THE INFLUENCE OF EXTRAVERSION, RELIGIOSITY, AND SPIRITUALITY

ON HEALTH BEHAVIORS

Elizabeth P. Jenkins

Thesis Prepared for the Degree of

MASTER OF SCIENCE

UNIVERSITY OF NORTH TEXAS

May 2013

APPROVED:

Joseph W. Critelli, Major Professor
John Ruiz, Committee Member
Adriel Boals, Committee Member
Vicki Campbell, Chair of the
     Department of Psychology
Mark Wardell, Dean of the Toulouse
     Graduate School

Jenkins, Elizabeth P. <u>The Influence of Extraversion, Religiosity, and Spirituality on Health Behaviors</u>. Master of Science (Psychology), May 2013, 75 pp., 15 tables, 1 illustration, references, 106 titles.

Religion and spirituality are thought to be of great importance for the meaning and quality of life for many individuals, and research suggests that there may be important health benefits associated with religion and spirituality. Religion and spirituality should be related to health behaviors for a number of reasons. Health behaviors are important contributors to an individual's overall health, illness and mortality. Major negative health behaviors related to health outcomes are smoking, excessive alcohol consumption, obesity, risky driving, and high risk sexual behaviors. Health behaviors may also be linked to personality traits. The key trait examined for this study was extraversion. It includes adjectives such as being active, assertive, energetic, outgoing, and talkative. In this thesis, I take several hypotheses and explore the influence of extraversion, religiosity, and spirituality on health behaviors.

THE INFLUENCE OF EXTRAVERSION, RELIGIOSITY, AND SPIRITUALITY ON

HEALTH BEHAVIORS

While religion and spirituality are distinctive in some ways, their similar

characteristics often make it difficult to separate these constructs. Religiosity, or the

extent to which a person is religious, is a more narrowly defined concept than

spirituality, as it refers to public behaviors usually manifested in a religious institution,

such as a church, mosque, or temple (Westgate, 1996). Johnstone (2004) defines

religiosity as a system of beliefs and practices by which a group of people interpret and

respond to what they feel is sacred and supernatural. Spirituality is a more broad

measure of faith. Gill et al. (2010) refer to it as "an awareness of a being or force that

transcends the material aspects of life and gives a deep sense of wholeness or

connectedness to the universe" (p. 293). It is a more private way of feeling one's faith,

and is typically less publically expressed. Religious individuals are spiritual in a sense,

and spirituality can be religious or non-religious (Chandler, Holden & Kolander, 1992).

Two of the most pronounced similarities between religion and spirituality are the

shared belief in a higher power and prayer. Belief in a higher power is the most central

shared belief, but in religion that higher power is personified as God or as multiple gods.

The type of prayer may be traditional or more meditative in spirituality. "Meditative

prayer" is a term used to describe a style of praying where one feels the presence of

God, spends time thinking about God, and is overall reflective (Francis & Robbins,

2008). This is very similar to religious prayer, but not all meditation is directed at a

specific being.

The differences between religion and spirituality are what make some spiritual

individuals non- religious. One of the biggest overall separations between the two is the general presence of order and rules that occur in religion, but not spirituality. Religion is very organized, with scheduled meetings for worship, institutions for which to meet at and rules or commandments to follow. Spiritual individuals typically do not practice their beliefs at specific times, or participate in being spiritual with others, or follow any specific rules. Organized religions also follow a set body of beliefs, while spiritualists have no written guide to lead them in their faith. Spirituality lacks order, while organization is fundamental to most religions.

Another difference includes the practices that religious individuals participate in as opposed to those of non-religious spiritualists. Singing hymns, taking communion, and saying aloud congregational prayers are only a few of the religious rituals. Without an institution, other individuals to practice with, or regularly scheduled times for practice, those who choose a spiritual, non-religious path have less opportunity to practice their faith and perform specific rituals.

Correlations between religiosity and spirituality have not been analyzed using the constructs as a whole, due to the varying definitions and understanding of each concept. One study found through content analysis that religion and spirituality shared nine common characteristics: experiences of connectedness or relationship, concern with existential issues or questions, processes leading to increased connectedness, attempts at or capacities for transcendence, behavioral responses to something sacred or secular, beliefs in the sacred, transcendent, etc, systems of thought or sets of beliefs, pleasurable states of being, and traditional institutional or organizational structures (Hill, Pargament, Hood, McCullough, Swyers, Larson, & Zinnbauer, 2000). Additional studies

have noted these constructs as mutually distinct (Saroglou and Munoz-Garcia, 2008; Zinnbauer and Pargament, 2005; Miller, 1999). After reviewing these and other studies, there is support for examining the constructs as separate belief systems.

Religiosity

The belief in an after-life is one of the defining characteristics of religion. Religious behavior has been traced back to Neanderthal practices of burying their dead with weapons, tools, and clothing. This shows that they were likely thinking about the after-life and what lies beyond (Newberg, D'Aquili, and Rause, 2001). Another ancient culture that showed signs of early religious behavior was the Egyptians. The Egyptians saw death as a transitional stage in the progress to a better life in the next world. Furniture, carved statues, games, food, and other items useful to the next life were prepared to be buried with the mummy (St. Petersburg Times, 1999). A number of studies have indicated that religiosity is related to belief in an afterlife (Dezutter, Soenens, Luyckx, Bruyneel, Vansteenkiste, Duriez, & Hutsebaut, 2009). An extension of this notion is that in a sample of Episcopal parishioners, belief in an afterlife was negatively correlated with death anxiety (Harding, Flannelly, Weaver, & Costa, 2005).

Another defining characteristic of many religions is the following of a set body of beliefs, presented in sacred texts such as the Bible, Koran, or Book of Mormon. The texts contain facts or stories that the group has determined somewhat explain and rationalize their beliefs and the authors of these books are generally held in high regard, whether the groups believe their religious leader wrote them or another important leader of their faith. In the end, the structure of religion allows for attempts at trying to answer

3

life's difficult questions – why a death occurred, why a disease has developed, or other negative events in individual's lives (Johnstone, 2004).

Following a set body of beliefs leads to religious individuals using certain rituals and practices to try and connect to the beliefs, such as participating in Bible study, taking communion, or praying. Most religious prayer is ritualistic, reading from a book or reciting a memorized prayer; petitionary prayer, asking for material items one may desire; or colloquial-style prayer, thanking God for blessings and asking for forgiveness (Francis, & Robbins, 2008).

A final characteristic of religion is having an institution to practice one's faith at and the rate of attendance at that place of worship. An institution aids the social support function of religion, allowing for interaction with others in both spiritual/religious and secular (nonspiritual) ways. Many people develop lasting friendships and personal relationships through attending religious events, and this is likely due to the finding that congregations and individuals who attend religious institutions are highly homogeneous (Schwadel, 2005). It is also likely that churches, Temples, and other institutions provide a foundation for reaching out to communities and helping others. When individuals come together in one place to worship, rather than practicing individually, helping the less fortunate becomes an easier and more frequent task.

Types of religiosity

Two major types of religious orientations have been identified, extrinsic and intrinsic. Developed by Allport and Ross (1967), these types of religiosity are opposite poles on a continuum. Extrinsic individuals "may find religion useful in a variety of ways, to provide security and solace, sociability and distraction, or status and self-justification"

(p. 434). These extrinsic church-goers are usually high in ethnocentrism and authoritarianism, and when turning to God they do not completely turn away from themselves. They are also more likely to hold ethnic prejudices, especially if their church attendance is irregular (Allport & Ross, 1967). Milevsky and Levitt (2004) note that the extrinsically motivated person may use his or her religion, rather than truly believe in it. They may be involved in religion for external reasons, such as social desirability. Gordon, Frousakis, Dixon, Willett, Christman, Furr, and Hellmuth (2008) also found that extrinsically oriented individuals are more likely to be swayed by social pressures. Intrinsically motivated individuals, who are also more constant and devout in their religion, are commonly less prejudiced. They find their master motive in religion. Other needs, strong as they may be, are regarded as ultimately less significant (Allport & Ross, 1967). It seems possible that the internalization of religious beliefs that occurs within intrinsically-oriented individuals may lead them to engage in more positive health behaviors. Intrinsically motivated faith is internalized, and lived out each day. By truly believing that their bodies are God's creation and the other teachings of their religion's sacred texts, individuals with an intrinsic religious orientation may be more likely to live healthier lives. For example, religions of Christianity and Judaism believe that humans were created in God's image, and that one should "glorify God in your body," (New Revised Standard Version Holy Bible, 1 Corinthians 6:20).

<div align="center">Spirituality</div>

Characteristics of spirituality are more difficult to define, as it is a highly personal experience. This has led to the development of a term used by researchers to define

<div align="center">5</div>

and measure spirituality: spiritual wellness. Spiritual wellness is a "continuing search for purpose and meaning in life and an appreciation for the depth of life, expanse of the universe, and natural forces" (Gill, Barrio Minton & Myers, 2010, p. 293). It is separate from only being spiritual in that it includes the physical, biological components of being human rather than only emotional or mental. Spiritual wellness does not only refer to the positive aspects of health, but both positive and negative health behaviors (overall health).

Spiritual wellness has been further dissected into four main categories – meaning and purpose, intrinsic values, transcendent beliefs/experiences, and community/relationships. Intrinsic values refer to a personal belief system. These values may be provided through a set body of religious beliefs or developed personally by spiritual, non-religious individuals. Transcendent beliefs and experiences is belief in a force behind the universe, something beyond natural and rational, or commitment to a higher power. The sense of community and relationships has been defined as a sense of selflessness, willingness to help others, increased love, or your relationship with yourself, others, and the infinite (Westgate, 1996). Spiritual wellness components such as community/relationships and transcendent beliefs/experiences were included in the measurement of spirituality for the present study.

Piedmont (1999) notes other components that describe spirituality. These include tolerance of paradoxes, or the ability to live with inconsistencies; nonjudgmentality, or an ability to accept others on their own terms, and be sensitive to the needs of others; existentiality, or a desire to live in the moment; and finally, gratefulness, an "innate

sense of wonder and thankfulness for all the many shared and unique features of one's life" (p. 989).

<center>Health Behaviors</center>

Health behaviors are important contributors to an individual's overall health, illness and mortality. Major negative health behaviors related to health outcomes are smoking, excessive alcohol consumption, obesity, risky driving, and high risk sexual behaviors. Cigarette smoking and excessive alcohol consumption have both been found to be significant predictors of premature mortality (Friedman, Tucker, Schwartz, Tomlinson-Keasey, Martin, Wingard & Criqui, 1995). In regards to obesity, Desai, Miller, Staples, and Bravender (2008) noted that from 1976 to 2004, "the prevalence of overweight and obesity among adults aged 20 to 74 years increased from 47% to 66%" (p. 109). They found that physical inactivity was associated with increased rates of being overweight and obese in college students, and obesity can be a determining factor in heart disease and death (Dhaliwal & Welborn, 2009). College students are also highly likely to have multiple sex partners, and they represent almost 50% of all new STI (sexually transmitted infections) diagnoses (Quinn & Fromme, 2010). STIs can increase the likelihood of contracting HIV, a non-curable disease that continually weakens the immune system (AIDS Healthcare Foundation, 2008). Risky driving behaviors via speeding, cell phone usage, or alcohol intoxication are also prevalent during one's 20s, especially among males (Begg and Langley, 2001). In a study by Constant, Salmi, Lafont, Chiron, and Lagarde (2009), reduced cell phone usage and speeding were both associated with a decrease in injury rates from road traffic collisions.

<center>7</center>

Positive health behaviors related to health outcomes include exercising, preventative medical screenings, proper nutrition, and general adherence to medical recommendations. Physical activity has been shown to help survival after weight loss in overweight and obese individuals (Ostergaard, Gronbeaek, Schnohr, Sorensen & Heitmann, 2010). It also has been shown to be inversely related to mortality in women (Rockhill, Willett, Manson, Leitzmann, Stampfer, Hunter, & Colditz, 2001). According to the Agency for Healthcare Research and Quality in the U.S. Department of Health and Human Services (2012), males who are better able to work and communicate with their doctors have better health results. The Center for Medicare and Medicaid Services (2011) also states that preventative care helps patients to maintain their health and receive services customized for them.

Personality

One of the most well-researched models of personality is the five-factor model (FFM). Five personality dimensions are included: extraversion, agreeableness, conscientiousness, neuroticism, and openness. The key dimension for this study was extraversion, or surgency. It includes adjectives such as being active, assertive, energetic, outgoing, and talkative. Extraversion is typically thought to be on a continuum, with its opposite descriptor, introversion. All of the five factors have been shown to have convergent and discriminant validity across multiple instruments (McCrae & John, 1992). Personality has a strong genetic component (Penke, Denissen & Miller, 2007), tends to develop through adolescence and into adulthood (Branje, Van

Lieshout,& Gerris, 2007), and the FFM has been shown to be stable over time with adults (McCrae & John, 1992).

Religion, Spirituality and Health Behaviors

Religion and spirituality are thought to be of great importance for the meaning and quality of life for many individuals, and research suggests that there may be important health benefits associated with religion and spirituality. Religion and Spirituality should be related to health behaviors for a number of reasons. A study by Park (2007) summarized the main characteristics of each construct that have the most influence in health outcomes. The first characteristic is meaning in life. With perceived meaning and purpose to one's life comes motivation to maintain physical health. The second characteristic is social support, mainly provided by religious institutions. These religious/spiritual meeting places allow for consistent, prolonged and intimate contact with other individuals who possess similar characteristics. For example, social support has been shown to reduce stress (Ensel & Lin, 1991). The next central component Park recognizes as important to health outcomes is body sanctification. Many religions advise treating the body as sacred, which carries implications of avoiding sexual promiscuity and alcohol or drug abuse. The final characteristic is the perceived locus of control over one's health, which is the extent to which individuals believe their health is a result of their own actions, some outside force/God, or a combination of both, as opposed to behavior that occurs randomly by fate which is outside of any systematic control.

Religion, Health Outcomes and Health Behaviors

Repetitive rhythmic stimulations, such as saying congregational prayers in church or singing hymns, can drive the limbic and autonomic systems. Participating in spiritual/religious behaviors also lowers blood pressure, decreases the heart rate, and helps keep the immune system functioning (Newberg, D'Aquili & Rause, 2001). Other studies have shown that participation in religion, a belief in God, attending church regularly, and engaging in Bible study are all associated with reduced rates of suicide, death from heart disease and depressive symptoms, along with higher levels of overall well-being (Levin, 1996; McCllough, 1995). Participation in religion has also been found to increase longevity, especially in elderly participants (Koenig, Hays, Larson, George, Cohen, McCllough, Meador, & Blazer, 1999).

In regards to health behaviors, a study conducted using data from the National Center for Health Statistics found that a higher frequency of religious service attendance was associated with being less likely to smoke (Gillum & Dupree, 2007). Another study conducted in Mexico found that attending religious services and participating in religious activities organized by the church increase preventative screening utilization (Benjamins, 2007). Finally, a recent finding in the past year was that an extrinsic religious orientation, as opposed to an intrinsic orientation, predicted poorer health responsibility and nutrition (Homan & Boytatzis, 2010).

Spirituality and Health Behaviors

A study by Park, Edmondson, Hale-Smith, and Blank (2009) found that daily spiritual experiences (perception of or interaction with a higher power, or God) were

related to better nutrition and exercise in cancer survivors, as well as greater adherence to advice from a physician. Another study found that high levels of spirituality (upper 30% of the sample) were related to exercising more often and increased physical activity overall in college students (Nagel & Sgoutas-Emch, 2007). These studies were conducted with healthy samples. A large number of studies examining relationships between spirituality and health behaviors have been conducted with patient samples, individuals who have HIV/AIDS, or mental illnesses (Nichols & Hunt, 2011; Kudel, Cotton, Szaflarski, Holmes & Tsevat, 2011; Danbolt, Moller, Lien & Hestad, 2011). The patient sample studies found positive benefits to utilizing spirituality as a method of treatment, such as increased social support and more positive moods.

Personality and Health Behaviors

Certain personality traits have been linked to risky health behaviors, especially the personality trait of extraversion. Individuals high in extraversion are more likely to engage in risky health behaviors than other personality types. These behaviors include smoking, abuse of drugs and alcohol, drunk driving, and risky sexual behaviors (Vollrath & Torgersen, 2008). Another study conducted with a sample of college students found that those students at the highest levels of extraversion were more likely to smoke, binge drink, and engage in risky sexual behaviors than individuals with any other Big Five personality trait (Raynor & Levine, 2009). Hong and Paunonen (2009) also found that extraversion was associated with alcohol abuse.

Research Questions and Hypotheses

Central research question: Does religiosity or spirituality contribute more to health behaviors?

A central research question of whether religion or spirituality contributes more to health behaviors was examined. Many studies have investigated the combined effects of religion and spirituality as one construct on health, or only examined one of the constructs (Rippentrop, Altmaier, Chen, Found, & Keffala, 2005; Powell, Shahabi, & Thoresen, 2003; Rosmarin, Pargament, & Flannelly, 2009; Masters, 2008). Studies conducted on the influence of religion on health have found a majority of positive results (Krause, 2011; Maltby, Lewis, Freeman, Day, Cruise, & Breslin, 2010; Seybold & Hill, 2001). The same has been found for spirituality (Nelms, Hutchins, Hutchins, & Pursley, 2007; Wang, Chan, Ng, & Ho, 2008), but which construct contributes *more* to positive health? The present study will compare religion and spirituality as separate constructs in an attempt to answer this question.

Hypothesis 1: Extraversion will be positively correlated with religiosity and negatively correlated with spirituality.

The first hypothesis is that extraversion will be positively correlated with religiosity and negatively correlated with spirituality. Since social support is a main difference between religion and spirituality, and extraverts are more drawn to social interactions, they may also be more likely to follow a religious path. The few studies that have been conducted in this area have produced what appear to be inconsistent findings. Chlewinski (1981) found that in regards to religious and atheist individuals, those who were religious were more introverted. Francis and Bourke (2003) also found

that a positive attitude towards Christianity was associated with introversion. However other studies found extraversion to be positively related to both spirituality (Maltby & Day, 2001) and religiosity (Saroglou, 2002). Examining these relationships through the use of measures that more clearly differentiate between spirituality and religiosity will be helpful in both clarifying these discrepancies and extending current conceptualizations of extraversion.

Hypothesis 2: Intrinsic religious orientation will be positively correlated with spirituality.

The second hypothesis is that spirituality will be positively correlated with intrinsic religious orientation and therefore negatively correlated with extrinsic religious orientation. Both spirituality and intrinsic religious orientations are held in a more personal sense than extrinsic religious orientations. Berkel, Armstrong, and Cokley (2004) found that individuals with more intrinsic religious beliefs scored higher on a spiritual beliefs scale. Although not directly relevant, another study found that both intrinsic religious orientation and high spiritual well-being predicted low levels of anxiety (Davis, Kerr & Kurpius, 2003). Both of these studies were conducted with young adults less than thirty years of age and both used a religious orientation scale based on Allport and Ross (1967). Their spirituality measures however, differed. A clearer understanding of this relationship may result from using a measure of spirituality not used before with these constructs, as well as using an older sample of adults. No specific hypothesis will be made with regard to the correlation between religiosity and extrinsic religious orientation due to a relative lack of research and theory comparing these two constructs, although this relationship will be examined.

Hypothesis 3: Extraversion will be associated with religious orientation and be positively correlated with extrinsic religious orientation.

The third hypothesis is that extraversion will be positively correlated with extrinsic religious orientation. Religious orientation has been linked to individual prejudices, sociability, and overall internalization of religious beliefs (Allport & Ross, 1967; Milevsky & Levitt, 2004; Gordon, Frousakis, Dixon, Willett, Christman, Furr, & Hellmuth, 2008). Only a few studies have examined the relationship between personality and religious orientation. One conducted by Ross and Francis (2010) found that intrinsic religious orientation scores were higher among extraverts than introverts for a Christian adult sample. This seems counter-intuitive, as I would expect extrinsically-oriented individuals to be more extraverted due to both constructs having the similar characteristic of high sociability. Francis, Robbins, and Murray (2010) found that extraverts had higher scores than introverts on extrinsic religiosity, while introverts had higher scores than extraverts on intrinsic religiosity in an Anglican adult sample. An additional meta-analysis by Saroglou (2002) found extraversion to be weakly associated with religiosity. By using different personality and religious orientation measures, as well as participants of various religions, more exploration into this relationship could help to resolve the obvious discrepancies in previous research. The relationship of these variables could also be influential for health outcomes.

Hypothesis 4: Intrinsic religious orientation will be positively correlated with positive health behaviors.

The fourth hypothesis is that intrinsic religious orientation will be positively correlated with positive health behaviors. No specific hypothesis will be made in

regards to extrinsic orientation and negative health behaviors, although this will be examined. Intrinsic religious orientation has been associated with better mental health and increased sense of well-being, whereas extrinsically-oriented individuals were more likely to have depression and anxiety (Homan & Boyatzis, 2010). Another study found that intrinsic types were more likely to have low body mass indexes and less likely to smoke tobacco or drink alcohol (Masters & Knestel, 2011). While both of these studies point to more positive health for individuals with intrinsic religious orientations, they did not concentrate on college students and they examined only two specific negative health behaviors. The present study will involve college students and provide a more comprehensive set of measures of health behaviors.

Hypothesis 5: Spirituality and religiosity act as moderators between extraversion and negative health behaviors.

The final hypothesis is that spirituality acts as a moderator between extraversion and negative health behaviors, such that spiritual extraverts will show fewer negative health behaviors than extraverts who are not spiritual. The same hypothesis will be tested for religiosity as a moderator. Research has found that extraverts are more likely than introverts to partake in negative health behaviors (Vollrath & Torgersen, 2008; Raynor & Levine, 2009; Hong & Paunonen, 2009). Previous research has also found that participating in religious acts can reduce negative health behaviors (Gillum & Dupree, 2007; Benjamins, 2007). These studies were not focused on college samples, using data from the National Center for Health Statistics (NCHS) and a middle-aged/older adult sample from Mexico. Research has yet to examine the possibility of a moderating effect between these variables. The present study will include college

15

students, view religion and spirituality separately, and observe eight negative health behaviors.

<div align="center">Method</div>

Participants

College student participants were recruited through the University of North Texas' SONA system, which allows students to volunteer for research studies online. The students received extra credit or credit towards a course for their participation. A community sample was recruited via the social media website Facebook. A link to Survey Monkey was posted on individual statuses and various spiritual, religious, atheist, and agnostic groups. Examples of these groups included Spirituality & Metaphysical, Atheist and Proud!, Agnostic, and The United Methodist Church. Each of these groups (and many others) has at least 8,000 members and active posts each week, if not each day. The student sample consisted of 207 participants and the community sample consisted of 120 participants. Information was collected regarding participants' gender, age, race/ethnicity, education level and income/parental income. See Table 2 for additional demographic information.

Measures

- Religiosity Index. As part of the ASPIRES (Assessment of Spirituality and Religious Sentiments) measure, the Religiosity Index, or RI, was developed by Piedmont in 2001. Participants rate the frequency of their religious behaviors - how often they read the holy books, pray, and attend religious services – by responding to

12 items. Examples of the items include "How often do you read the Bible/Torah/Koran/Geeta," "How frequently do you attend religious services," and "How often do you pray." The Religiosity Index has been found to have an internal consistency of .77 (Piedmont, 2009). This scale has been used to predict religiosity in Filipino, Sri Lankian, and American samples and has been shown to be psychometrically sound (Dy-Liacco, Piedmont, Murray-Swank, Rodgerson, and Sherman, 2009; Piedmont, Werdel, and Fernando, 2009; Piedmont, Ciarrochi, Dy-Liacco and Williams, 2009). The measure reflects important behavioral characteristics of religion that separate it from spirituality. The coefficient alpha found for the present study was .82.

- Religious Orientation Scale - Revised. The original measure was developed by Allport and Ross (1967) and revised by Gorsuch and McPherson (1989). The Religious Orientation Scale – Revised has 14 items and it separates intrinsically and extrinsically worded items on a 5-point Likert scale (8 intrinsic, 6 extrinsic). Examples of items from this scale include, "I enjoy reading about my religion," and "I go to church mainly because I enjoy seeing people I know there." This measure has been used in studies predicting religiosity in older adults (Homan and Boyatzis, 2010), religious orientation in United Kingdom adults (Lewis, Maltby, and Day, 2005), as well as other constructs. Reliability for the Intrinsic subscale is .83, while the Extrinsic scale reports a lower internal consistency of .65. The coefficient alpha found for the present study was .83. The scale is scored as one continuous scale rather than separate subscales.

- Spirituality Assessment Scale. The Spirituality Assessment Scale, or SAS, developed by Howden in 1992 and was used to assess spirituality. Similar to

Westgate's spiritual wellness model, this test includes 28 questions and four subscales similar to the components of spiritual wellness described earlier. The subscales include Purpose and Meaning in Life, Transcendence, Unifying Interconnectedness, and Inner Resources. Examples of the items include, "I feel a connection to all of life," "I can go to a spiritual dimension within myself for guidance," and "There is fulfillment in my life." The measure employs a 6-point response format ranging from *strongly disagree* to *strongly agree*, with no neutral option (Howden, 1993).This instrument has been shown to have strong discriminant validity, as there was no statistically significant relationship between the factors of spirituality and attendance at religious events. With an emphasis on attitudes and beliefs, the SAS may be able to distinguish between religiosity and spirituality (Gill et al., 2010). Reliability for the Spirituality Assessment Scale is high at .92. The four subscales were found to have acceptably high internal consistency: 1. Purpose and Meaning in Life (4 items), alpha=.91; 2. Innerness or Inner Resources (9 items), alpha=.79; 3. Unifying Interconnectedness (9 items), alpha=.80; 4. Transcendence (6 items), alpha=.71 (Howden, 1993). The coefficient alpha found for the present study was .90. The scale also does not include items on health, so as not to overlap with additional health measures.

- Big Five Inventory. The Big Five Inventory (John, Donahue, & Kentle, 1991) is a 44-item measure of personality reflective of the Big Five dimensions (extraversion, agreeableness, conscientiousness, neuroticism, and openness). Items are rated on a 5-point Likert scale and include asking if the participant "is reserved," "tends to be disorganized," or "prefers work that is routine." Test-retest reliability has been found to be .84 (Rammstedt & John, 2007) and each subscale has found alpha coefficients of

.75 or above (Robie, Komar, & Brown, 2010). The coefficient alpha found for the present study was .84. The measure has been used in studies predicting aspects of narcissism, effects of coaching and speeding on Big Five traits, Facebook usage, and many other constructs (Carlson, Vazire, & Oltmanns, 2011; Robie, Komar, & Brown, 2010; Ryan, & Xenos, 2011). The BFI has been found to have strong convergence with the NEO PI-R (.72-1.00) (Soto & John, 2009). The same 2009 study found that each BFI facet scale correlated more with the corresponding NEO PI-R facet (.44-.48) than other NEO PI-R facets.

- The Health Promoting Lifestyle Profile II. Developed by Walker, Sechrist, and Pender, (1987) this questionnaire has 52 health-promoting behaviors categorized into six categories: health responsibility, physical activity, nutrition, spiritual growth, interpersonal relations, and stress management. The responses to the questionnaire items are on a 4-point Likert scale, ranging from *never* (N) to *routinely* (R). Cronbach's alpha for the total scale has been reported as .94 by the authors, and the subscale alphas range from .79-.87. Construct validity is reported at .68 and test-retest reliability for the total scale is .89. Only three of the subscales were used, for a total of 26 items – health responsibility, physical activity, and nutrition. Examples of items on these subscales include, "choose a diet low in fat, saturated fat, and cholesterol," "report any unusual signs or symptoms to a physician or other health professional," and "follow a planned exercise program." The coefficient alpha found for the present study was .92 for the three subscales utilized. The HPLP II has been widely used in studies examining health behaviors across various ages, ethnicities, and religions (Homan & Boyatzis, 2010; Nagel & Sgoutas-Emch, 2007; Al-Kandari, Vidal & Thomas, 2008).

- Youth Risk Behavior Surveillance System. The YRBSS questionnaire
(Centers for Disease Control and Prevention, 2011) is a public domain collection of
items originally designed for high school-aged students. Eighty-six items are divided into
10 categories of health behaviors, including safety, violence/bullying, suicide, tobacco
use, alcohol consumption, drug use, risky sexual behaviors, obesity, food consumption,
and physical activity. Only eight of the categories were used for this study – safety,
violence/bullying, suicide, tobacco use, alcohol consumption, drug use, risky sexual
behaviors, and obesity - as these are more negative behaviors not covered by the
HPLP II. Examples of the items include, "during the past 30 days, how many times did
you drive a car or other vehicle when you had been drinking alcohol," "during the past
30 days, on how many days did you smoke cigarettes," "how old were you when you
had your first drink of alcohol other than a few sips," "during your life, with how many
people have you had sexual intercourse," and "how do you describe your weight?"
These eight categories were further reduced to 18 items, as stated in the results.
Several of the YRBSS subscales have found good reliability ranging from .73-.79 for the
risky sexual behaviors, alcohol consumption, and tobacco use subscales (Miller and
Quick, 2010). Test-retest reliability has been found to be less than .61 (Centers for
Disease Control and Prevention, 2011). The coefficient alpha found for the final 18
items utilized in present study was .85. The scale is widely used (Santelli, Robin, Brener
& Lowry, 2001; Everett Jones, Anderson, Lowry & Conner, 2011; Burstein, Lowry, Klein
& Santelli, 2003).

Results

The total number of participants was 327. Community members totaled 120 and

UNT students were the remaining 207. The samples were compared on the variables of

religiosity and spirituality to determine if separate analyses should be conducted.

Independent samples t-tests revealed that the subsamples were significantly different

on the variables of religiosity (t(325) = 2.22, p = .027) and spirituality (t(325) = 3.04, p =

.003), with the community sample reporting higher levels of spirituality and religiosity. As

these are two of the main variables of concern within this study, the subsamples were

analyzed separately.

Missing Data

Missing data values analysis indicated that of the 327 cases, 36% contained at

least 1 missing value on one or more of the variables. The spirituality variable had the

most missing data with 11.6% of the cases missing at least one value. This may reflect

the difficult nature of answering spiritual questions which are ambiguous in nature and

require introspection. The data were treated as missing at random (MAR), with no

pattern to the missing values as indicated by visual inspection of graphs created in

SPSS. Random recursive partitioning (RRP) was utilized to replace missing values. This

technique is considered the best to use with data that contains both categorical and

continuous values (Strobl, Malley & Tutz, 2009). Based on the concept of "nearest

neighbor," RRP compared cases with the most similar means on each variable to

replace missing data. For example, within the variable of spirituality, the first step of

RRP created two groups of cases that contained relatively similar responses (means) of

spirituality. From each of those groups two new groups were formed. The partitioning continued, and stoped when all of the groups were as homogeneous as possible in terms of their spirituality means. The means of the subsamples' spirituality scores were almost, if not exactly identical. Cases within these groups were now believed to be "equal" and the means were used to replace missing data within that variable (Porro & Iacus, 2009). See Figure 1 for an example of RRP.
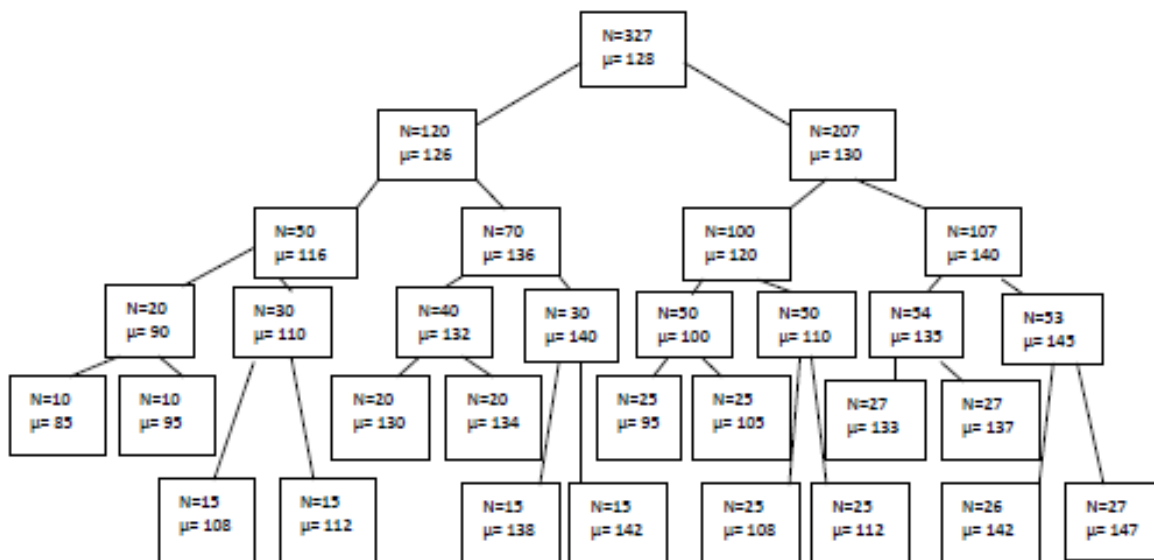
Figure 1. Random recursive partitioning. Groups continue to reduce until group averages are as similar as possible.

Creating Variables

To create separate and comprehensive negative and positive health behavior variables, a factor analysis was conducted over 18 negative health items and 23 positive health items. The negative health items emphasized drug use and alcohol consumption. Two factors were extracted and the items loaded onto the two factors as expected, with one representing negative health behaviors and the other positive health

behaviors. Factor/composite scores were generated and used for remaining analyses in place of the raw scores. Utilizing the factor/composite scores allowed for each variable to not equally contribute to the composite score (as simply finding the mean would assume all variables are equally contributing to the composite score). This is more reflective of how variables truly act (Tabachnick & Fidell, 2007). A varimax rotation was conducted due to the low correlation of the health behavior items. The Bartlett's test of sphericity was significant (χ^2 (820) = 5357.45, p < .01). Factor 1 (negative health behaviors) accounted for 19.80% of the variance and factor 2 (positive health behaviors) accounted for 12.02%. Table 1 shows the factor loadings for all 41 items.

Table 1

Factor Loadings for Negative and Positive Health Behaviors

	Factor 1 (Negative Health)	Factor 2 (Positive Health)
LifeUse_Cocaine	.736	
LifeUse_Meth	.725	
LifeUse_Ecstasy	.722	
LifeUse_Needle	.654	
LifeUse_Heroin	.649	
LifeUse_Prescription	.583	
LifeUse_Marajuana	.563	
LifeUse_Steroids	.562	
Number_Cigarettes	.558	
LifeUse_Inhalents	.543	
Days_Smoked	.516	
Cigars	.465	
ChewTobacco_Sniff_Dip	.440	
Days_5ormore_Alcohol	.388	
Driver_Alcohol	.360	
MonthDays_One_Alcohol	.285	
Seat_Belt_Other_Driver	.210	
Passenger_Driver_Alcohol	.190	
Ask_For_Info		.730
Discuss_Health_Doctors		.670
Low_Fat_Diet		.652

(table continues)

Table 1 *(continued)*.

	Factor 1 (Negative Health)	Factor 2 (Positive Health)
Question_Doctor_to_Understand		.622
Limit_Sugar		.593
Target_Heart_Rate		.589
Health_TV		.587
Second_Opinion		.581
GoTo_Doctor		.570
Light_Moderate_Activity		.568
Exercise_20min_3xday		.563
Exercise_Program		.563
Stretch_3xperWeek		.562
Read_Labels		.553
Recreational_Physical_Activities		.530
Inspect_Body_Changes		.526
Seek_Counseling		.517
Educational_Health_Programs		.485
Exercise_Daily_Casual		.442
Eat_Breakfast		.417
Servings_Dairy		.401
Servings_Meat		.397
Servings_Rice_Pasta		.246

A new variable was also created for intrinsic and extrinsic religious orientations. In following the suggested scoring system by developers of the measure Gorsuch and McPherson (1989), a cut-off score of 3 indicated that those who reported an average response of 4 or 5 on either the intrinsic or extrinsic items were significantly oriented on that scale. This scoring system may be based on the assumption that individuals above the cutoff are participating in religious behaviors, while those who are not are relatively non-religious (Lewis & Maltby, 1996). This dichotomous scoring however does not follow traditional thought of religious orientation as a continuum with two opposite poles (Allport & Ross, 1967). Additional studies utilizing this measure have altered the scoring system (Lewis & Maltby, 1996; Jurkovic & Walker, 2006) to a 3-point continuous scale, with a score of 1 indicating disagreement, 2 as neutral, and 3 as agreement with each

item. Similar to these studies, responses for the present study were re-scored as a continuous scale of 1-5, rather than utilizing the cut-off score. Scores of 1-2 (disagreement with most items on the measure) represented an extrinsic orientation and scores of 4-5 (agreement with most items) represented an intrinsic orientation. Scores of 3 were considered neutral. The re-scoring of responses led to 71 participants who reported an extrinsic orientation and 68 participants who reported an intrinsic orientation.

Lastly, two demographic variables were coded. Gender was coded as 0 = male, 1 = female and ethnicity was dummy coded with 1= the reference group, 0 = comparative group (Caucasian). This resulted in 4 ethnicity groups: African-American, Asian, Hispanic, and other.

Outliers

Variables were next screened for outliers. Outlying cases were observed on the variables of spirituality and negative health behaviors. Examination of the scatterplots and studentized deleted residuals (SDR) indicated that these variables had 8 outlying cases – 7 on negative health behaviors and 1 on spirituality. Studentized residuals are calculated by obtaining the differences between predicted regression line values and the actual values for a given case. They account for the influence of error in values which are farther away from the mean of the given variable. Studentized deleted residual values are calculated for each case when that case is removed from the analysis – a new predicted regression line value is created without a given case. A regression analysis with SDR takes into account the influence of each case (Brannick,

2007). As suggested by Tabachnick and Fidell (2007), SDR values greater than +/- 3.29 were considered outliers. These authors also suggest that the raw scores of these values be altered so that they are 1 unit larger than the next most extreme score in keeping with the ordinal ranking of the values. While this procedure did reduce the outlier in Spirituality, it did not reduce the outliers on Negative Health Behaviors. The next most extreme scores within the Negative Health Behaviors variable were used until altering values to the fifth most extreme score (1.97) reduced all outliers. After raw scores were adjusted to one unit larger than this value, all SDR values fell below 3.29. In all, 11 negative health raw values were altered so that the original 7 could fit within an acceptable standard deviation range.

Demographics

Demographic information was examined for the 2 samples. The student sample was predominately female (72%) with a mean age of 22.4. This sample contained a majority of Caucasian ethnicities (57%) and naturally had a majority with some college education (82%). The community sample reported similar findings to the UNT student sample on all demographic variables except for an older average age of 30.7, an absence of African-American individuals, more post-bachelor education, and higher reported income. Additional demographic information can be found in Table 2, and Table 3 shows descriptive information for each of the major variables within each sample.

Table 2

Demographic Information

			UNT Students (*n* = 207)		Community Sample (*n* = 120)
Age	M		22.4		30.7
	SD		6.6		11.6
		Freq	%	Freq	%
Gender	Male	58	28.0	47	39.2
	Female	149	72.0	73	60.8
Ethnicity	Caucasian	118	57.0	104	86.7
	African-American	25	12.1	--	--
	Asian-American	23	11.1	6	5.0
	Hispanic	36	17.4	6	5.0
	Other	5	2.4	4	3.2
Education	No HS	1	0.5	2	1.7
	GED	4	1.9	4	3.3
	Some College	169	81.6	36	30.0
	Associates	18	8.7	6	5.0
	Bachelors	13	6.3	38	31.7
	Some Grad	--	--	13	10.8
	Masters	2	1.0	18	15.0
	Doctorate	--	--	3	2.5
Income	Less than $12,000	49	23.7	10	8.3
	$12,000 to $29,999	34	16.4	21	17.5
	$30,000 to $49,999	32	15.5	29	24.2
	$50,000 to $69,999	26	12.6	15	12.5
	$70,000 to $89,999	14	6.8	16	13.3
	More than $90,000	52	25.1	29	24.2
Greek	Yes	15	7.2	10	8.3
	No	192	92.8	110	91.7

Table 3

Descriptive Information for Major Variables

	UNT Students (*n* = 207)			Community Sample (*n* = 120)		
	M	*SD*	Range	*M*	*SD*	Range
Religiosity	3.76	1.12	2-6*	4.05	1.16	2-6*
Religious Orientation	2.91	0.63	1-4*	2.96	0.69	1-5*
Spirituality	126.12	16.24	78-164**	131.76	16.04	87-163**
Extraversion	3.20	0.75	1-5*	3.32	0.83	1-5*
Positive Health Behaviors	-0.11	0.95	-2.10-3.04	0.20	0.93	-2.02-3.07
Negative Health Behaviors	-0.09	0.64	-0.55-2.07	-0.01	0.71	-.55-2.08

Note. *This variable was scored as an average of all items **This variable was scored as a sum of all items.

Power Analysis

Guidelines suggested by Cohen (1988) were used to conduct a power analysis

using G*Power 3.1.3. Power for a correlation attempting to detect a moderate effect size

was .99 within the community sample and .93 within the UNT sample. For a small effect

size, achieved power was .30 for the community sample and .19 for the UNT sample.

When accounting for the demographic variables within each analysis, power suggested

for multiple regression analyses using 10 predictors to detect a moderate effect size

was .98 within the community sample and .81 within the UNT sample. To detect a small

effect size, achieved power was .21 for the community sample and .13 for the UNT

sample. The present study's power was considered low but acceptable for all correlation and regression analyses.

Correlations

A correlation matrix was constructed to examine the relationships among the major variables of interest within each sample. Within the student sample Spirituality was correlated with Extraversion (r = .363, p < .001), Religiosity (r = .361, p < .001), Positive Health Behaviors (r = .240, p < .001), and Religious Orientation (r = .304, p < .001). A strong correlation occurred between Religiosity and Religious orientation (r = .707, p < .001), indicating that intrinsically oriented individuals tended to be more religious. Negative Health Behaviors did not hold significant correlations with any of the major variables while Positive Health Behaviors were correlated with Spirituality (r = .240, p < .001) and Religiosity (r = .191, p = .006).

Within the community sample, a notably stronger correlation existed between Spirituality and Religiosity (r = .544, p < .001). Spirituality was also correlated with Positive Health Behaviors (r = .372, p < .001) and Religious Orientation (r = .456, p < .001). A similar correlation to that found in the student sample occurred between Religiosity and Religious Orientation (r = .770, p < .001). Negative Health Behaviors held significant correlations in this sample with Religiosity (r = -.197, p = .031) and Extrinsic Religious Orientation (r = -.236, p < .010). The full matrix is presented in Table 4.

Table 4

Correlations of Major Variables

		Extraversion	Spirituality	Religiosity	Religious Orientation	Negative Health Behaviors	Positive Health Behaviors
Community Sample	Extraversion	1					
	Spirituality	.203*	1				
	Religiosity	-.023	.544**	1			
	Religious Orientation	-.020	.456**	.770**	1		
	Negative Health Behaviors	.042	-.011	-.197*	-.236*	1	
	Positive Health Behaviors	.136	.372**	.331**	.196*	-.014	1
UNT Students	Extraversion	1					
	Spirituality	.363**	1				
	Religiosity	.029	.361**	1			
	Religious Orientation	.039	.304**	.707**	1		
	Negative Health Behaviors	.024	-.103	-.061	-.072	1	
	Positive Health Behaviors	.092	.240**	.191*	.089	.059	1

Note. * indicates significance at *p* < .05, ** indicates significance at *p* < .001; N = 120 for Community sample, N = 207 for UNT students.

Student Sample

Central research question: Does religiosity or spirituality contribute more to health behaviors?

Four hierarchical multiple regressions were used to determine whether religiosity or spirituality contributes more to health behaviors within the student sample, after controlling for the influence of demographic variables and order of entry into the analysis. Assumptions of the regression were all met via examination of scatterplot, histogram, and VIF/tolerance statistics. In examining the positive health behaviors of the student sample gender, age, ethnicity, education and income were entered into Block 1. These demographic variables explained 5.6% of the variance in positive health behaviors. The block was statistically non-significant ($F(8, 198) = 1.45$, $p = .176$), however household income ($\beta = .170$, $p = .016$) appeared to make a notable contribution to prediction. Spirituality was entered into Block 2 and added 6.2% variance accounted for with an F change $(1, 197) = 13.73$, $p < .001$. Religiosity was added in Block 3 and added 1.3% variance accounted for above and beyond Spirituality, but the F change was non-significant (F change $(1, 196) = .886$, $p = .084$). The final model explained 13% of the variance in positive health behaviors, with $F(10, 196) = 2.94$, $p = .002$. Spirituality ($\beta = .207$, $p = .005$) appeared to be the only predictor of positive health behaviors. Entering Religiosity in Block 2 (F change $(1, 197) = 8.64$, $p = .004$) and Spirituality into Block 3 (F change $(10, 196) = 2.94$, $p = .002$) indicated that spirituality added to the prediction of positive health behaviors over and above the effects of religiosity. In the final model, with all predictors entered, Spirituality continued to be the only significant predictor ($\beta = .207$, $p = .005$).

In examining a scatterplot of the negative health behaviors of the student sample, the data did not appear normal. After attempting log, inverse, and square root transformations of negative health scores, none of the transformations were successful. The results of this regression should therefore be interpreted with caution. The demographic variables were entered into Block 1. These variables accounted for 26.7% of the variance in negative health behaviors. Males (β = -.211, p = .001), age (β = .371, $p < .001$), education (β = -.129, p = .040) and household income (β = -.171, p = .006) all made notable contributions to prediction. Spirituality was entered in Block 2 (F change (1, 197) = .929, p = .336) and Religiosity in Block 3 (F change (1, 196) = 1.02, p = .314), however neither explained a significant amount of variance above and beyond the demographic variables. The final model explained 27.4% of the variance in negative health behaviors, with $F(10, 196) = 7.40$, $p < .001$. Neither Religiosity nor Spirituality appeared as notable predictors of negative health behaviors. Entering Religiosity in Block 2 (F change (1, 197) = 1.68, p = .197) rather than Spirituality which was entered into Block 3 (F change (1, 196) = .274, p = .602) did not alter these conclusions. Bivariate correlations between spirituality and positive health (r = .240, $p < .001$) as well as religiosity and positive health (r = .191, p = .006) for the student sample support these findings. No significant correlations existed between negative health behaviors and spirituality or negative health behaviors and religiosity.

Hypothesis 1: Extraversion will be positively correlated with religiosity and negatively correlated with spirituality.

Two hierarchical multiple regressions were used to evaluate hypothesis 1. In the UNT student sample, all assumptions of the regression for predicting Spirituality were

32

met. Demographic variables of gender, age, ethnicity, education and income were entered into Block 1. These variables explained 4.4% of the variance in Spirituality ($F(8, 198) = 1.15$, $p = .335$), which was not statistically significant, although results for higher education level ($β = .150$, $p = .038$) were notable. The entry of Extraversion into Block 2 added 12.7% of explained variance (F change $(1, 197) = 30.31$, $p < .001$). The final model accounted for 17.2% of the variance in Spirituality, with $F(9, 197) = 4.54$, $p < .001$. Extraversion was a notable predictor ($β = .364$, $p < .001$), and there was also a positive bivariate correlation between Extraversion and Spirituality ($r = .363$, $p < .001$).

Assumptions were also met in the regression analysis using extraversion to predict religiosity. Demographic variables were again entered into Block 1, which accounted for 8.9% of the variance in Religiosity ($F(8, 198) = 2.41$, $p = .017$). Age ($β = .160$, $p = .025$) and Other ethnicity ($β = -.146$, $p = .038$) were notable predictors of Religiosity, indicating that with increased age and greater white ethnicity, religiosity increased. Extraversion was entered into Block 2 and did not add any explained variance (F change $(1, 197) = .000$, $p = .992$). The final model accounted for 8.9% of the variance in Religiosity, and while the model was significant ($F(9, 197) = 2.13$, $p = .029$), Extraversion was not shown to be a predictor of Religiosity ($β = -.001$, $p = .992$).

Hypothesis 2: Intrinsic religious orientation will be positively correlated with spirituality.

Two hierarchical multiple regressions were used to determine whether religious orientation would be associated with Spirituality. Assumptions of the regression for UNT students were all met via examination of scatterplot, histogram, and VIF/tolerance statistics. Demographic variables of gender, age, ethnicity, education and income were

entered into Block 1 ($F(8, 198) = 1.14$, $p = .335$). These variables accounted for 4.4% of the variance in Spirituality. Education ($\beta = .150$, $p = .038$) appeared to be a notable predictor in the first block. Religious orientation was entered in Block 2 with lower scores indicating an extrinsic orientation and higher scores indicating an intrinsic orientation. This variable explained an additional 8.2% of the variance (F change (1, 197) = 18.51, $p < .001$). The final model accounted for 12.6% of the variance in Spirituality, with $F(9, 197) = 3.16$, $p = .001$. Religious orientation was associated with Spirituality ($\beta = .304$, $p < .001$). Correlations of religious orientation with Spirituality ($r = .304$, $p <.001$) indicate that with higher religious orientation scores (intrinsic orientation), Spirituality increased.

The additional research question in connection to the second hypothesis, whether extrinsic religious orientation would be associated with Religiosity, was examined via hierarchical multiple regression. Assumptions of the regression for the student sample were all met. Demographic variables were entered into Block 1 ($F(8, 198) = 2.41$, $p = .017$). These variables accounted for 8.9% of the variance in Religiosity. White ethnicity ($\beta = -.132$, $p = .010$), appeared as a notable predictor. Religious orientation was entered into Block 2 and added 43.7% explained variance beyond the demographic variables (F change (1, 197) = 181.20, $p < .001$). The final model accounted for 52.5% of the variance in Religiosity, with $F(9, 197) = 24.22$, $p < .001$. Religious orientation ($\beta = .702$, $p < .001$) was positively correlated with Religiosity ($r = .707$, $p < .001$), indicating that intrinsic, rather than extrinsic religious orientation was related to greater levels of religiosity.

Hypothesis 3: Extraversion will be associated with religious orientation and be positively correlated with extrinsic religious orientation.

Hierarchical multiple regression was utilized to determine if extraversion would be associated with an extrinsic religious orientation. For the UNT student sample all assumptions of the regression were met. Block 1 included gender, age, ethnicity, education and income, which accounted for 11.4% of the variance in religious orientation (F (8, 198) = 3.19, p = .002). Age (β = .152, p = .030) and African-American ethnicity (β = .277, p < .001) were notable predictors, indicating that with increased age and African-American ethnicity, an individual is more likely to hold an intrinsic religious orientation. Extraversion was added in Block 2, but it did not add any additional variance above and beyond the demographic variables (F change (1, 197) = .045, p = .832). The final model explained 11.4% of the variance in religious orientation, with F(9, 197) = 2.83, p = .004. Extraversion (β = .014, p = .832) was not significantly associated with religious orientation.

Hypothesis 4: Intrinsic religious orientation will be positively correlated with positive health behaviors.

Two hierarchical multiple regressions were used to determine whether an intrinsic religious orientation would be associated with positive health behaviors after controlling for the influence of demographic variables. Assumptions of the regression were all met via examination of scatterplot, histogram, and VIF/tolerance statistics. In examining the positive health behaviors of UNT students, gender, age, ethnicity, education and income were entered into Block 1. These variables explained 5.6% of the variance in positive health behaviors (F (8, 198) = 1.45, p = .176). Although this block

was not significant, household income (β = .170, *p* = .016) appeared to be a notable

contributor, indicating that with a higher household income comes more positive health

behaviors. Block 2 introduced religious orientation, which accounted for an additional

1% of the variance (F change (1, 197) = 2.06, *p* = .153). The final model explained 6.5%

of positive health behaviors, with *F*(9, 197) = 1.53, *p* = .140. Religious orientation (β =

.105, *p* = .153) was not significantly associated with positive health behaviors.

Hierarchical multiple regression was utilized to examine the research question in

connection to this hypothesis - whether extrinsic religious orientation would be

associated with negative health behaviors. The data should again be interpreted with

caution due to the non-normality of the negative health behaviors variable.

Demographic variables were entered into Block 1, which accounted for 26.7% of the

variance in negative health behaviors (*F* (8, 198) = 9.01, *p* < .001). Male gender (β = -

.211, *p* = .001), increased age (β = .371, *p* < .001), decreased education level (β = -

.129, *p* = .040) and decreased household income (β = -.171, *p* = .006) all made notable

contributions to prediction of increased negative health behaviors. Block 2 included

religious orientation, which did not explain any additional variance (F change (1, 197) =

2.56, *p* = .111). The final model accounted for 27.6% of the variance in negative health

behaviors, with *F*(9, 197) = 8.36, *p* < .001. Although the final model was significant,

religious orientation (β = -.103, *p* = .111) was not a significantly associated with negative

health behaviors.

Hypothesis 5: Spirituality and religiosity act as moderators between extraversion
and negative health behaviors.

The fifth and final hypothesis that spirituality and religiosity would act as

moderators in the relationship between extraversion and negative health behaviors was analyzed using two hierarchical multiple regression models. In examining the student sample, the variable of negative health behaviors was again not normal. The results of this hypothesis should therefore be interpreted with caution. Block 1 included demographic variables of gender, age, ethnicity, education, and income. These variables accounted for 26.7% of the variance in negative health behaviors (F (8, 198) = 9.01, $p < .001$). Male gender (β = -.211, p = .001), increasing age (β = .371, $p < .001$), less education (β = -.129, p = .040) and less household income (β = -.171, p = .006) all made notable contributions to predicting more negative health behaviors. Spirituality and extraversion were entered in Block 2, and accounted for an additional 1.3% of the variance (F change (2, 196) = 1.82, p = .166). Block 3 added the interaction of spirituality and extraversion, which accounted for an additional .4% of the variance. The final model explained 28.4% of the variance in negative health behaviors, with F(11, 195) = 7.03, $p < .001$. Spirituality was not a moderator in the relationship, with a non-significant interaction term (β = -.617, p = .321).

In examining the influence of religiosity as a moderator within the UNT student sample, the results should again be interpreted with caution. Block 1 included demographic variables which accounted for 26.7% of the variance in negative health behaviors (F (8, 198) = 9.01, $p < .001$). Male gender (β = -.211, p = .001), increasing age (β = .371, $p < .001$), decreased levels of education (β = -.129, p = .040) and less household income (β = -.171, p = .006) all made notable contributions to predicting more negative health behaviors. Religiosity and extraversion were entered in Block 2, and accounted for an additional 1.1% of the variance (F change (2, 196) = 1.53, p =

.220). Block 3 added the interaction of religiosity and extraversion, which accounted for an additional .2% of the variance. The final model explained 28% of the variance in negative health behaviors, with $F(11, 195) = 6.89$, $p < .001$. Religiosity did not act as a moderator in the relationship, with a non-significant interaction term ($\beta = .236$, $p = .511$).

Community Sample

Central research question: Does religiosity or spirituality contribute more to health behaviors?

Four hierarchical multiple regressions were used to determine whether religiosity or spirituality contributes more to health behaviors within the community sample, after controlling for the influence of demographic variables and order of entry into the analysis. Assumptions of the regression were all met via examination of scatterplot, histogram, and VIF/tolerance statistics. Gender, age, ethnicity, education and income were entered into Block 1 to predict positive health behaviors; these explained 18% of the variance in positive health behaviors ($F(7,109) = 3.47$, $p = .002$). Age ($\beta = .308$, $p = .002$) made a notable contribution to prediction with older individuals participating in more positive health behaviors. Spirituality (Block 2) added 11.9% variance accounted for (F change $(1, 108) = 18.48$, $p < .001$). Religiosity was added to Block 3 but did not explain a significant amount of variance above and beyond Spirituality (F change $(1, 107) = .287$, $p = .593$). The final model explained 30.4% of the variance in positive health behaviors, with $F(9, 107) = 5.18$, $p < .001$. Spirituality ($\beta = .312$, $p = .002$) was the only statistically significant predictor of positive health behaviors. Entering Religiosity in Block 2 (F change $(1, 111) = 7.51$, $p = .007$) explained 5.2% of the variance beyond the demographic variables, and entering Spirituality into Block 3 (F change $(1, 110) = 10.27$,

p = .002) explained an additional 7% of the variance. Altering the order of entry did not change results of the full model, as Spirituality continued to be the only significant predictor. In examining the bivariate correlations between spirituality and positive health behaviors (*r* = .372, *p* < .001) as well as religiosity and positive health behaviors (*r* = .331, *p* < .001), the inability of religiosity to significantly explain positive health behaviors may come from both variables accounting for similar aspects of positive health.

In examining the negative health behaviors of the Community sample, the demographic variables in Block 1 accounted for 17.1% of the variance in negative health behaviors (*F*(7,109) = 3.22, *p* = .004). Age (β = .223, *p* = .025), Other ethnicity (β = .262, *p* = .004) and household income (β = -.267, *p* = .009) all made notable contributions to prediction. Spirituality (Block 2) did not explain a significant amount of variance above and beyond the demographic variables (F change (1, 108) = .706, *p* = .403). Block 3 included Religiosity which accounted for 4.2% of the variance in negative health behaviors (F change (1, 107) = 5.82, *p* = .018). The final model explained 21.9% of the variance in negative health behaviors, with *F*(9, 107) = 3.34, *p* = .001. Religiosity (β = -.259, *p* = .018) appeared as the only predictor of negative health behaviors with less religious individuals participating in more negative health behaviors. Entering Religiosity in Block 2 (F change (1, 111) = 6.10, *p* = .015) rather than Spirituality which was entered into Block 3 (F change (1, 110) = .911, *p* = .342) did not alter these conclusions. See Tables 5 and 6 for summaries of the regressions. Bivariate correlations between spirituality and negative health behaviors were not significant, unlike the correlation between religiosity and negative health behaviors (*r* = -.197, *p* = .031).

Table 5

Regression Summary Predicting Positive Health Behaviors from Religiosity and Spirituality

		UNT Students (*n* = 207)			Community Sample (*n* = 120)		
		β	*t*	Sig.	β	*t*	Sig.
Gender		.065	.947	.345	.021	.258	.797
Age		.033	.468	.641	.291	3.15	.002
Ethnicity	African	-.120	-1.67	.096	--	--	--
	Asian	.000	.000	1.00	-.013	-.149	.881
	Hispanic	.029	.412	.681	.059	.697	.487
	Other	.061	.881	.379	-.069	-.835	.405
Education		.033	.475	.636	.097	1.16	.249
Household Income		.164	2.44	.016	.120	1.27	.206
Spirituality		.207	2.82	.005	.325	3.28	.001
Religiosity		.130	1.74	.084	.054	.536	.593

Note. Values reflect final model when Spirituality was entered in Block 2. For UNT students, R^2 = .130, Adjusted R^2 = .086, $F(10,196)$ = 2.94, *p* = .002. For Community sample, R^2 = .304, Adjusted R^2 = .245, $F(9,107)$ = 5.18, *p* < .001.

Table 6

Regression Summary Predicting Negative Health Behaviors from Religiosity and Spirituality

		UNT Students (*n* = 207)			Community Sample (*n* = 120)		
		β	*t*	Sig.	β	*t*	Sig.
Gender		-.202	-3.22	.001	-.084	-.969	.195
Age		.379	5.86	.000	.308	3.25	.007
Ethnicity	African	-.068	-1.04	.299	--	--	--
	Asian	-.130	-2.01	.046	-.110	-1.20	.232
	Hispanic	-.058	-.898	.370	-.125	-1.39	.166
	Other	.114	1.79	.075	.240	2.74	.007
Education		-.121	-1.90	.058	-.035	-.393	.695
Household Income		-.170	-2.77	.006	-.239	-2.39	.018
Spirituality		-.035	-.523	.602	.065	.617	.538
Religiosity		-.069	-1.01	.314	-.259	-2.41	.018

Note. Values reflect final model when Spirituality was entered in Block 2. For UNT students, R^2 = .274, Adjusted R^2 = .237, $F(10,196)$ = 7.40, $p <$ .001. For Community sample, R^2 = .219, Adjusted R^2 = .153, $F(9,107)$ = 3.34, p = .001.

Hypothesis 1: Extraversion will be positively correlated with religiosity and negatively correlated with spirituality.

Two hierarchical multiple regressions were used to test this hypothesis. Social support is a main difference between religion and spirituality, and as extraverts are more drawn to social interactions, they may also be more likely to follow a religious path.

Two hierarchical multiple regressions were again used to determine whether Extraversion would be associated with Religiosity or Spirituality after controlling for the influence of demographic variables. Assumptions of the first regression were all met via examination of scatterplot, histogram, and VIF/tolerance statistics. Demographic variables in Block 1 explained 5.1% of the variance in Spirituality ($F(7, 109) = .838$, $p = .558$). The addition of Extraversion to Block 2 further explained 5.6% of the variance (F change $(1, 108) = 6.82$, $p = .010$). The final model accounted for 10.7% of the variance in Spirituality. However, the final model was not significant ($F(8, 108) = 1.62$, $p = .126$), even though extraversion continued to be a notable predictor ($\beta = .252$, $p = .010$).

Regression assumptions were also met in examining the association of Religiosity and Extraversion. Demographic variables in Block 1accounted for 9% of the variance in Religiosity ($F(7, 109) = 1.53$, $p = .163$). Extraversion in Block 2 did not explain any more variance above and beyond the demographic variables (F change $(1, 108) = .034$, $p = .855$). The final model accounted for 9% of the variance in Religiosity, and the final model was not significant ($F(8, 108) = 1.33$, $p = .234$). Extraversion was not shown to be significantly associated with Religiosity ($\beta = .018$, $p = .855$). The variables were also not correlated ($r = -.023$, $p = .403$). Refer to Tables 7 and 8 for regression summaries.

Table 7

Regression Summary Predicting Spirituality from Extraversion

		UNT Students (*n* = 207)			Community Sample (*n* = 120)		
		β	*t*	Sig.	β	*t*	Sig.
Gender		-.019	-.291	.772	-.041	-.436	.664
Age		-.061	-.911	.364	.049	.477	.634
Ethnicity	African	.098	1.41	.159	--	--	--
	Asian	-.043	-.626	.532	-.213	-2.16	.033
	Hispanic	.004	.061	.951	-.113	-1.19	.235
	Other	.067	.997	.320	.045	.482	.631
Education		.146	2.19	.030	-.007	-.079	.937
Household Income		.058	.889	.375	-.019	-.176	.860
Extraversion		.364	5.51	.000	.252	2.61	.010

Note. Values reflect final model. For UNT students, R^2 = .172, Adjusted R^2 = .134, $F(9,197)$ = 4.54 , $p < .001$. For Community sample, R^2 = .107, Adjusted R^2 = .041, $F(8,108)$ = 1.62, p = .126.

Table 8

Regression Summary Predicting Religiosity from Extraversion

		UNT Students (*n* = 207)			Community Sample (*n* = 120)		
		β	*t*	Sig.	β	*t*	Sig.
Gender		.126	1.82	.071	-.033	-.346	.730
Age		.160	2.26	.025	.189	1.82	.072
Ethnicity	African	.133	1.84	.069	--	--	--
	Asian	-.066	-.914	.362	-.104	-1.05	.295
	Hispanic	-.107	-1.51	.134	.037	.386	.700
	Other	-.146	-2.07	.039	-.066	-.693	.490
Education		.050	.719	.473	-.035	-.371	.712
Household Income		-.004	-.055	.956	.112	1.04	.299
Extraversion		-.001	-.010	.992	.018	.184	.855

Note. Values reflect final model. For UNT students, R^2 = .089, Adjusted R^2 = .047, $F(9,197)$ = 2.13, p = .029. For Community sample, R^2 = .090, Adjusted R^2 = .023, $F(8,108)$ = 1.33, p = .234.

Hypothesis 2: Intrinsic religious orientation will be positively correlated with spirituality

Two hierarchical multiple regressions were used to determine whether religious orientation would be associated with Spirituality. Assumptions of the regression were all met. Demographic variables were entered into Block 1. These variables accounted for 5.1% of the variance in Spirituality although the effect was not statistically significant (F (7, 109) = .838, p = .558). Religious orientation was entered in Block 2 and explained an additional 23.1% of the variance (F change (1, 108) = 34.72, p < .001). The final model accounted for 28.2% of the variance in Spirituality, with F(8, 108) = 5.30, p < .001. Religious orientation was strongly associated with Spirituality (β = .503, p < .001). Correlations of religious orientation with Spirituality (r = .456, p < .001) indicate that with higher religious orientation scores (intrinsic orientation), Spirituality increased.

Similar results were produced for the Community sample in regards to the research question, examining whether religious orientation would be associated with religiosity. Assumptions of the regression were again met. Demographic variables were entered into Block 1, which accounted for 9% of the variance in Religiosity (F (7, 109) = 1.53, p = .163). Religious orientation was entered into Block 2 and added 54.4% explained variance beyond the demographic variables (F change (1, 108) = 160.20, p < .001). The final model accounted for 60.6% of the variance in Religiosity (F(8, 108) = 23.33, p < .001), with Religious orientation as a strong predictor (β = .772, p < .001). Religious orientation was also positively correlated with Religiosity (r = .770, p < .001), indicating that individuals with an intrinsic religious orientation were likely to be more religious. See Tables 9 and 10 for regression summaries.

Table 9

Regression Summary Predicting Spirituality from Religious Orientation

		UNT Students (*n* = 207)			Community Sample (*n* = 120)		
		β	*t*	Sig.	β	*t*	Sig.
Gender		-.032	-.469	.639	-.010	-.017	.662
Age		-.118	-1.69	.093	.001	.008	.802
Ethnicity	African	-.045	.617	.538	--	--	--
	Asian	-.027	-.386	.700	-.097	-1.12	.265
	Hispanic	.016	.234	.815	-.171	-2.01	.047
	Other	.030	.436	.663	.191	2.29	.024
Education		.136	1.98	.049	.021	.253	.801
Household Income		.024	.362	.718	-.007	-.075	.940
Religious Orientation		.304	4.30	.000	.503	5.58	.000

Note. Values reflect final model. For UNT students, R^2 = .126, Adjusted R^2 = .086, $F(9,197)$ = 3.16, p = .001. For Community sample, R^2 = .282, Adjusted R^2 = .229, $F(8,108)$ = 5.30, $p < .001$.

Table 10

Regression Summary Predicting Religiosity from Religious Orientation

		UNT Students (*n* = 207)			Community Sample (*n* = 120)		
		β	*t*	Sig.	β	*t*	Sig.
Gender		.037	.735	.463	.019	.311	.912
Age		.053	1.02	.308	.128	1.98	.069
Ethnicity	African	-.062	-1.14	.257	--	--	--
	Asian	-.049	-.946	.345	-.005	-.083	.934
	Hispanic	-.060	-1.16	.246	-.069	-1.14	.258
	Other	-.132	-2.61	.010	.080	1.34	.184
Education		.019	.380	.704	-.021	-.349	.728
Household Income		-.020	-.395	.693	.066	.979	.330
Religious Orientation		.702	13.46	.000	.772	12.66	.000

Note. Values reflect final model. For UNT students, R^2 = .525, Adjusted R^2 = .504, $F(9,197)$ = 24.22, $p < .001$. For Community sample, R^2 = .633, Adjusted R^2 = .606, $F(8,108)$ = 23.33, $p < .001$.

Hypothesis 3: Extraversion will be associated with religious orientation and be positively correlated with extrinsic religious orientation.

Hierarchical multiple regression was utilized to determine if Extraversion would be associated with an extrinsic religious orientation. After checking assumptions of the regression, demographic variables were entered into Block 1. These variables accounted for 8.9% of the variance in religious orientation (F (7, 109) = 1.51, p = .170). While the model was not significant, Other ethnicity (β = -.184, p = .049) was a notable predictor of religious orientation, with Caucasian individuals tending to have more intrinsic religious orientation. Extraversion was entered in Block 2 and did not account for any additional variance in religious orientation (F change (1, 108) = .200, p = .656). The final model explained 7.4% of the variance in religious orientation, with F(8, 108) = 1.34, p = .232. Extraversion (β = .044, p = .656) was again not a significant predictor of religious orientation. Refer to Table 11 for summaries of the regressions.

Hypothesis 4: Intrinsic religious orientation will be positively correlated with positive health behaviors.

Two hierarchical multiple regressions were used to determine whether an intrinsic religious orientation would be associated with positive health behaviors after controlling for the influence of demographic variables After checking assumptions of the regression, demographic variables were entered into Block 1. These variables accounted for 18.2% of the variance in positive health behaviors (F (7, 109) = 3.47, p = .002). Greater age (β = .308, p = .002) was a notable predictor of these behaviors. Religious orientation was entered in Block 2, not explaining any additional variance beyond the demographic variables (F change (1, 108) = 2.50, p = .117). The final model explained 20.1% of the variance in positive health behaviors, with F(8, 108) = 3.39, p =

.002. Although the model was significant, religious orientation (β = .142, *p* = .117) was not statistically associated with positive health behaviors. See Table 12 for regression summaries.

The Community sample reported different results from the student sample in regards to the research question which examined whether religious orientation would be associated with negative health behaviors. After checking assumptions of the regression, which again should be interpreted with caution, demographic variables were entered into Block 1. Demographics accounted for 17.1% of the variance in negative health behaviors (*F* (7, 109) = 3.22, *p* = .004). Greater age (β = .223, *p* = .025), Other ethnicity (β = .262, *p* = .004) and lower household income (β = -.267, *p* = .009) were notable predictors of more negative health behaviors. Religious orientation was entered into Block 2, which accounted for an additional 4.0% of the variance (F change (1, 108) = 5.54, *p* = .020). The final model explained 21.2% of the variance in negative health behaviors, with *F*(8, 108) = 3.63, *p* = .001. Within this sample, religious orientation was significantly associated with negative health behaviors (β = -.211, *p* = .020) indicating that with lower religious orientation scores (extrinsic orientation), negative health behaviors increased. A negative correlation existed between religious orientation and negative health behaviors (*r* = -.236, *p* = .005). Refer to Table 13 for regression summaries.

Table 11

Regression Summary Predicting Religious Orientation from Extraversion

		UNT Students (*n* = 207)			Community Sample (*n* = 120)		
		β	*t*	Sig.	β	*t*	Sig.
Gender		.126	1.84	.068	-.049	-.520	.604
Age		.153	2.19	.030	.090	.870	.386
Ethnicity	African	.275	3.85	.000	--	--	--
	Asian	-.024	-.339	.735	-.133	-1.34	.183
	Hispanic	-.067	-.954	.341	.137	1.43	.155
	Other	-.018	-.262	.793	-.193	-2.04	.044
Education		.044	.640	.523	-.020	-.212	.833
Household Income		.024	.349	.728	.056	.522	.603
Extraversion		.014	.212	.832	.044	.447	.656

Note. Values reflect final model. For UNT students, R^2 = .114, Adjusted R^2 = .074, $F(9,197)$ = 2.83, p = .004. For Community sample, R^2 = .090, Adjusted R^2 = .023, $F(8,108)$ = 1.34, p = .232.

Table 12

Regression Summary Predicting Positive Health Behaviors from Religious Orientation

		UNT Students (*n* = 207)			Community Sample (*n* = 120)		
		β	*t*	Sig.	β	*t*	Sig.
Gender		.069	.980	.328	.006	.073	.942
Age		.023	.318	.751	.296	3.04	.003
Ethnicity	African	-.105	-1.38	.169	--	--	--
	Asian	-.013	-.181	.857	-.053	-.575	.567
	Hispanic	.021	.292	.771	.008	.091	.928
	Other	.049	.694	.488	-.014	-.158	.875
Education		.066	.926	.356	.102	1.14	.256
Household Income		.168	2.41	.017	.125	1.25	.213
Religious Orientation		.105	1.44	.153	.142	1.58	.117

Note. Values reflect final model. For UNT students, R^2 = .065, Adjusted R^2 = .023, $F(9,197)$ = 1.53, *p* = .140. For Community sample, R^2 = .201, Adjusted R^2 = .142, $F(8,108)$ = 3.39, *p* = .002.

Table 13

Regression Summary Predicting Negative Health Behaviors from Religious Orientation

		UNT Students (*n* = 207)			Community Sample (*n* = 120)		
		β	*t*	Sig.	β	*t*	Sig.
Gender		-.198	-3.17	.002	-.120	-1.38	.171
Age		.386	6.06	.000	.241	2.49	.014
Ethnicity	African	-.053	-.798	.426	--	--	--
	Asian	-.127	-1.97	.050	-.120	-1.32	.189
	Hispanic	-.057	-.896	.372	-.112	-1.25	.213
	Other	.121	1.94	.054	.224	2.55	.012
Education		-.125	-2.00	.047	-.029	-.324	.747
Household Income		-.169	-2.75	.006	-.254	-2.56	.012
Religious Orientation		-.103	-1.60	.111	-.211	-2.35	.020

Note. Values reflect final model. For UNT students, R^2 = .276, Adjusted R^2 = .243, $F(9,197)$ = 8.36, $p < .001$. For Community sample, R^2 = .212, Adjusted R^2 = .153, $F(8,108)$ = 3.63, $p < .001$.

Hypothesis 5: Spirituality and religiosity act as moderators of the relationship between extraversion and negative health behaviors.

The fifth and final hypothesis that spirituality and religiosity would act as moderators in the relationship between extraversion and negative health behaviors was analyzed using two hierarchical multiple regression models. The results for the community sample should also be interpreted with caution due to the non-normality of the negative health behaviors. In examining spirituality as a moderator, demographic variables were entered into Block 1. These variables explained 17.1% of the variance in negative health behaviors ($F(7, 109) = 3.22$, $p = .004$). Increasing age ($\beta = .223$, $p = .025$), holding an "Other" ethnicity ($\beta = .262$, $p = .004$) and less household income ($\beta = -.267$, $p = .009$) were notable predictors of increased negative health behaviors. Block 2 included spirituality and extraversion, which accounted for a non-significant additional .9% of variance (F change $(2, 107) = .607$, $p = .547$). The interaction of spirituality and extraversion was added to Block 3 and did not account for any additional variance beyond the first two blocks. The final model explained 18.1% of the variance in negative health behaviors, with $F(10, 106) = 2.34$, $p = .016$. Similar to the UNT student sample, the Spirituality was not a moderator for this relationship, with the interaction term being non-significant ($\beta = -.245$, $p = .886$).

In examining the influence of religiosity as a moderator within the Community sample, the results should again be interpreted with caution. Block 1 included demographic variables which accounted for 17.1% of the variance in negative health behaviors ($F(7, 109) = 3.22$, $p = .004$). Increasing age ($\beta = .223$, $p = .025$), holding an "Other" ethnicity ($\beta = .262$, $p = .004$) and decreased household income ($\beta = -.267$, $p = .009$) made notable contributions to prediction. Religiosity and extraversion were

53

entered in Block 2, and accounted for an additional 4.7% of the variance (F change (2,

107) = 3.23, p = .043). Block 3 added the interaction of religiosity and extraversion,

which accounted for a non-significant additional .5% of the variance. The final model

explained 22.4% of the variance in negative health behaviors, with $F(10, 106)$ = 3.05, p

= .002. Religiosity did not act as a moderator, with a non-significant interaction term (β =

.404, p = .406). See Tables 14 and 15 for regression summaries.

Discussion

Demographics

The demographic variables of age, gender, ethnicity, income, and education

were influential in each analysis. In analyses examining negative health behaviors, the

demographic variables were effective in explaining variability. For both samples,

variance explained ranged from 18-27%, with increased age and male gender showing

the strongest prediction of negative health. Positive health behaviors were not quite as

influenced by these variables, with demographics explaining 6-18% of variance. Greater

income and older age were notable predictors of positive health. The dependent

variable least affected by demographic variables was spirituality, in which higher

education level explained about 4% of the variable in each sample. Demographic

variables accounted for 7-11% variance in each analysis examining religiosity and

religious orientation. Notable predictors for these variables included Caucasian

ethnicity, African-American ethnicity and older age.

Table 14

Regression Summary Moderating Negative Health Behaviors of Extraverts with Spirituality

		UNT Students (*n* = 207)			Community Sample (*n* = 120)		
		β	*t*	Sig.	β	*t*	Sig.
Gender		-.221	-3.56	.000	-.111	-1.22	.227
Age		.363	5.73	.000	.234	2.34	.021
Ethnicity	African	-.080	-1.24	.218	--	--	--
	Asian	-.132	-2.06	.041	-.127	-1.26	.211
	Hispanic	-.054	-.840	.402	-.155	-1.68	.096
	Other	.136	2.16	.032	.259	2.81	.006
Education		-.115	-1.82	.071	-.029	-.319	.750
Household Income		-.158	-2.56	.011	-.280	-2.64	.009
Spirituality		.157	.589	.557	-.042	-.119	.906
Extraversion		.581	1.21	.226	.169	.240	.811
Spirituality x Extraversion		-.617	-.995	.321	-.122	-.144	.886

Note. Values reflect final model. For UNT students, R^2 = .284, Adjusted R^2 = .243, $F(11,195)$ = 7.03, $p < .001$. For Community sample, R^2 = .181, Adjusted R^2 = .103, $F(10,106)$ = 2.33, p = .016.

Table 15

Regression Summary Moderating Negative Health Behaviors of Extraverts with Religiosity

		UNT Students (*n* = 207)			Community Sample (*n* = 120)		
		β	*t*	Sig.	β	*t*	Sig.
Gender		-.205	-3.27	.001	-.107	-1.22	.225
Age		.387	6.05	.000	.264	2.68	.009
Ethnicity	African	-.078	-1.20	.232	--	--	--
	Asian	-.129	-2.00	.047	-.109	-1.15	.255
	Hispanic	-.054	-.841	.401	-.133	-1.49	.139
	Other	.115	1.80	.073	.248	2.77	.007
Education		-.128	-2.04	.042	-.043	-.484	.630
Household Income		-.169	-2.74	.007	-.236	-2.30	.024
Religiosity		-.264	-.934	.351	-.528	-1.40	.164
Extraversion		-.069	-.309	.757	-.214	-.651	.517
Religiosity x Extraversion		.236	.659	.511	.404	.834	.406

Note. Values reflect final model. For UNT students, R^2 = .280, Adjusted R^2 = .239, $F(11,195)$ = 6.89, $p < .001$. For Community sample, R^2 = .224, Adjusted R^2 = .150, $F(10,106)$ = 3.05, p = .002.

These findings support previous research which has found that increased resources such as money, education level, and SES allow individuals to take better care of themselves physically, emotionally, and mentally (Deaton, 2003). These resources allow the possibility of better health, however being successful in obtaining these resources does not necessarily lead to engagement in positive health behaviors.

Older age was a statistically significant predictor of both negative and positive health behaviors. One explanation for this finding may be the link between age and gender, and age and income level. Older males reported engaging in negative behaviors while older individuals with more income reported engaging in positive behaviors. Previous research has shown that males tend to engage in more negative health behaviors (Langhinrichsen-Rohling, Lewinsohn, Rohde, Seeley, Monson, Meyer, & Langford, 1998) and income is a basic resource for obtaining higher socio-economic status, leading to the possibility for more positive health behaviors (Deaton, 2003).

Central Research Question

The central research question of whether religiosity or spirituality contributes more to health behaviors provided notable results. Spirituality was able to predict positive health behaviors beyond religiosity in both samples. This conflicted with several studies supporting a relationship between positive health behaviors and increased religiosity (Gillum & Dupree, 2007; Benjamins, 2007; Koenig, et. al, 1999; Levin, 1996; McCllough, 1995). The relatively low levels of reported religiosity for both samples in the present study (3.76 for student sample and 4.05 for community sample, out of a response range of 2-6) may have influenced these conflicting results.

Most religions also do not offer a guide on how to live a healthy life, rather most suggest what negative health behaviors *not* to indulge in. Spirituality on the other hand provides suggestions on yoga, meditation, and additional positive health behaviors. Results of this study suggest that the desire to live a healthy lifestyle may be supported more by choosing a spiritual path rather than a religious path, which supports some previous research (Park, et. al, 2009; Nagel & Sgoutas-Emch, 2007). Nagel and Sgoutas-Emch (2007) used a similar sample as well as similar spirituality and health behavior measures in their study. The study by Park et.al (2009) examined the influences of both religiosity and spirituality separately, but utilized a specific, restrictive sample of cancer survivors. The present study appeared to both extend previous findings (Nagel & Sqoutas-Emch, 2007) and provide new information on healthy samples, examining the different influences religiosity and spirituality have on positive health behaviors in one study.

For negative health behaviors the findings differed between samples. While spirituality failed to predict these behaviors in either sample, religiosity was able to predict negative health behaviors for the Community sample. Correlations between religiosity and negative health behaviors show that the more religious an individual is the less likely they are to engage in negative health behaviors. This supports previous findings by many researchers (Krause, 2011; Maltby, Lewis, Freeman, Day, Cruise, and Breslin, 2010; Seybold and Hill, 2001). The difference between samples may be due to differing social environments. Social environments surrounding most college students are typically filled with more peer pressure than a general "community" environment. The difference between the samples in regards to prediction of certain behaviors by

religious/spiritual beliefs may be primarily due to age. Younger adults in a college setting are typically more likely to engage in negative health behaviors. Also, parents tend to maintain influence over their children's religious beliefs as young adults, and while many students reported having religious beliefs, they may not truly hold them.

Positive and negative health behaviors were not significantly correlated in either sample. While it would seem that those who engage in more positive health behaviors would also engage in fewer negative behaviors, this is not necessarily the case (Stefansdottir & Vilhjalmsson, 2007; Park, Edmondson, Fenster, & Blank, 2008). For example, many individuals choose to exercise and eat healthy foods during the week so they may consume alcohol and engage in more negative health behaviors on the weekends.

Overall, spirituality appears to be more useful for understanding positive health behaviors while religiosity is more useful for predicting negative health behaviors. Individuals who are highly spiritual and religious may combine both patterns, having lives which follow positive health behaviors and avoid negative health behaviors.

Hypothesis 1

The first hypothesis, that extraversion would be positively correlated with religiosity and negatively correlated with spirituality, was not supported in either sample. Within both samples, extraversion predicted spirituality but did not predict religiosity. This contradicts common thinking in that with social support as a key difference between religion and spirituality, and because extraverts are more drawn to social interactions, they should also be more likely to follow a *religious* than a spiritual path.

59

This does however support findings by Maltby and Day (2001) who found extraversion to be linked to spirituality. They noted that characteristics commonly associated with extraversion such as optimism and sensation-seeking could explain their results. This explanation may also be true for the samples in the present study, as the optimism and sensation-seeking components of extraversion may lead individuals to seek out a less regulated, internal belief system such as spirituality. However, if spirituality increases with extraversion, and many studies have shown negative health behaviors to increase with extraversion, negative health behaviors might also be expected to increase with spirituality. This was not the case in the present study (see central research question). The aspects of extraversion which may be linked to spirituality may be different from those aspects linked to negative health behaviors.

Hypothesis 2

Hypothesis 2 stated that intrinsic religious orientation would be associated with greater spirituality. Religious orientation was associated with spirituality in both samples, and the correlations between religious orientation and spirituality were supportive of the hypothesis. A more intrinsic orientation indicated higher spirituality, supporting current findings (Berkel, Armstrong, & Cokley, 2004). Spiritual measures utilized in the present study and by Berkel et al. (2004) reflected both similar facets of spiritualty (spiritual beliefs, characteristics) and different (the inclusion of environmental/nature concerns in the present study). This study may then extend previous findings of the relationship between spirituality and religious orientation through defining spirituality in different ways. This relationship may also further demonstrate how religious orientation can be

applied to both spiritual and religious individuals.

The additional research question in connection with hypothesis 2 examined whether religious orientation was associated with religiosity. Both the student and community samples found that religious orientation was linked to religiosity with a positive correlation. An extrinsic religious orientation indicated lower religiosity, which was supportive of previous findings (Allport & Ross, 1967; Milevsky & Levitt, 2004).

Hypothesis 3

Hypothesis 3 stated that extraversion would be associated with extrinsic religious orientation. This hypothesis was not supported in either sample. Extrinsic religious orientation has been shown to share certain characteristics with extraversion such as individual prejudices and sociability (Allport & Ross, 1967; McCrae & John, 1992). Previous research has also shown extraversion to be predictive of extrinsic religious orientation (Francis, Robbins & Murray, 2010). Discrepancies among previous research and the present study may be due to characteristics of the samples. Previous studies utilized samples of Christian adults (Francis, Robbins & Murray, 2010) where this study examined college students and adults of likely varying religious/spiritual beliefs.

Hypothesis 4

The fourth hypothesis examined the link between positive health behaviors and intrinsic religious orientation. The hypothesis was not supported in either sample. Although intrinsic religious orientation has been linked to predicting many positive health behaviors (Homan & Boyatzis, 2010; Masters & Knestel, 2011), this study attempted to

extend the generalizability to younger samples and additional health behaviors. Both of the previously noted studies examined older samples with mean ages of 48 and 75, respectively. The present study reported mean ages of 22 for the student sample and 31 for the community sample. Older individuals may have a stronger sense of their spiritual/ religious beliefs. In examining additional health behaviors, the study by Masters and Knestel (2011) only examined smoking, alcohol consumption, and exercise. The present study included many more positive and negative health behaviors.

In examining the research question made in connection to the fourth hypothesis, extrinsic orientation was associated with negative health behaviors in the community sample, but not in the student sample. Significant negative correlations between negative health behaviors and religious orientation within the community sample indicated that an extrinsic orientation was linked to more negative behaviors. The social characteristics of holding an extrinsic religious orientation may be an explanation for this finding. The difference in results between the two samples may be due to individuals in the community sample reporting higher levels of religiosity. Individuals attempting to reduce their negative health behaviors may do so by attempting to move toward intrinsically oriented religious beliefs.

Hypothesis 5

The fifth and final hypothesis examined spirituality and religiosity acting as moderators between extraversion and negative health behaviors. Previous research has found that participating in religious acts can reduce negative health behaviors (Gillum &

Dupree, 2007; Benjamins, 2007). While many studies have found that extraverts are more likely than introverts to engage in negative health behaviors (Vollrath & Torgersen, 2008; Raynor &Levine, 2009; Hong & Paunonen, 2009), some studies have also found that this is not the case (Torgersen & Vollrath, 2006). Results from previous hypotheses within this study demonstrated that extraverts did not show a link to negative health behaviors. Therefore, there was no relationship to moderate and no results could be found for the fifth hypothesis. Extraverts in the present study may not have shown a significant correlation to negative health behaviors due to the interplay between extraversion and other personality factors, such as conscientiousness. Examining the influence of multiple personality factors (Torgersen & Vollrath, 2006) may have altered results of this hypothesis (i.e., individuals high in extraversion and low in conscientiousness). Another explanation may be sample characteristics. Previous studies utilized samples of college students with multiple majors including athletes, business, and psychology. Students with majors such as athletics and business may be more inclined to engage in negative health behaviors than psychology majors due to the cultures of those majors.

Conclusions

The present study has both extended previous research and provided new insights. The connection between spirituality and positive health behaviors was extended to healthy samples and the differing influences religiosity and spirituality have on health behaviors for healthy individuals had previously not been examined in one study. This study also supported a new insight in that the reduction of negative health

63

behaviors with increased religiosity does not necessarily lead those individuals to engage in more positive health behaviors. The link between religion and negative health behaviors, as well as between spirituality and positive health behaviors provides more evidence for the separation of religion and spirituality.

A connection between extrinsic religious orientation and negative health behaviors was a relatively new finding, and it added support to the connection between religiosity and negative health behaviors. Previous studies had not focused on specific health behaviors, and only found links between intrinsic religious orientation and positive health behaviors. The connection between religious orientation and spirituality was extended in the present study to include different aspects of spirituality. An intrinsic religious orientation and spirituality may share an increased connection to nature and the environment.

Future Directions and Limitations

Limitations of this study include sample characteristics such as size and major, the absence of atheist/ agnostic individuals, the non-measurement of the religious quest orientation, non-normality of the negative health behaviors variable and a lack of inquiry of membership to a religious group. Future directions for research conducted on these variables include gathering a larger number of participants from varying majors so as to maximize generalizability. Community participants recruited via internet websites other than social media sites may also increase generalizability as individuals utilizing these sites tend to be younger. Health behaviors and personality traits should also be examined for those who do not believe in a higher power (atheist/agnostic), as they may

serve as a sort of "base-line" standard for religious and spiritual individuals. The Quest

orientation was not measured in this study, although it has more recently been noted as

an important part of religious orientation (Batson & Ventis, 1982; Francis 2007).

Finally, inclusion of religious membership may provide additional insights for

examination of these variables.

REFERENCES

AIDS Healthcare Foundation. (2008). *HIV/AIDS*. Retrieved from
　　　　http://www.aidshealth.org /about-hiv-aids/hiv-aids/.

Agency for Healthcare Research and Quality. (n.d.). *Talk with your doctor*. Retrieved
　　　　from http://www.ahrq.gov/healthymen/discuss.htm

Al-Kandari, F., Vidal, V. L., & Thomas, D. (2008). Health-promoting lifestyle and body
　　　　mass index among College of Nursing students in Kuwait: A correlational study.
　　　　Nursing & Health Sciences, *10*(1), 43-50. doi:10.1111/j.1442-2018.2007.00370.x

Allport, G. W., & Ross, J. M. (1967). Personal religious orientation and prejudice.
　　　　Journal of Personality and Social Psychology, 5(4), 432-443.

Agency for Healthcare Research and Quality (2012). Talk with Your Doctor. Retrieved
　　　　from http://www.ahrq.gov/patients-consumers/patient-involvement/healthy-
　　　　men/doctor/index.html

Banks, R. (1980). Health and spiritual dimensions: Relationships and implications for
　　　　professional preparation programs. *Journal of School Health, 50*, 195-202.

Barrett, C. E., & Roesch, S. C. (2009). Evaluating the relationship between the five
　　　　factor model of personality and religious orientation. *Journal of Psychology and
　　　　Christianity, 28*(3), 195-199. Retrieved from EBSCOhost.

Begg, D., & Langley, J. (2001). Changes in risky driving behavior from age 21 to 26
　　　　years. *Journal of Safety Research*, *32*(4), 491-499. doi:10.1016/S0022-
　　　　4375(01)00059-7

Benjamins, M. R. (2007). Predictors of preventive health care use among middle-aged
　　　　and older adults in Mexico: The role of religion. *Journal of Cross-Cultural
　　　　Gerontology, 22*(2), 221-234. doi:10.1007/s10823-007-9036-4.

Berkel, L. A., Armstrong, T. D., & Cokley, K. O. (2004). Similarities and differences
　　　　between religiosity and spirituality in African American college students: A
　　　　preliminary investigation. *Counseling and Values*, *49*(1), 2-26. Retrieved from
　　　　EBSCOhost.

Berwick, D. (2011). Prevention just makes sense. Retrieved from
　　　　http://blog.medicare.gov /2011/06/20/prevention-just-makes-sense/.

Brannick, M. T. (2007). *Diagnostics*. Retrieved in January, 2013 from
　　　　http://luna.cas.usf.edu/~mbrannic/files/regression/Diagnostics.html.

Branje, S. T., Van Lieshout, C. M., & Gerris, J. M. (2007). Big Five personality
　　　　development in adolescence and adulthood. *European Journal of Personality,
　　　　21*(1), 45-62. doi:10.1002/per.596

Burstein, G. R., Lowry, R., Klein, J. D., & Santelli, J. S. (2003). Missed opportunities for sexually transmitted diseases, human immunodeficiency virus, and pregnancy prevention services during adolescent health Supervision Visits. *Pediatrics, 111*(5), 996-1002.

Carlson, E. N., Vazire, S., & Oltmanns, T. F. (2011). You probably think this paper's about you: Narcissists' perceptions of their personality and reputation. *Journal of Personality and Social Psychology*, *101*(1), 185-201. doi:10.1037/a0023781

Centers for Disease Control and Prevention. (2011). *Youth Risk Behavior Survey*. Retrieved from www.cdc.gov/yrbs.

Chandler, C. K., Holden, J. M., & Kolander, C. A. (1992). Counseling for spiritual wellness: Theory and practice. *Journal of Counseling and Development*, *71*(1), 168-175.

Chlewinski, Z. (1981). Personality and attitude toward religion in Poland. *Personality and Individual Differences, 2*(3), 243-245. doi:10.1016/0191-8869(81)90029-5

Cohen, J. (1988). *Statistical power analysis* (2nd ed.). Hillsdale NJ: Erlbaum.

Constant, A., Salmi, L., Lafont, S., Chiron, M., & Lagarde, E. (2009). Road casualties and changes in risky driving behavior in France between 2001 and 2004 among participants in the GAZEL cohort. *American Journal of Public Health*, *99*(7), 1247-1253. doi:10.2105/AJPH.2007.126474

Costa, P. T., & McCrae, R. R. (1992). The five-factor model of personality and its relevance to personality disorders. *Journal of Personality Disorders, 6*(4), 343-359. Retrieved from EBSCOhost.

Danbolt, L. J., Møller, P., Lien, L., & Hestad, K. A. (2011). The personal significance of religiousness and spirituality in patients with schizophrenia. *International Journal for the Psychology of Religion, 21*(2), 145-158. doi:10.1080/10508619.2011.557009

Davis, T. L., Kerr, B. A., & Kurpius, S. (2003). Meaning, purpose, and religiosity in at-risk youth: The relationship between anxiety and spirituality. *Journal Of Psychology And Theology*, *31*(4), 356-365.

Deaton, A. (2003). Health, income, and inequality. The National Bureau of Economic Research. Retrieved from http://www.nber.org/reporter/spring03/health.html.

Desai, M. N., Miller, W. C., Staples, B., & Bravender, T. (2008). Risk factors associated with overweight and obesity in college students. *Journal of American College Health*, *57*(1), 109-114. doi:10.3200/JACH.57.1.109-114

Dezutter, J., Soenens, B., Luyckx, K., Bruyneel, S., Vansteenkiste, M., Duriez, B., & Hutsebaut, D. (2009). The role of religion in death attitudes: Distinguishing

between religious belief and style of processing religious contents. *Death Studies*, *33*(1), 73-92. doi:10.1080/07481180802494289

Dy-Liacco, G. S., Piedmont, R. L., Murray-Swank, N. A., Rodgerson, T. E., & Sherman, M. F. (2009). Spirituality and religiosity as cross-cultural aspects of human experience. *Psychology of Religion and Spirituality, 1*(1), 35-52. doi:10.1037/a0014937

Ehrhart, K., Roesch, S. C., Ehrhart, M. G., & Kilian, B. (2008). A test of the factor structure equivalence of the 50-item IPIP five-factor model measure across gender and ethnic groups. *Journal of Personality Assessment, 90*(5), 507-516. doi:10.1080/00223890802248869

Ensel, W. M., & Lin, N. (1991). The life stress paradigm and psychological distress. *Journal of Health and Social Behavior, 32*, 321–341.

Everett Jones, S., Anderson, K., Lowry, R., Conner, H. (2011). Risks to health among American Indian/Alaska Native high school students in the United States. *Preventing Chronic Disease*, *8*(4), A76. http://www.cdc.gov/pcd/issues/2011/jul/10_0193.htm.

Francis, L. J., & Bourke, R. (2003). Personality and religion: Applying Cattell's model among secondary school pupils. *Current Psychology, 22*(2), 125-137. doi:10.1007/s12144-003-1003-9

Francis, L. J., & Robbins, M. (2008). Psychological type and prayer preferences: A study among Anglican clergy in the United Kingdom. *Mental Health, Religion & Culture*, *11*(1), 67-84. doi:10.1080/13674670701619445

Francis, L. J., Robbins, M., & Murray, L. (2010). Psychological type and religious orientation: Do introverts and extraverts go to church for different reasons?. *Mental Health, Religion & Culture, 13*(7-8), 821-827. doi:10.1080/13674670802207496

Friedman, H. S., Tucker, J. S., Schwartz, J. E., Tomlinson-Keasey, C., Martin, L. R., Wingard, D. L., & Criqui, M. H. (1995). Psychosocial and behavioral predictors of longevity: The aging and death of the 'termites.'. *American Psychologist*, *50*(2), 69-78. doi:10.1037/0003-066X.50.2.69

Gill, C. S., Barrio Minton, C. A., & Myers, J. E. (2010). Spirituality and religiosity: Factors affecting wellness among low-income, rural women. *Journal of Counseling & Development*, *88*(3), 293-302. Retrieved from EBSCO*host*.

Gillum, R. F., & Dupree, N. (2007). Religiousness, health, and health behavior in public-use data of the National Center for Health Statistics. *Journal of Religion and Health, 46*(1), 155-165. doi:10.1007/s10943-006-9083-0

Goldberg, L. R. (1999). A broad-bandwidth, public domain, personality inventory measuring the lower-level facets of several five-factor models. In I. Mervielde, I. Deary, F. De Fruyt, & F. Ostendorf (Eds.), *Personality psychology in Europe*, Vol. 7 (pp. 7-28). Tilburg, The Netherlands: Tilburg University Press.

Gordon, K., Frousakis, N. N., Dixon, L. J., Willett, J. M., Christman, J. A., Furr, R. E., & Hellmuth, J. C. (2008). Intrinsic/extrinsic religious orientation, forgiveness, and the role of social pressure. *Journal of Psychology and Christianity*, *27*(4), 311-319. Retrieved from EBSCO*host*.

Gorsuch, R. L., & McPherson, S. E. (1989). Intrinsic/Extrinsic Measurement: I/E – revised and single-item scales. *Journal for the Scientific Study of Religion, 28*(3), 348-354.

Harding, S. R., Flannelly, K. J., Weaver, A. J., & Costa, K. G. (2005). The influence of religion on death anxiety and death acceptance. *Mental Health, Religion & Culture*, *8*(4), 253-261. doi:10.1080/13674670412331304311

Heaven, P. L., & Bucci, S. (2001). Right-wing authoritarianism, social dominance orientation and personality: An analysis using the IPIP measure. *European Journal of Personality, 15*(1), 49-56. doi:10.1002/per.389

Hill, P. C., Pargament, K. I., Hood, R. r., McCullough, M. E., Swyers, J. P., Larson, D. B., & Zinnbauer, B. J. (2000). Conceptualizing religion and spirituality: Points of commonality, points of departure. *Journal for the Theory of Social Behaviour, 30*(1), 51-77. doi:10.1111/1468-5914.00119.

Homan, K. J., & Boyatzis, C. J. (2010). Religiosity, sense of meaning, and health behavior in older adults. *International Journal for the Psychology of Religion, 20*(3), 173-186. doi:10.1080/10508619.2010.481225.

Hong, R. Y., & Paunonen, S. V. (2009). Personality traits and health-risk behaviours in university students. *European Journal of Personality, 23*(8), 675-696. doi:10.1002/per.736

Howden, J. W. (1993, July). Development and psychometric characteristics of the Spirituality Assessment Scale. *Dissertation Abstracts International, 54*.

John, O. P., Donahue, E. M., & Kentle, R. L. (1991). *The Big Five Inventory--Versions 4a and 54*. Berkeley, CA: University of California,Berkeley, Institute of Personality and Social Research.

Johnstone R. L. (2004). *Religion in society: a sociology of religion* (7th edn). Pearson Education, Upper Saddle River, NJ.

Jurkovic, D., & Walker, G. A. (2006). Examining masculine gender-role conflict and stress in relation to religious orientation and spiritual well-being in Australian men. *The Journal Of Men's Studies*, *14*(1), 27-46. doi:10.3149/jms.1401.27

Koenig, H. G., Hays J. C., Larson D. B., George, L. K., Cohen H. J., McCllough, M. E., Meador, K. G., & Blazer, D. G. (1999). Does religious attendance prolong survival? A six-year follow-up study of 3,968 older adults. *J Gerontology, 54*(A), 370-376.

Krause, N. (2011). Religion and health: Making sense of a disheveled literature. *Journal of Religion and Health*, *50*(1), 20-35. doi:10.1007/s10943-010-9373-4

Kristiansen, C. M. (1985). Value correlates of preventive health behavior. *Journal of Personality and Social Psychology, 49*(3), 748-758. doi:10.1037/0022-3514.49.3.748

Kudel, I., Cotton, S., Szaflarski, M., Holmes, W. C., & Tsevat, J. (2011). Spirituality and religiosity in patients with HIV: A test and expansion of a model. *Annals of Behavioral Medicine, 41*(1), 92-103. doi:10.1007/s12160-010-9229-x

Langhinrichsen-Rohling, J., Lewinsohn, P., Rohde, P., Seeley, J., Monson, C. M., Meyer, K. A., & Langford, R. (1998). Gender differences in the suicide-related behaviors of adolescents and young adults. *Sex Roles, 39*(11-12), 839-854. doi:10.1023/A:1018824621193

Levin, J. S. (1996). How religion influences morbidity and health: Reflections on natural history, salutogenesis and host resistance. *Social Science & Medicine, 43*, 849–864.

Lewis, C., Maltby, J., & Day, L. (2005). Religious orientation, religious coping and happiness among UK adults. *Personality and Individual Differences, 38*(5), 1193-1202. doi:10.1016/j.paid.2004.08.002

Maltby, J., & Day, L. (2001). The relationship between spirituality and Eysenck's personality dimensions: A replication among English adults. *Journal of Genetic Psychology*, *162*(1), 119-122. doi:10.1080/00221320109597884.

Maltby, J., & Lewis, C. (1996). Measuring intrinsic and extrinsic orientation toward religion: Amendments for its use among religious and non-religious samples. *Personality and Individual Differences, 21*(6), 937-946. doi:10.1016/S0191-8869(96)00154-7

Maltby, J., Lewis, C., Freeman, A., Day, L., Cruise, S., & Breslin, M. J. (2010). Religion and health: The application of a cognitive-behavioural framework. *Mental Health, Religion & Culture*, *13*(7-8), 749-759. doi:10.1080/13674670802596930

Masters, K. S. (2008). Mechanisms in the relation between religion and health with emphasis on cardiovascular reactivity to stress. *Research in the Social Scientific Study of Religion*, 1991-115. doi:10.1163/ej.9789004166462.i-299.29

Masters, K. S., & Knestel, A. (2011). Religious orientation among a random sample of community-dwelling adults: Relations with health status and health-relevant

behaviors. *International Journal for the Psychology of Religion, 21*(1), 63-76. doi:10.1080/10508619.2011.532450

McCullough, M. E. (1995). Prayer and health: Conceptual issues, research review, and research agenda. *Journal of Psychology and Theology, 23*, 15-29.

McCrae, R. R., & John, O. P. (1992). An introduction to the five-factor model and its applications. *Journal of Personality*, *60*(2), 175-215. doi:10.1111/j.1467-6494.1992.tb00970.x

Milevsky, A., & Levitt, M. J. (2004). Intrinsic and extrinsic religiosity in preadolescence and adolescence: Effect on psychological adjustment. *Mental Health, Religion & Culture*, *7*(4), 307-321. doi:10.1080/13674670410001702380

Miller, G. (1999). The development of the spiritual focus in counseling and counselor education. *Journal of Counseling & Development, 77*, 498-501.

Miller, C. H., & Quick, B. L. (2010). Sensation seeking and psychological reactance as health risk predictors for an emerging adult population. *Health Communication*, *25*(3), 266-275. doi:10.1080/10410231003698945

Nagel, E., & Sgoutas-Emch, S. (2007). The relationship between spirituality, health beliefs, and health behaviors in college students. *Journal of Religion and Health, 46*(1), 141-154. doi:10.1007/s10943-006-9088-8.

Nelms, L., Hutchins, E., Hutchins, D., & Pursley, R. J. (2007). Spirituality and the health of college students. *Journal of Religion and Health*, *46*(2), 249-265. doi:10.1007/s10943-006-9075-0

Newberg, A., D'Aquili, E., & Rause, V. (2001). *Why god won't go away: Brain science and the biology of belief*. New York: Ballantine Books.

Nichols, L. M., & Hunt, B. (2011). The significance of spirituality for individuals with chronic illness: Implications for mental health counseling. *Journal of Mental Health Counseling, 33*(1), 51-66. Retrieved from EBSCOhost.

Østergaard, J. N., Grønbæk, M. M., Schnohr, P. P., Sørensen, T., & Heitmann, B. L. (2010). Combined effects of weight loss and physical activity on all-cause mortality of overweight men and women. *International Journal of Obesity*, *34*(4), 760-769. doi:10.1038/ijo.2009.274

Park, C. L. (2007). Religiousness/spirituality and health: A meaning systems perspective. *Journal of Behavioral Medicine, 30*(4), 319-328. doi:10.1007/s10865-007-9111-x

Park, C. L., Edmondson, D., Fenster, J. R., & Blank, T. O. (2008). Positive and negative health behavior changes in cancer survivors: A stress and coping perspective.

Journal of Health Psychology, *13*(8), 1198-1206. doi:10.1177/1359105308095978

Park, C. L., Edmondson, D., Hale-Smith, A., & Blank, T. O. (2009). Religiousness/spirituality and health behaviors in younger adult cancer survivors: Does faith promote a healthier lifestyle?. *Journal of Behavioral Medicine, 32*(6), 582-591. doi:10.1007/s10865-009-9223-6.

Penke, L., Denissen, J. A., & Miller, G. F. (2007). The evolutionary genetics of personality. *European Journal of Personality, 21*(5), 549-587. doi:10.1002/per.629

Piedmont, R. L. (1999). Does spirituality represent the sixth factor of personality? Spiritual transcendence and the five-factor model. *Journal of Personality*, *67*(6), 985-1013. doi:10.1111/1467-6494.00080

Piedmont, R. L., Ciarrochi, J. W., Dy-Liacco, G. S., & Williams, J. E. G. (2009). The empirical and conceptual value of the spiritual transcendence and religious involvement scales for personality research. *Psychology of Religion and Spirituality,* 1-18.

Piedmont, R. L., Werdel, M. B., & Fernando, M. (2009). The utility of the assessment of spirituality and religious sentiments (ASPIRES) scale with Christians and Buddhists in Sri Lanka. *Research in the Social Scientific Study of Religion*, *20*, 131-143.

Porro, G. & Iacus, S. M. (2009). Random recursive partitioning: A matching method for the estimation of the average treatment effect. *Journal of Applied Econometrics, 24,* 163-185.

Powell, L. H., Shahabi, L., & Thoresen, C. E. (2003). Religion and spirituality: Linkages to physical health. *American Psychologist*, *58*(1), 36-52. doi:10.1037/0003-066X.58.1.36

Priester, P. E., Scherer, J., Steinfeldt, J. A., Jana-Masri, A., Jashinsky, T., Jones, J. E., & Vang, C. (2009). The frequency of prayer, meditation and holistic interventions in addictions treatment: A national survey. *Pastoral Psychology*, *58*(3), 315-322. doi:10.1007/s11089-009-0196-8

Purdy, M., & Dupey, P. (2005). Holistic flow model of spiritual wellness. *Counseling and Values*, *49*(2), 95-106. Retrieved from EBSCO*host*.

Quinn, P. D., & Fromme, K. (2010). Self-regulation as a protective factor against risky drinking and sexual behavior. *Psychology of Addictive Behaviors*, *24*(3), 376-385. doi:10.1037/a0018547

Rammstedt, B., & John, O. P. (2007). Measuring personality in one minute or less: A 10-item short version of the big five inventory in English and German. *Journal of Research in Personality*, *41*(1), 203-212. doi:10.1016/j.jrp.2006.02.001

Raynor, D. A., & Levine, H. (2009). Associations between the five-factor model of personality and health behaviors among college students. *Journal of American College Health, 58*(1), 73-81. doi:10.3200/JACH.58.1.73-82

Rippentrop, A., Altmaier, E. M., Chen, J. J., Found, E. M., & Keffala, V. J. (2005). The relationship between religion/spirituality and physical health, mental health, and pain in a chronic pain population. *Pain*, *116*(3), 311-321. doi:10.1016/j.pain.2005.05.008

Robie, C., Komar, S., & Brown, D. J. (2010). The effects of coaching and speeding on big five and impression management scale scores. *Human Performance*, *23*(5), 446-467. doi:10.1080/08959285.2010.515278

Rockhill, B., Willett, W. C., Manson, J. E., Leitzmann, M. F., Stampfer, M. J., Hunter, D. J., & Colditz, G. A. (2001). Physical activity and mortality: A prospective study among women. *American Journal of Public Health*, *91*(4), 578-583. doi:10.2105/AJPH.91.4.578

Rosmarin, D. H., Pargament, K. I., & Flannelly, K. J. (2009). Do spiritual struggles predict poorer physical/mental health among Jews?. *International Journal for the Psychology of Religion*, *19*(4), 244-258. doi:10.1080/10508610903143503

Ross, C. J., & Francis, L. J. (2010). The relationship of intrinsic, extrinsic, and quest religious orientations to Jungian psychological type among churchgoers in England and Wales. *Mental Health, Religion & Culture, 13*(7-8), 805-819. doi:10.1080/13674670802207462

Ryan, T., & Xenos, S. (2011). Who uses Facebook? An investigation into the relationship between the big five, shyness, narcissism, loneliness, and Facebook usage. *Computers in Human Behavior*, *27*(5), 1658-1664. doi:10.1016/j.chb.2011.02.004

Santelli, J. S., Robin, L., Brener, N. D. & Lowry R. (2001). Timing of alcohol and other drug use and sexual risk behaviors among unmarried adolescents and young adults. *Family Planning Perspectives*, *33*(5), 200-205.

Saroglou, V. (2002). Religion and the five factors of personality: A meta-analytic review. *Personality and Individual Differences*, *32*, 15-25.

Saroglou, V., & Muñoz-García, A. (2008). Individual differences in religion and spirituality: An issue of personality traits and/or values. *Journal for the Scientific Study of Religion, 47*(1), 83-101. doi:10.1111/j.1468-5906.2008.00393.x

Schwadel, P. (2005). Individual, congregational, and denominational effects on church members' civic participation. *Journal for the Scientific Study of Religion*, *44*(2), 159-171. doi:10.1111/j.1468-5906.2005.00273.x

Seybold, K. S., & Hill, P. C. (2001). The role of religion and spirituality in mental and physical health. *Current Directions in Psychological Science*, *10*(1), 21-24. doi:10.1111/1467-8721.00106

Soto, C. J., & John, O. P. (2009). Ten facet scales for the big five inventory: Convergence with NEO PI-R facets, self-peer agreement, and discriminant validity. *Journal of Research in Personality, 43*(1), 84-90. doi:10.1016/j.jrp.2008.10.002

St. Petersburg Times (1999). *Ancient Egyptian religion*. Retrieved from http://www2.sptimes.com/Egypt/EgyptCredit.4.3.html

Stefansdottir, I., & Vilhjalmsson, R. (2007). Dimensions of health-related lifestyle in young adulthood: Results from a national population survey. *Scandinavian Journal Of Caring Sciences, 21*(3), 321-328.

Strobl, C., Malley, J., & Tutz, G. (2009). An introduction to recursive partitioning: Rationale, application, and characteristics of classification and regression trees, bagging, and random forests. *Psychological Methods, 14*(4), 323-348. doi:10.1037/a0016973

Tabachnick, B. G., & Fidell, L. S. (2007). *Using multivariate statistics* (5th ed.). Boston, MA: Allyn & Bacon/Pearson Education.

Vollrath, M. E., & Torgersen, S. (2008). Personality types and risky health behaviors in Norwegian students. *Scandinavian Journal of Psychology, 49*(3), 287-292. doi:10.1111/j.1467-9450.2008.00631.x

Walker, S. N., Sechrist, K. R., & Pender, N. J. (1987). The health-promoting lifestyle profile: Development and psychometric characteristics. *Nursing Research, 36*(2), 76-81

Wang, C. W., Chan, C. W., Ng, S. M., & Ho, A. Y. (2008). The impact of spirituality on health-related quality of life among Chinese older adults with vision impairment. *Aging & Mental Health*, *12*(2), 267-275. doi:10.1080/13607860801951903

Westgate, C. E. (1996). Spiritual wellness and depression. *Journal of Counseling & Development*, *75*(1), 26-35. Retrieved from EBSCO*host*.

Young, J., Cashwell, C. S., & Shcherbakova, J. (2000). The moderating relationship of spirituality on negative life events and psychological adjustment. *Counseling and Values*, *45*(1), 49-57.

Zinnbauer, B. J., & Pargament, K. I. (2005). *Religiousness and spirituality*. In R. F. Paloutzian, C. L. Park, R. F. Paloutzian, C. L. Park (Eds.) , Handbook of the psychology of religion and spirituality (pp. 21-42). New York, NY US: Guilford Press. Retrieved from EBSCOhost.