variables were not statistically associated with R/S indicators or PTSD, therefore, PTSD did not mediate the relationship between R/S and alcohol/marijuana use.

Contrary to previous reports, and my hypothesis, results indicate that R/S (as quantified by the first 14 items on the DSES) is positively associated with PTSD diagnosis. However, an inverse relationship was found for the 15th DSES item ("In general, how close do you feel to God?"), which is consistent with the literature (52, 78). Research validates the use of the first 14 items *or* the last item of the DSES as effective quantifiers of R/S, however, the 15th item represents a subjective component of R/S, while the first 14 items represent other dimensions of R/S (i.e. personal affliction, mystery/awe, and an overall affect) (97, 109). This may explain the discordance between

the measures within this population. Another explanation of this inconsistency is the reverse coding of item 15 compared to the first 14 items of the DSES. Low FIRST14 scores indicate strong R/S, while low ITEM15 scores indicate a weak relationship with God. If students were in a hurry to leave class and rushed through the questionnaire, there is the possibility that the reverse coding went unnoticed. Although research indicates that Baptist denomination is associated with greater life satisfaction, this association was not examined among a population with a high prevalence of partial and full PTSD (52). If PTEs are widespread in this population, perhaps the population feels less inclined to seek help and, instead, internalize the experience. Further, while the literature documents historically Black congregations as motivating negative emotional release and positive energy through uplifting sermons and strong social relationships, it is unclear whether this largely Baptist population attended predominantly Black congregations (48, 49). In addition, it is possible that the nature of Baptist congregations (whether historically Black or not) in Mississippi differ from what is nationally represented. Because Mississippi is a very socially conservative state, sharing PTEs of sexual or physical assault may be considered taboo and individuals risk ostracization if these experiences were to be communicated.

Similar to previous research and confirming my secondary hypotheses, this study found alcohol consumption and ages 22-25 to be associated with PTSD diagnosis (4, 11). However, my hypothesis of these relationships is only partly correct. Individuals ages 18-21 were not at increased risk of PTSD diagnosis. Nevertheless, research suggests individuals in this younger age group experience more traumatic events than older age groups; but not necessarily a higher prevalence of PTSD (1). My results support the

findings of Kessler et al., who reported that the median onset of PTSD is 23 years (11). I expected alcohol and drug use to be associated with the R/S measures as reported in the literature, but in fact, there was no relationship (73, 89). Because this study population reported strong R/S and very little drug use, it is possible that the lack of diversity within the sample provided unreliable estimates of the relationship. The vast majority of the sample was highly religious/spiritual; less than half the sample reported even moderate levels of R/S. Additionally, the significance of drinking alcohol and smoking marijuana monthly and drinking and smoking multiple times per week differ greatly but these two groups were combined due to the small cell frequencies.

My prediction that gender would be significantly associated with PTSD was incorrect. Perhaps gender was not statistically associated with PTSD in this sample because of a common disturbance class (i.e. severity of PTE), as Chung and Breslau suggested (19). If both men and women were exposed to similar rates of assaultive violence, or lack thereof, gender may not be predictive of PTSD status. Contrary to previous reports, women were not more likely than men to score high on R/S indices (54, 63). This suggests that R/S is ubiquitous among African Americans in Mississippi, regardless of gender.

Although I hypothesized income to be significantly associated with PTSD, information about household size was missing; therefore, it is not surprising that significance was not found. The relevance of estimated household income is dependent on family size; what is low, medium, and high cannot be determined without knowledge of how many household members are supported by the estimated income. Further, students generally have a low income or no income because while in school, they are

unemployed. Matriculation towards a degree is their job at the time and income tends to come solely from family or loans. The number of missing values for this variable (n=47) also suggests students found the question irrelevant and as a result, left the question unanswered.

Weaknesses

There were at least five weaknesses associated with this analysis. First and foremost, the sample size was small (n=175), resulting in a small frequency of PTSD diagnosis (n=32) and possibly compromising statistical significance. While Fisher's exact testing can better capture the relationship with small cell frequencies with logistic regression, the rule of thumb is to only refer to these estimates when the expected cell count is five or less in one or more cells. With this study, some expected cell counts were less than 10 but not as low as five. Using Fisher's exact testing would have provided less reliable estimates. The small sample sizes are also apparent with the wide confidence intervals, suggesting the estimates of effect are imprecise and provide less information than a larger sample would. The second disadvantage of the small cell counts is the forced grouping of variable levels that have separate meanings. This is the case with the drug use variable and the R/S indicators. For example, answering the majority of DSES questions as *most days* and *never or almost never* is quite different, but these two categories were grouped together due to the small cell counts. Similarly, identifying as *Catholic* or *Muslim* may alter the relationship between R/S and PTSD but again, the small cell frequencies prevented other denominations from being represented and compared. Additionally, there was little R/S diversity within the sample, which also

drove the grouping of dissimilar levels of the independent variables, and may have provided inaccurate estimates of effect.

The third limitation of this study is that it is cross-sectional in nature. With this study design, making statements of directionality is not possible. This study cannot determine – as a longitudinal cohort could - whether those who are religious/spiritual (as measured by FIRST14) are at an increased risk of PTSD diagnosis or whether those who suffer from PTSD seek out R/S to better cope with their illness.

A fourth limitation is that residence of participants was not included on the questionnaire and as a result, could not be investigated as a potential confounder. This study assumed students to reside in an urban setting due to the location of Jackson State University. However, the living environment of students may have greatly differed depending on whether they lived on campus or off campus. For those who lived off campus, residing in an urban area versus a rural or suburban area may be related to the main exposure and outcome.

The fifth and final limitation of this study is that because the sample was obtained using convenience sampling, it is possible that students taking *Introduction to Psychology* differ from the general student body at Jackson State University. Further, these results cannot be generalized or extrapolated to include all Southerners, African Americans, or students due to the sample size and study inclusions/exclusions. This study was introduced as a stepping stone to future investigators and results should only be applied to the population examined.

Strengths

There are at least three strengths of this study. First, this is the only study that has examined the relationship between R/S and PTSD among Southern, Black students. Secondly, differences between full PTSD and partial PTSD were examined, which provides more information about what factors differentiate the two. A third strength is measurement of the main exposure and outcome variables. The dependent variable, PTSD, was measured with instruments considered to be the "gold standard" in the field. The questionnaires assessed PTSD criteria outlined in the DSM-IV, a diagnostic tool for health care professionals (110-112, 114). The main exposure measurement, the DSES, is also considered reliable and has been validated among comparable populations (105).

Conclusion

This thesis provides groundwork for future research on the relationship between R/S and PTSD. Future research should be longitudinal in nature with large sample sizes to accurately measure effect estimates. Because participants in this study lack diversity and may not be representative of Black Southerners in the community, future research should examine this population outside of an academic setting. Additionally, research should examine whether all DSES items accurately measure R/S and pertain to African American Baptists. With greater knowledge of religion/spirituality's role among African Americans and how it relates to PTSD, future public health interventions can be tailored to acknowledge and incorporate R/S to better serve the African American community; especially those at risk for PTSD development.

Table 1. Demographic and Drug Use Characteristics of Study Participants, n=175	
Characteristic	N (%)
Age (years)	
18-21	65(37.1)
22-25	70(40.0)
26+	40(22.9)
Gender	
Male	55(31.4)
Female	120(68.6)
Family Type	
Both Parents	92(52.6)
Single Parent	72(41.1)
Missing	11 (6.29)
Income (annual)	
$0 - $24,999	58(45.3)
$25,000 - $50,000	38(29.7)
>$50,000	32(25.0)
Missing	47(27.0)
Marijuana Use in Past Year	
Never	109 (63)
One Time	24 (13.9)
≤ Monthly	15 (8.7)
2-4/mo	7 (4.1)
2-3/wk	6 (3.5)
≥ 4/wk	12 (6.9)
Alcohol Use in Past Year	
Never	25 (14.7)
One Time	27 (15.9)
≤ Monthly	56 (32.9)
2-4/mo	48 (28.2)
2-3/wk	8 (4.7)
≥ 4/wk	6 (3.5)

Table 2. R/S and PTSD Characteristics of Study Participants, n=175

Characteristic	N (%)
First 14 items of the DSES	
Answered "Many times a day" or "everyday" only	117 (67.6)
Answered "Most days," "Some days," "Once in a while," or "Never or almost never"	56 (32.4)
"In general, how close do you feel to God?"	
Not close at all	5 (2.9)
Somewhat close	40 (23.4)
Very close	86 (50.3)
As close as possible	40 (23.4)
Denomination	
Baptist	120 (69.8)
Other	52 (30.2)
Church Attendance	
> 1/wk	24 (13.8)
1/wk	62 (35.6)
2-3/mo	43 (24.7)
2-3/yr	34 (19.5)
Never	11 (6.3)
PTSD Status	
Full PTSD*	32 (18.3)
Partial PTSD**	94 (53.7)
No Criteria Met	49 (28)

* Full PTSD is meeting criteria A, B, C, D

** Partial PTSD is meeting criteria A

Table 3. Frequencies and Wald Chi-Square Statistics of PTSD Status and Sample Characteristics, n=175

Characteristic		Full PTSD n=32	Partial PTSD n=95	No PTSD n=49	X^2	*P*-Value
Age						
	18-21	7	37	21	6.13	0.190
	22-25	18	33	19		
	26+	7	24	9		
Gender						
	Male	7	27	21	4.59	0.101
	Female	25	67	28		
Family Type						
	Both Parents	13	55	24	2.27	0.322
	Single Parent	15	35	22		
Income						
	$0-$24,999	10	36	12	1.96	0.744
	$25,000-$50,000	4	24	10		
	>$50,000	7	18	7		
Marijuana use						
	Ever	15	33	16	2.17	0.339
	Never	16	60	33		
Alcohol use						
	Ever	25	65	28	5.12	0.078
	Never	5	28	19		
FIRST14[a]						
	14-28	22	48	16	11.10	**0.004**
	>28	9	46	32		
ITEM15[b]						
	Close	20	77	29	10.52	**0.005**
	Not close	11	15	19		
Denomination						
	Baptist	17	61	42	11.01	**0.004**
	Other	15	30	7		
Church attendance						
	Weekly or more	21	69	39	2.52	0.284
	< Weekly	11	25	9		

[a] Sum of the first 14 items of the DSES

[b] The 15th item of the DSES ("In general, how close do you feel to God?")

P-values in bold indicate that the association is significant at $\alpha=0.05$

Table 4. Frequencies and Crude Odds of PTSD Status and Independent Variables, n=175

Characteristic		Full PTSD=1 No PTSD=0 with 95% CI	Full PTSD=1 Partial PTSD=0 with 95% CI
Age			
	18-21	Referent	Referent
	22-25	**2.66 (1.02-6.91)**	**2.88 (1.07-7.77)**
	26+	1.76 (0.57-5.45)	1.54 (0.48-4.95)
Gender			
	Male	Referent	Referent
	Female	2.15 (0.83-5.59)	1.44 (0.56-3.72)
Family Type			
	Both Parents	Referent	Referent
	Single Parent	1.47 (0.64-3.36)	1.81 (0.77-4.26)
Income			
	$0-$24,999	2.94 (0.71-17.55)	1.79 (0.45, 8.71)
	$25,000-$50,000	Referent	Referent
	>$50,000	3.95 (0.80, 26.08)	2.79 (0.60-15.16)
Marijuana use			
	Ever	1.63 (0.74-3.61)	1.71 (0.75-3.88)
	Never	Referent	Referent
Alcohol use			
	Ever	**3.23 (1.06-9.80)**	2.15 (0.75-6.20)
	Never	Referent	Referent
FIRST14*			
	14-28	**4.17 (1.68-10.34)**	2.33 (0.91-6.38)
	>28	Referent	Referent
ITEM15**			
	Close	0.80 (0.32-2.18)	**0.35 (0.14-0.89)**
	Not close	Referent	Referent
Denomination			
	Baptist	**0.45 (0.20-1.00)**	0.56 (0.23-1.38)
	Other	Referent	Referent
Church attendance			
	Weekly or more	0.57 (0.25-1.30)	0.69 (0.29-1.64)
	< Weekly	Referent	Referent

* Sum of the first 14 items of the DSES

** The 15th item of the DSES ("In general, how close do you feel to God?")

Odds ratios and confidence intervals in bold indicate that the association is significant at α=0.05

Table 5. Crude Odds of Potential Confounding Variables and Main Exposure

Variable		**FIRST14**	**95% CI**
AGE			
	18-21	Referent	
	22-25	1.31	0.67-2.57
	26+	1.17	0.52-2.60
ALCOHOL USE			
	Ever	0.85	0.44-1.64
	Never	Referent	

Table 6. Final Models of the Association between R/S and PTSD Outcomes

	Model 1*	Odds Ratio	95% CI
PTSD (Y/N)	FIRST14	12.212	(2.925-50.980)
	ITEM15	0.135	(0.034-0.544)
	ALCOHOL	5.338	(1.347-21.149
FULL VS. PARTIAL PTSD	FIRST14	10.107	(2.057-49.670)
	ITEM15	0.054	(0.011-0.281)
	Age**	4.071	(1.463-11.324)

* Includes variables that remained in stepwise selection at $\alpha=0.05$

**Age group 22-25

Table 7. Frequencies and Wald Chi-Square Statistics for R/S Variables and Marijuana/Alcohol Use

Variable	Marijuana=1	Marijuana=0	X^2 P-value	Alcohol=1	Alcohol=0	X^2 P-value
FIRST14						
14-28	31 (49.2%)	54 (49.5%)	0.002	56 (47.9%)	27 (51.9%)	0.237
>28	32 (50.8%)	55 (50.5%)	0.966	61 (62.1%)	25 (48.1%)	0.626
ITEM15						
Close	42 (68.9%)	82 (75.9%)	0.998	86 (73.5%)	35 (71.4%)	0.075
Not close	19 (31.2%)	26 (24.1%)	0.318	31 (26.5%)	14 (28.6%)	0.784
FREQUENCY						
Weekly or more	43 (67.2%)	85 (78.7%)	2.800	35 (29.7%)	42 (82.4%)	2.669
< Weekly	21 (32.8%)	23 (21.3%)	0.094	83 (70.3%)	9 (17.7%)	0.102
DENOMINATION						
Baptist	47 (73.4%)	73 (68.9%)	0.405	81 (70.4%)	37 (71.2%)	0.009
Other	17 (26.6%)	33 (31.1%)	0.525	34 (29.6%)	15 (28.9%)	0.925

Marijuana=1 means the individual used at least once in past year
Marijuana=0 means the individual did not use in the past year
Alcohol=1 means the individual drank alcohol once or never in the past year
Alcohol=0 means the individual drank alcohol more than once in the past year

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