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The Implications of Religion and Internal Motivations on Health Behaviors

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THE IMPLICATIONS OF RELIGION AND INTERNAL MOTIVATIONS ON HEALTH BEHAVIORS

by

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ABSTRACT

It is thought that religion and internal motivations may act as guiding forces behind the thoughts and actions of individuals. The purpose of this thesis is to explore if religiousness and internal motivations may influence individual health behaviors. To explore these relationships, a convenience sample using a 5-minute Qualtrics survey with questions regarding religiousness, internal motivations, and health behaviors was developed. This survey was offered to UCF students over the course of a few semesters. It is hypothesized that individuals that indicate more religiousness and stronger internal motivations (internal locus of control and self-efficacy) will demonstrate more positive health behaviors. Data analysis was conducted using a statistical software package (SPSS) with univariate, bivariate, and regression analysis being performed. Results reveal that internal motivations and religiosity appear to be significantly associated with some of the specific health behaviors tested. Place of worship attendance was found to be significantly associated with a lower number of health behaviors compared to other religiousness-related questions. Of all the internal motivation statements included, feeling helpless when dealing with some problems in their life was significantly associated with the largest number of health behaviors tested. These findings are critical as the links established between religiousness, internal motivation, and health behaviors may serve as a point of emphasis when developing positive health interventions for individuals.

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INTRODUCTION

The purpose of this paper is to offer an overview of the established research regarding the impact and relationship between religiosity and internal motivations, on the health behaviors of individuals. The relationship between socioeconomic status (SES) and health behavior has been extensively studied in research and its significant influence serves as a key factor to consider. Research links increased mortality with low SES in the United States, emphasizing the relevance of socioeconomic disparities when it comes to health (Nandi et al., 2014). Researchers also identify that religiosity and principles governing an individual's internal motivations affect health. Religion may act as a source of hope and guidance for some individuals. It is common to see people turn to religion during difficult circumstances, and religion can have positive impacts on health. One example is how followers of Islam may follow religious rulings in some countries, such as Malaysia, which ban Muslims from smoking because of the potential health risks (Elkalmi et al., 2016). It is important to establish a greater understanding of the everyday role religion has on behavior. These considerations could prove beneficial when attempting to promote individual participation in more positive health behaviors. Individuals are leading more sedentary lives and are increasingly surrounded by poor dietary options. This includes but is not limited to many unhealthy but affordable fast-food options. Having a greater understanding of how internal motivations impact behavior might act as a viable turning point for attempts to improve the health behaviors of individual

Research on religion is a fascinating study because religious participation is largely a personal choice. Researchers have long explored the methods by which religion positively influences the physical health of individuals. A mediation model first developed by Ellison and Levin in 1998 (as cited in Son et al., 2011) was created to explain the impact of religion on health and includes three key categories that work as mediators. First, religiosity or religious beliefs can lead to healthier lifestyle choices. This is related to the discouragement of engaging in unhealthy behaviors, including the excessive use of tobacco and high amounts of alcohol consumption in the name of living a pious lifestyle. The second mediating category explores the tendency for people who are religious to have a decreased likelihood of experiencing adverse psychological states. The researchers suggest that a possible explanation for this is that religious individuals feel an increased sense of love and support from a divine entity. This in turn enhances how the person perceives themselves. The last key mediator is centered on social networks and the social support that religiosity can offer. Many religions encourage group gatherings for prayer and offer various support groups for their followers. For example, in Islam, there is a congregation prayer on Friday afternoons that followers are encouraged to attend. This serves to bring followers of shared faith together. In addition, many Christian denominations, have Sundays as a day when followers attend church services. This gathering brings many individuals together and promotes social interactions amongst followers.

Another study conducted by researchers explores the relationship between religiosity, religious support, and social support for African American women participating in a physical activity intervention program (Harvey et al., 2016). Various instruments were used throughout

the study to measure each critical component. Information from the Learning and Developing Individuals Exercise Skill (LADIES) was used to identify methods to encourage physical activity for African American women. The 466 women included were separated into three clusters. The first cluster received a faith-based (FB) curriculum that used spiritual ideas to increase physical activity. Cluster 2 received a non-faith-based (NFB) curriculum that was focused on the use of behavior change and social theories in attempts to promote physical activity. For the third cluster, written materials were used to try and boost physical activity among participants. Religious support was assessed using a four-point scale for emotional support and negative interaction, as well as anticipated support. Higher scores reflected an increase in the amount of support. To assess religiosity, multiple items were used to measure private religious practices and organizational religiousness. Private religious behaviors refer to informal behaviors that do not occur at places of worship. An example of this is watching a religious program on television. For this assessment, five questions were given to participants with a five-point scale response format. Organizational religiousness refers to involvement in formal religious institutions, such as how often an individual attends religious service. It was measured via a two-question and six-point response format. The results depicted that private religious practices were negatively correlated with religiosity, and organizational religiousness was positively correlated. A significant positive correlation was found when looking at total general social support with total religious support. A potential limitation mentioned was that participants were self-selected and consequently, there may be some shared characteristics between groups. Researchers also noted that the final sample size decreased from 466 participants to a range of 361-458 due to missing data. Overall, researchers concluded that more research is needed to better clarify the

relationship between religiosity and social support in promoting positive health behaviors, such as regular physical activity.

In a study to determine the relationship between religious involvement and health behaviors, researchers evaluated the frequency of five positive health behaviors (Krause et al., 2017). These researchers were interested in exploring whether a sacred view of the body was associated with more healthy behaviors. A focus was made on assessing God-mediated control, which refers to the belief that collaboration with God is needed for individuals to achieve their goals and resolve challenges. Five different behaviors were assessed including increased strenuous exercise, increased moderate exercise, larger consumption of vegetables and fruits, better quality sleep, and the adoption of healthier lifestyles. This study used data from the Landmark Spirituality and Health Survey, which used residents throughout the United States that were at least 18 years of age. The study had a response rate of 50%, and a total of 3,010 interviews were done. Participants were asked questions regarding each of the five health behaviors, if they have a sacred body view, and about God-mediated control. Additional measures for religious and demographic controls were also used. The results are suggestive of a complex relationship between religious involvement and the number of positive health behaviors an individual participates in. A strong sense of God-mediated control is a key caveat when looking at whether strong sacred body views are associated with positive health behaviors. In fact, people who did have sacred body views were less likely to participate in the discussed health behaviors if they had little God-mediated control. This finding is reflective of the notion that people can view their bodies as sacred but still lack the means to actually and effectively adopt healthy behaviors. Multiple limitations were mentioned, including that the data was self-

reported, the study was cross-sectional, and most measures for healthy behaviors only consisted of one item. With high rates of obesity and chronic illnesses in the United States, it is important to consider avenues that encourage individuals to engage in healthy behaviors. This study suggested that religion-related intervention groups should not only try to have participants be more aware that their bodies are sacred but also promote the willingness of God to help them as they attempt to adopt healthier behaviors.

Many various health behaviors have been studied by researchers and identified as important considerations when assessing an individual's health. One critical factor to consider is sleep. One study was conducted to explore further the potential link between religiousness and sleep (Hill et al., 2018). Their findings and analysis suggest that religious engagement could serve as a social determinant of sleep for individuals in the United States. Adults who were identified as more religious displayed better sleep quality compared to their less religious counterparts. Researchers suggest that religious involvement might be connected to better sleep by reducing chemical, mental, and physiological arousal from exposure to variables including stress and substance use (Hill et al., 2018). A conceptual model developed by the researchers of this study depicted the potential positive connections between religious involvement and healthier sleep, and potential negative connections between religious involvement and psychological distress and psychological distress and healthier sleep.

Religiosity also has been studied for its potential influence on an individual's self-control, which in turn can influence the health of individuals. A study was conducted to explore the influences of affective and cognitive religiosity on consumer reactance and self-control (Minton, 2018). Religiosity is described as "the degree to which one holds religious beliefs and

values both through an internal spiritual connection and external religious practices and behaviors" (Minton & Kahle, 2014, p. 12–13). Researchers in the study focused on the affective and cognitive dimensions of religiosity. Affective religiosity refers to the spiritual connection an individual has to a god or other divine being. Cognitive religiosity refers to the particular beliefs an individual has about God. Multiple studies were conducted and described in the paper. The first study was about health goals regarding religious message prime and self-control. Participants were asked questions about healthy eating, religiosity, and demographics. The participant's commitment to healthy eating and how important they believed it to be was assessed and used to study the effectiveness of the religious prime (Minton, 2018). Results of the first study reveal that a consumer's commitment to healthy eating varies when looking at affective and cognitive religiosity.

The second study from this paper assessed the relationship between religious writing prime and food indulgence. Participants were exposed to a bowl of cookies and asked questions about cookie indulgence and religiosity. The results from the second study revealed that consumers with higher cognitive religiosity and lower affective religiosity demonstrated less self-control after being exposed to a religious prime (Minton, 2018).
These findings from the second study were consistent with the results from the first and offer support for the use of religious primers to try and improve self-controlled eating behaviors in individuals.

There have been efforts to develop an empirical basis for typologies of religiousness and spirituality (R/S). One such research study developed typologies based on service attendance, prayer, daily spiritual experiences, and positive coping through religion (Park et al., 2011). This

paper used measures from the Brief Multidimensional Measure of R/S and 1,431 individuals participated. A person-centered approach was used and iterated the significance of using multiple domains during attempts to assess the relationship between religiousness and health. Consequently, the researchers chose to use a four-class model with various levels of religiosity ranging from non-religious to highly religious. Each of the four classes was associated with various degrees of well-being. The findings demonstrated that people who were in the highly religious class achieved the highest scores in all measures of well-being. However, it was found that people that were minimally religious had fewer depressive symptoms when compared to the participants in the somewhat religious group. This study was significant because it resulted in the formation of a tool that can be used to formulate health interventions that are more specific and better suited for every individual.

Religion is often associated with increased hopefulness and can give people a greater sense of purpose in their everyday lives. Individuals turn to religion in times of stress and may use it as a means of coping. Religious coping is defined as the use of religious resources including prayer and faith in God as a coping mechanism (Fadardi et al., 2017). Trust in God can help people to remain positive and persevere when facing challenging moments in their lives. Therefore, the researchers of this study found it is reasonable to associate a relationship with God with improved mental well-being, although there are likely other mediating factors that assist in this association (Fadardi et al., 2017).

Researchers have also explored the role of religion in mindfulness-based interventions. In a study by Palitsky and Kaplan, how religion can impact the acceptability of mindfulness-based exercises, as well as suggestions for how researchers and other interventionists should approach

religious concerns regarding these exercises were studied. The researchers made an important note of how some of the same mindfulness-based interventions (MBIs) are promoted as being spiritual or religious, vs. secular in large part based on who the intended audience is. Additionally, they recognize techniques including yoga and compassion meditation as not typically referred to as mindfulness but resemble practices in MBIs. It is noted that MBIs used in the United States and Europe are largely based on Asian traditions. Consequently, it is possible that MBIs represent a form of cultural mixing which can give rise to different reactions based on the individual. For example, if an individual with strong religious convictions perceives the MBIs as intruding on the revered components of their culture they may be less receptive to them. In contrast, some individuals may welcome MBIs because they perceive them as a creative form of cultural mixing (Palitsky & Kaplan, 2021). The findings of this study were significant because they reveal the significance of perspective when it comes to people's willingness to engage in MBIs.

How religiosity can affect an individual's health or health behaviors have been explored for people at various ages and stages of life. An example of a study on the effects of religiosity on negative health behaviors was published in 2021 and written by Rios and Freire. The purpose of this study was to explore the relationship between adolescents, aged 13-19 in Midwestern Brazil, religiosity and motivation to begin and cease smoking. A questionnaire was provided with questions from the Duke Religion Index to measure religiosity and from the Prime Theory of Motivation to assess motivation. The Duke Religion Index is a 5-item scale that measures three components of religiosity and quantifies it as a trait (Koenig & Büssing, 2010). A couple of the questions included are "How often do you attend church or other religious meetings?" and

"My religious beliefs are what really lie behind my whole approach to life." The Prime Theory of Motivation indicated that external cues and mental processes are part of the motivational system that drives changes in smoking habits. Results of the study revealed that religiosity has a protective effect in the mechanisms of motivation that can affect smoking behavior in adolescents. Participants who were classified as more religious felt less motivated to begin smoking and were also more motivated to quit had they started. Researchers also noted that most adolescent smokers were not motivated to cease smoking or believed that they should but still did not intend to quit. These observations underscore the possibility of religiosity as a protective factor for smoking prevention and emphasize the importance of additional interventions to boost motivation to quit in adolescents who smoke.

Different types of religious motivations may result in differing health behaviors and have different effects on an individual's health. In a 2011 study by Masters and Knestel, these researchers sought to explore how cardiovascular reactivity, such as blood pressure and heart rate, relate to stress in middle-aged individuals that have been grouped by their religious motivation. The participants were grouped by their religious motivation, which was classified as being Intrinsic, Pro-religious, or Non-religious. Intrinsic religiousness was defined by previous researchers as "motivation for experiencing and living one's religious faith for the sake of the faith itself." Extrinsic religiousness describes individuals whose primary motivation for religious engagement stems primarily from factors other than the religion itself. This can be seen when individuals' religious engagement is tied more to the feelings of security and the social relationships that come with their involvement (Masters & Knestel, 2011). Pro-religious participants were categorized as individuals that have high amounts of intrinsic and extrinsic

religiousness. Non-religious individuals were classified as being low on the intrinsic and extrinsic religiousness scales. The findings of the study revealed interesting results with the Pro-religious individuals having decreased cardiovascular reactivity compared to the other groups but worse psychological profiles when compared to the Intrinsic group. These results indicate that religiousness has the potential to improve the physical well-being of individuals but can also weaken their psychological well-being. These findings demonstrate the complex relationship between religiousness and the overall health of individuals.

Some past studies have revealed the potential negative health effects associated with religion. In a study by Horton, some of these negative health effects are further described. The harmful consequences that come from exercising one's religious beliefs were defined as the negative health effects of religion (Horton, 2015). An example of a potentially negative health effect tied to religious beliefs can be seen when certain religious beliefs prohibit people from getting immunizations or other preventative treatments. A relatively recent example can be seen regarding the COVID vaccine religious exemptions. Jehovah's witnesses also offer religious explanations for not wanting any blood transfusions performed on them. The study by Horton also offered information on how both physical and psychological health problems can be related to religion. Instances may arise where individuals may negate their health and use their time to participate in activities that are deemed more religiously significant. It is also possible that religious attitudes surrounding sexual activity outside of marriage may leave individuals more hesitant to reach out for answers to their sexual health questions and less likely to learn about healthy practices related to sexual activity (Horton, 2015). Religious services may require attendees to sit for a long period of time which can limit their mobility, and may consequently

affect their health. The time spent participating in religious services may also lower the time available for engaging in other healthy activities, such as exercise.

Previous literature has revealed that religion has the potential to have positive and negative implications when examining consequent behavior and health. It is largely apparent that religion is an essential aspect to consider when attempting to make connections regarding what motivates human health behaviors.

ROLE OF INTERNAL MOTIVATIONS

Internal motivations can act as important motivators for individual behaviors. Some key concepts associated with internal motivation include self-efficacy and locus of control. Locus of control is often classified as internal or external. It refers to how an individual perceives rewards as a consequence of their own actions or as a consequence of some outside force (Ryan & Francis, 2012). An internal locus of control places an emphasis on personal effort acting as the central force behind success. An external locus of control focuses on forces like fate and luck when considering reasons for success. In Australia, 122 Christians were participants in a study to assess the role of locus of control as a mediator for religious functioning and psychological health (Ryan & Francis, 2012). Multiple questionnaires were administered to assess health, locus of control, and religious functioning. More specifically, the Belief in Personal Control Scale was used to determine the locus of control. Furthermore, this scale can discriminate between internal, external, and God locus of control systems. The results revealed that an external locus of control and instability correlated to worse health. Having an internal locus of control was associated with better health. It also was found to serve as a mediator for awareness of God and improved mental health. This research suggests a possible technique for therapists to investigate the influence of belief systems on mental health. It emphasizes how important internal motives may be for an individual's health. It reflects the belief that people's attitudes and behavior might be influenced by their mindsets.

How a divine locus of sleep control impacts the sleep quality of college students was studied by researchers (DeAngelis et al., 2019). A divine locus is similar in definition to a God locus and in this aforementioned study, it refers to how much an individual believes God

influences or collaborates with them regarding their sleep. The intention of this paper was to investigate two main ideas. The first was how opinions of personal and divine control over an individual's sleep schedule interact in different ways to predict the quality of sleep for college students. The second was to see if health behaviors and psychological stress act as mediators for the relationship between viewpoints of sleep control and sleep quality. 1,251 students surveyed from a South Texas university self-reported their answers. Mediation analyses were also used to account for the effects that smoking, drinking, and psychological distress may have on perceptions of sleep control on sleep quality. Findings revealed that individuals who had reported high personal and high divine control were 148% more likely to report high-quality sleep (DeAngelis et al., 2019). Researchers of the study found that college students who believed that God and themselves shared total control of their sleep schedules reported the greatest sleep quality among participants. The researchers also indicate these findings might be reflective of these college students having reduced average levels of psychological distress.

Another study focused on exploring the connection between diet, exercise, and locus of control in the formation of healthy habits. The purpose of this paper was to study the association between individuals' locus of control and their choice to exercise consistently, eat healthily, minimize drinking, and avoid the use of tobacco (Cobb-Clark et al., 2013). The concept of locus of control (LOC) is reflective of how much an individual believes that outcomes in their life are due to their own behavior. It was found that people who have an internal locus of control were more likely to exercise consistently, eat more healthily, and smoke less. These relationships became apparent even after accounting for how much each individual valued their health. The results also revealed important differences in internal locus of control in men and women.

Women with internal LOC were found to participate in healthy habits largely because of the sense of satisfaction that came with their actions. In contrast, men with an internal LOC sought higher health returns for their commitment to exercise and diet (Cobb-Clark et al., 2013). The findings that an internal LOC coincides with living a healthier lifestyle support the idea that internal control inclinations help people make more deliberate and less affective decision-making.

In a study from 2018, researchers sought to explore the relationship among religious beliefs and behavior, spiritual health locus of control (SHLOC), and chosen health behaviors and consequences (Clark et al., 2018). Over 750 African American adults nationwide were interviewed via telephone three times over a five-year period. The study is largely influenced by Rotter's 1954 social learning theory, which states that how an individual behaves is related to the outcome they expect to occur and the value they place on that outcome. From this theory, the locus of control (LOC) construct was later developed. The SHLOC scale is an example of a specific type of LOC created that relates to spiritual health. It is used to determine how a person views God's role in some health-associated behaviors and outcomes (Clark et al., 2018). The influence of God on behavior in spiritual health locus is synonymous to God and divine locus of control that was mentioned in the earlier studies discussed. The researchers list both passive and active factors to consider when it comes to SHLOC. Active factors are related to the belief that the person themself is responsible for their health and should work with God to reach desired goals. Passive factors are defined in the study as the belief that God is what determines an individual's health, rendering it unnecessary for the person to partake in behaviors that promote health. Findings revealed that having stronger religious beliefs and behaviors was associated

with bigger changes in active SHLOC. Researchers also found that over time religious behaviors were associated with more passive SHLOC regarding particular health outcomes. Furthermore, over time passive SHLOC was found to be related to health outcomes that were less advantageous for individuals.

Changeability beliefs have also been found to play a key role in mediating health behaviors and physical health. Related to changeability beliefs are implicit theories, which can be considered unique from self-efficacy and behavioral control because it has a greater focus on the malleability of a certain outcome (Parent & Alquist, 2016). Parent and Alquist studied changeability beliefs specifically related to weight. These researchers questioned 8,000 individuals using items from the National Health and Nutrition Examination Survey (NHANES), followed by taking health measurements at testing centers. The questions asked related to beliefs about weight, eating habits, and amounts of physical activity. Believing that weight was unchangeable was negatively associated with the amount of exercise and positive eating habits of participants. The belief that weight was unchangeable had a positive correlation to negative eating habits. This study revealed the importance of promoting the idea that weight is changeable. It also suggests the use of motivators other than weight can serve as effective strategies to improve the health behaviors of individuals. This is a logical next step when considering that people may be more responsive to lifestyle and activity changes if they believe their goals are attainable.

The term self-efficacy was first created by famous psychologist Albert Bandura in his study in 1977 (Bandura, 1977). Bandura went on to define self-efficacy as the belief an individual has in their ability to perform a task and achieve the desired outcome. In this article,

the social cognitive theory was also referred to when drawing associations between self-efficacy and social support. A more recent study seeks to better comprehend how self-efficacy and peer support can influence high-intensity physical activity in adolescents (Hamilton et al., 2017). For this study, 226 students between the ages of 12-16 were asked to answer a survey at two distinct times. Included in the survey were a multitude of questions to assess the self-efficacy, friend support, intentions, and behaviors of the participants. Computations were conducted using SPSS 23 and SPSS PROCESS. The results revealed that self-efficacy acted as the best predictor of intentions, even topping friend support. The intention of the individual also acted as a key mediator for both self-efficacy and physical activity. The findings revealed that adolescents with poor self-efficacy should concentrate on increasing their intention to engage in intense physical activity, possibly through social support. This research emphasizes the significance of self-efficacy in adolescents. It can assist individuals in overcoming low social support and other obstacles that inhibit healthy behavior. Given the significance of self-efficacy, it is critical to analyze how events may alter an individual's self-efficacy.

The factors that may influence the self-efficacy of individuals have been extensively studied by researchers. One such research paper consisted of two longitudinal studies to examine potential associations between positive experiences and exercise (Parschau et al., 2014). In both samples studied, positive experiences were found to predict motivated self-efficacy and behavioral intentions. These findings were aided by the use of structural equation modeling. Furthermore, differences in the difficulty of the exercise were not directly associated with positive experiences for the participants. On an interesting note, action planning was found to boost self-efficacy and encourage exercise in the long run. Experiences might be important

determinants of health behavior. Some people may perceive physical discomfort and perspiration as negative consequences of exercise. As a result, individuals may be less likely to engage in some favorable health habits, such as physical activity.

Researchers have investigated the effect of self-efficacy on a wide range of both good and negative health behaviors. An example of this was a study conducted to determine if there was an association between adolescent smoking and self-efficacy (Veselska et al., 2011). This paper included 501 pupils from elementary schools in Slovakia and the Czech Republic. Participants completed the Self-Efficacy Scale and the Positive and Negative Affect Schedule as well as questions on smoking habit. The Self-Efficacy Scale assessed both general and social self-efficacy. When negative and positive affectivity were considered, only social self-efficacy was connected to an increase in the likelihood of smoking behavior. This might be attributed to greater social demands from peers. The researchers also propose that teenagers be taught good coping techniques when confronted with unpleasant emotions in order to reduce the risk of them resorting to smoking.

In a study from 2016, researchers looked to see if there was an association between religiosity, generalized self-efficacy, mental health, and happiness among college students. Researchers in this study sought to explore the relationship between religiosity and subjective well-being in Arab college students, which they noticed was an area that had not been explored substantially (Abdel-Khalek & Lester, 2017). Underscoring the study is Bandura's social cognition theory that coins self-efficacy as "beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments." How religiosity, generalized self-efficacy, mental health, and happiness relate to one another was studied using a sample of 702

Muslim Arab college students. Previous research has found self-efficacy to serve as an important predictor of an individual's behavior. Mental health is regarded as an essential aspect of someone's well-being, ability to form both familial and interpersonal relationships, and act as a contributing force to society (Satcher, 2000). Happiness is regarded as how much an individual enjoys the life they live or how positively they evaluate their life as a whole. Four different scales were used in the study. Two were self-rating scales aimed at religiosity and happiness respectively. The Arabic Sale of Self-Efficacy and the Arabic Scale of Mental Health were also used. Findings revealed that male students that participated had significantly higher averages on both self-efficacy and mental health compared to the female students (Abdel-Khalek & Lester, 2017). It was also found that participants who consider themselves religious appear to be more self-efficacious and report more positive mental health and happiness levels. The strongest association identified was between self-efficacy and mental health. This was the case for both men and women. Researchers of the study suggest an emphasis on efforts that increase self-efficacy could act as a beneficial strategy to improve mental health.

The relationship between coping self-efficacy, stress, and sleep has also been explored in adults and adolescents. Sleep-stress spirals, where an increase in stress results in less sleep quality which further exacerbates stress has been studied in adults by previous researchers. One study sought to determine if the same spiral exists in adolescents and if so can coping self-efficacy break this spiral (Brink et al., 2020). Coping self-efficacy refers to the belief that an individual has in their ability to cope with stress. Previous research on the matter has revealed that individuals who believe they can manage their stress find the stress less taxing compared to individuals that believe they are incapable of managing their stress. In general, there are two

approaches to disrupting the stress-sleep spiral. One is to target the adolescents' sleep schedule, which is difficult to alter due to how structured their lives are. The other is to target the perceptions of stress which are subjective. Researchers studied 381 9th-grade students between the ages of 14 to 16 who answered surveys every day for two weeks (Brink et al., 2020). Results revealed a unidirectional connection in individuals that were between sleep quality and stress via coping self-efficacy. The researchers of the study believe these results advocate for using coping self-efficacy as a possible intervention target for adolescents. The findings suggest that having confidence in their ability to cope with problems may serve as a significant mechanism for adolescents to prevent the harmful effects of inadequate sleep on stress and its implications on their mental well-being.

Researchers have also conducted research to examine the elements that impact people's engagement in health promotion initiatives. One such study distributed a voluntary survey to employees working at multiple furniture manufacturers (Hall et al., 2014). A health climate questionnaire that incorporated components of health behavior theory was used to collect 349 responses. This test assesses overall attitudes, beliefs, and desire to change a health habit. These researchers revealed two major elements that influenced involvement. The first category was health norms, which are general attitudes toward healthy lifestyles. The second factor was an individual's conviction in their capacity to begin and complete the program. This study was notable because it emphasized the significance of motivation as a factor in persons engaging in health-promoting behaviors.

When attempting to comprehend the internal motives of persons, it is critical to remember that the individuals themselves must have sufficient self-awareness to recognize their

state of mind. There are obstacles to self-knowledge that might keep people from obtaining this state of awareness. According to one study, the most significant hurdles to self-knowledge are informational and motivational barriers (Carlson, 2013). Self-knowledge is defined in this article as the correctness of one's impressions about one's own conduct or personality, while mindfulness is defined as being aware of what one is now experiencing. Trying to deduce where someone's innermost motives reside might be difficult. It may take time and require thorough introspection or contemplation from the individual.

SIGNIFICANCE

As individuals become more sedentary, it is critical to discover strategies to encourage healthy practices. People are spending increasingly more time on electronic gadgets and less time engaged in physical activities, such as exercise. Obesity and chronic diseases remain important sources of concern, particularly in the United States. Establishing links between religiousness, motivation, and positive health behaviors might be a critical focus when developing positive health interventions. Socioeconomic status has been identified as a key factor in health behavior. It can be difficult to encourage healthy behaviors, and research shows that campaigns should be diverse (Trapp et al., 2015). Individual, societal, and environmental correlates are all potentially significant factors to consider. An individual's health behaviors impact their daily well-being and can have long-term negative implications. It is critical to perform further studies on the mediators of beneficial health habits. Additional research will result in more effective and efficient methods for improving health behaviors.

DATA AND MEASURES

Participants and Data

The data that will be used for this research project will be from a convenience sample of adult UCF undergraduates enrolled in at least one sociology course during the Fall 2021, Spring 2022, Fall 2022, and Spring 2023 semesters. Study participants were given a URL to an anonymous 5-minute survey containing 20 questions about religiosity, internal motivations, and health behaviors as well as background information on their age, race, gender, and socioeconomic status (See Appendix A). The Qualtrics survey platform was used to distribute surveys. In addition, two members of the Sociology Department faculty provided the survey link to their students. The initial survey results garnered responses from 605 participants, but after conducting screening procedures and necessary filters, 291 participants completely answered all questions of interest.

Measures

Dependent Variable

Health behaviors, the dependent variable in this study, were operationalized using 10 questions measuring various components of this variable. Respondents were asked one question using a scale of 1-10, reflecting far below average to far above average, about how they would describe their general health and one question about possible activity limitations. Respondents were asked two questions about the number of days per week (0-7) they experienced certain sensations, such as feeling well-rested after sleep or breaking a sweat when exercising. Respondents were also asked to rank on a scale from 1-10 (from terrible to excellent) their

healthy eating habits and to describe their weight (from very underweight to very overweight). Respondents were asked three questions about how likely (extremely unlikely to extremely likely) they were to engage in certain behaviors including drinking alcohol, eating junk food, and participating in mindfulness exercises when stressed. Participants were also asked how many days in the past 14 did they use a nicotine-related product (including cigarettes, vapes, hookah, etc.). Due to the significant drop in the number of responses associated with this question, and other questions in the survey being reflective of negative health behaviors, it was excluded from consideration during data analysis.

These questions were chosen to be included in the survey because they capture the frequency and intensity of a wide array of health-affecting behaviors.

Independent Variables

The independent variables used for this study were religiosity and internal motivations. Religiosity was assessed using three different questions. Respondents were given two questions that asked them to rank on a scale of 1-10, with 1 being the least and 10 the most, how religious they consider themselves and how often they turn to religion for assistance to cope with problems in their life. The third question was used to assess how often the respondent attended their place of worship, with options ranging from never to more than once a week. Internal motivations were measured using five statements that asked respondents to indicate their agreeability on a scale of 1-10, with 1 being the least and 10 the most agreeable. These five statements were chosen to assess the locus of control and self-efficacy of participants.

These questions were included because they capture the intensity of religiosity and the mindset surrounding the internal motivations of the respondents.

Demographic Variables

Participants were asked various questions related to demographics. Participants were first asked to type in their Age. They were also asked to select their Race, Ethnicity, and Gender from a variety of multiple-choice options provided. Socioeconomic status was also controlled for using the MacArthur Scale of Subjective Social Status. For the MacArthur Scale, respondents were asked to indicate what rung (1-10) on a hypothetical ladder they would place themselves on to indicate their relative position in society. The lower rungs reflect individuals that are the worst off in terms of money, education, and jobs while the top rungs represent those that are the best off in society regarding the same terms.

HYPOTHESES

It is hypothesized that religiousness and internal motivations will indeed affect the health behaviors of individuals.

Specifically:

Those who indicate greater religiosity will demonstrate more positive health behaviors and less negative health behaviors.

Those with higher internal motivations (stronger self-efficacy and internal locus of control) will demonstrate more positive health behaviors and less negative health behaviors.

ANALYTIC STRATEGY

To assess the suggested hypotheses the data collected from the survey will be downloaded to a statistical software package (SPSS). This will allow for data analysis to be conducted to see if there are patterns that support the predictions listed in the Hypotheses section above. To analyze the survey data univariate analysis, bivariate analysis, and multivariate regression tests were conducted using SPSS. For the univariate analysis, frequencies and descriptives were run for the independent variables. This includes religion-related questions and internal motivation statements of interest. For the bivariate analysis, Spearman rho and Pearson correlations were used to identify associations between the independent variables and dependent variables of interest. The dependent variable of interest refers to the health behaviors discussed and included in the analysis. Lastly, regressions tests were conducted to examine the relationship between the independent variables discussed and each individual health behavior. One regression test was run for each of the health behaviors included.

RESULTS

Univariate Analysis

Religion

Descriptive statistics were conducted for frequency of place of worship attendance, extent an individual considers themselves religious, and how often they turn to religion to help cope with problems in their life. The largest proportion of respondents indicate they either never attend their place of worship at 28.5% or only attended once or twice a year at 26.5% (Table 1). Similar results were found when comparing the descriptive statistics for the extent an individual considers themselves religious, and how often they turn to religion to help cope with problems in their life, with means of 4.98 (SD = 2.56) and 4.68 (SD = 2.89) respectively (Table 2).

Table 1. Frequencies for place of worship attendance (includes religious services or ceremonies).

Response	n	%
Never	83	28.5
Once or twice a year	77	26.5
Several times a year	54	18.6
Once a month	18	6.2
Several times a month	24	8.2
Once a week or more	35	12.0
Total	291	100.0%

Table 2. Descriptive statistics for religiousness-based questions.

	Min	Max	Mean	SD
R1	1.00	10.00	4.98	2.56
R2	1.00	10.00	4.68	2.89

Note. N= 291, scale of 1-10 used with 1 being the least and 10 being the most; R1: extent consider oneself religious, R2: how often turn to religion to cope

Internal Motivations

The descriptive statistics for agreeability with internal motivation statements using a scale of 1-10 were more varied when looking at the resulting means (Table 3). Agreeing that success in life is guided by personal decisions and efforts had a mean of 7.89 (SD= 1.63). Agreeing that successes in life are guided by fate, luck, or other external circumstances corresponded with a mean of 4.93 (SD= 2.22). Agreeing that you feel helpless in dealing with some problems in life had a mean of 5.22 (SD= 2.95). Agreeing that you can do almost anything you set your mind to had a mean of 7.52 (SD= 1.96). The last statement agreeing that an individual is responsible for their actions was found to have a mean of 8.90 (SD= 1.56). Additional descriptive statistics for these statements can also be found in Table 3.

Table 3. Descriptive statistics for agreeability with internal motivation statements.

Statements	Min	Max	Mean	SD
IM1: My successes in life are guided by my personal decisions and efforts.	2.00	10.00	7.89	1.63
IM2: My successes in life are guided by fate, luck, or other external circumstances	1.00	10.00	4.93	2.22
IM3: I feel helpless in dealing with some problems in my life.	1.00	10.00	5.22	2.55
IM4: I can do almost anything I set my mind to.	3.00	10.00	7.52	1.96
IM5: I am responsible for my actions.	2.00	10.00	8.90	1.56

Note. N= 291, scale of 1-10 used with 1 being the least and 10 being the most

Health Behaviors

Frequencies and descriptives were conducted for the eight health behaviors chosen from the survey to be included in data analysis. In regard to general health a mean of 6.81 (SD= 1.71) was found indicating that most respondents believed their health was at least somewhat above average. The average number of days per week respondents indicated they exercised enough to

work up a sweat or woke up well rested (Sleep Quality) was around 3 days for both (Table 4).

Table 4. Descriptive statistics for selected health behavior questions.

	Min	Max	Mean	SD
General Health	2.00	10.00	6.81	1.71
Exercise	0.00	7.00	3.04	1.84
Sleep Quality	0.00	7.00	3.09	1.68
Healthy Eating	1.00	10.00	5.66	1.77

Note. N= 291, General Health and Healthy Eating: scale of 1-10 used with 1 being the lowest and 10 being the highest, Exercise and Sleep Quality: number of times in the past week (0-7 days)

When asked to describe their body weight the largest percentage of individuals (59.5%) self-reported being about average weight, followed by 23.7% of individuals reported being slightly overweight (Table 5).

Table 5. Frequencies for self-assessed body weight.

Response	n	%
Very underweight	5	1.7
Slightly underweight	24	8.2
About average weight	173	59.5
Slightly overweight	69	23.7
Very overweight	20	6.9
Total	291	100.0%

To explore responses for health behaviors when coping with stress, frequency tests were conducted for alcohol use (Table 6), participation in mindfulness-based exercises (Table 7), and consumption of junk food (Table 8).

Table 6. Frequencies for using alcohol as a method of coping with stress.

Response	n	%
Extremely unlikely	52	17.9
Somewhat unlikely	67	23.0
Neither likely nor unlikely	78	26.8
Somewhat likely	94	32.3
Extremely likely	0	0.0
Total	291	100.0%

Table 7. Frequencies for participating in mindfulness-based exercises (including yoga and meditation) as a method of coping with stress.

Response	n	%
Extremely unlikely	154	52.9
Somewhat unlikely	58	19.9
Neither likely nor unlikely	36	12.4
Somewhat likely	35	12.0
Extremely likely	8	2.7
Total	291	100.0%

Table 8. Frequencies for turning to junk food as a method of coping with stress.

Response	n	%
Extremely unlikely	50	17.2
Somewhat unlikely	47	16.2
Neither likely nor unlikely	46	15.8
Somewhat likely	108	37.1
Extremely likely	40	13.7
Total	291	100.0%

Bivariate Analysis

To conduct bivariate analysis both Spearman rho (Table 9) and Pearson (Table 10) correlations were conducted, with variables revealing significant p-values being depicted below.

Table 9. Statistically significant Spearman rho correlations for selected variables.

Variables	Spearman rho	Sig (2-tailed)
IM3 x Body Weight	0.129	0.028
IM3 x Eating Junk Food	0.170	0.004
IM3 x Mindfulness Based Exercises	-0.125	0.034
Religious Attendance x Alcohol Use	-0.116	0.048

Note. N= 291, p-value < 0.05 considered significant

Table 10. Statistically significant Pearson correlations of selected variables.

Variables	Pearson	Sig (2-tailed)
R1 x Exercise	0.141	0.016
R1 x Healthy Eating	0.157	0.007
R1 x General Health	0.151	0.010
R2 x Exercise	0.174	0.003
R2 x Sleep Quality	0.122	0.037
R2 x Healthy Eating	0.154	0.009
R2 x General Health	0.182	0.002
IM1 x General Health	0.164	0.005
IM3 x Exercise	-0.146	0.013
IM3 x Sleep Quality	-0.200	<0.001
IM3 x Healthy Eating	-0.194	<0.001
IM3 x General Health	-0.193	<0.001
IM4 x Sleep Quality	0.125	0.033
IM4 x Healthy Eating	0.203	<0.001
IM4 x General Health	0.254	0.016
IM5 x General Health	0.149	0.007

Note. N= 291, p-value < 0.05 significant

Regression Analysis

Regression tests were conducted to explore the influences of the independent variables on one another in relation to the health behaviors tested. This analysis revealed that after controlling for additional independent variables, associations with body weight and alcohol use to cope were not significant. Additionally, the IM2 statement related to an external locus of control did not have any significant correlations. Consequently, it was not included as a predictor during regression analysis. Significant findings were found for the remaining 6 health-related questions. This includes general health (Table 11), exercise (Table 12), waking up well rested (Table 13), healthy eating (Table 14), junk food consumption to help cope (Table 15), and participation in mindfulness-based exercises to help cope (Table 16).

Table 11. Regression model for general health of respondents.

Predictor	Standardized B	t-score	F
Constant[a]		6.932	5.334*
IM1+	0.059	0.911	
IM3+*	-0.149	-2.540	
IM4+	0.125	1.846	
IM5+	0.073	1.162	
R1+	0.084	0.752	
R2+	0.164	0.117	
Religious Attendance+	-0.144	0.081	

Note. N= 291, [a]Dependent variable: General Health, +Independent Variables, *= significant p-value < 0.05, R^2= 0.117

Table 12. Regression model for average days per week respondent exercised long enough to work up a sweat.

Predictor	Standardized B	t-score	F
Constant[a]		4.491	2.170**
IM1+	0.059	0.911	
IM3+*	-0.149	-2.540	
IM4+	0.125	1.846	
IM5+	0.073	1.162	
R1+	0.084	0.752	
R2+	0.164	0.117	
Religious Attendance+	-0.144	0.081	

Note. N= 290, [a]Dependent variable: Exercise, +Independent Variables, *= significant at $p < 0.05$, **= significant at $p< 0.01$, $R^2= 0.063$

Table 13. Regression model for how many days per week respondent woke up feeling well rested.

Predictor	Standardized B	t-score	F
Constant[a]		5.896	4.054**
IM1+*	-0.150	-2.275	
IM3+**	-0.195	-3.269	
IM4+	0.119	1.724	
IM5+	-0.019	-0.291	
R1+	0.124	1.086	
R2+*	0.098	0.925	
Religious Attendance+	-0.182	-2.188	

Note. N= 290, [a]Dependent variable: Sleep Quality, +Independent Variables, *= significant at $p < 0.05$, **= significant at $p< 0.01$, $R^2= 0.091$

Table 14. Regression model for overall habits of eating healthy foods.

Predictor	Standardized B	t-score	F
Constant[a]		7.068	3.962**
IM1+	0.045	0.677	
IM3+*	-0.147	-2.463	
IM4+*	0.156	2.259	
IM5+	-0.097	-1.523	
R1+	0.125	1.100	
R2+	0.061	0.575	
Religious Attendance+	-0.081	-0.973	

Note. N= 290, [a]Dependent variable: Eating Healthy Foods, +Independent Variables, *= significant at $p < 0.05$, **= significant at $p< 0.01$, $R^2= 0.089$

Table 15. Regression model for likelihood of using junk food as method of coping with stress.

Predictor	Standardized B	t-score	F
Constant[a]		-0.458	2.317*
IM1+	0.068	1.004	
IM3+**	0.166	2.736	
IM4+	0.009	0.130	
IM5+	0.122	1.872	
R1+	-0.022	-0.188	
R2+	-0.084	-0.778	
Religious Attendance+	0.068	0.807	

Note. N= 290, [a]Dependent variable: Junk Food Consumption, +Independent Variables *= significant at $p < 0.05$, **= significant at $p< 0.01$, $R^2= 0.054$

Table 16. Regression model for likelihood of using mindfulness-based exercises (includes yoga and meditation) as a method of coping with stress.

Predictor	Standardized B	t-score	F
Constant[a]		23.899	2.355*
IM1+	-0.009	-0.132	
IM3+	-0.093	-1.526	
IM4+	0.109	1.548	
IM5+*	-0.149	-2.282	
R1+	0.029	0.254	
R2+	-0.181	-1.678	
Religious Attendance+*	0.178	2.097	

Note. N= 290, [a]Dependent variable: Mindfulness-Based Exercises, +Independent Variables, *= significant at $p < 0.05$, $R^2 = 0.055$

DISCUSSION

The hypothesis that individuals who indicate greater religiousness will demonstrate more positive health behaviors and less negative health behaviors was supported. Additionally, the hypothesis that individuals who indicate higher internal motivations (greater self-efficacy and internal locus of control) will demonstrate more positive health behaviors and less negative health behaviors was also supported.

An interesting finding regarding the religion-related questions was that despite the majority of respondents indicating they attend their place of worship a couple of times a year or less, the mean for how religious an individual considers themselves was close to 5, indicating an average amount. This could be reflective of individuals not placing as high of a value on or associating place of worship attendance with how religious they are.

Positive Pearson correlations were associated with the extent an individual considers themselves religious, their general health, how often they exercise, and with healthy eating habits. This is reflective of individuals that indicate they are more religious participating in these healthy behaviors more often. Positive Pearson correlations were also associated with how often individuals turn to religion to help them cope and general health, exercise, healthy eating, and sleep quality. This is suggestive of individuals that turn to religion as a coping mechanism on a more frequent basis also participate in these healthy behaviors more often.

Of all the internal motivation statements IM3, which was related to feeling helpless in dealing with some problems in life, was associated with the largest number of health behaviors discussed at 7. This statement was chosen to reflect lower self-efficacy and a weaker internal locus of control. Based on the positive Spearman rho and Pearson correlations, individuals that

indicated feeling more helpless had increased body weight and junk food consumption, while negative values indicated being less likely to participate in mindfulness-based exercises and healthy food consumption. These individuals also reported worse general health and quality of sleep. The IM4 statement, related to feeling as if you can do anything you set your mind to, was associated with the second most health behaviors at 3. This statement was reflective of stronger self-efficacy and internal locus of control. Positive Pearson correlations were found for quality of sleep, healthy eating habits, and general health, indicating that individuals agreed more with the statement were more likely to indicate participation in these positive health behaviors.

The regression analysis supported many of the aforementioned findings but disproved any significant associations with body weight and alcohol consumption as a means of coping with stress when controlling for the other independent variables included in the study. This was deduced based on the ANOVA tests having a p-value greater than 0.05 during the regression analysis.

CONCLUSION

Overall, significant associations were found with both religiousness and internal motivations when it comes to health behaviors, and the hypotheses were supported. How often an individual attends their place of worship was found to be a less effective metric than the extent an individual considers themselves religious and how often they use religion to cope when trying to explore religiousness. The religiousness metrics were in large part found to be associated with an increase in positive health behaviors but were not as significant of a predictor when looking at negative health behaviors.

Feeling helpless when dealing with some problems in their life (IM3) was associated with the largest decrease in positive health behaviors and the largest increase in negative health behaviors. Feeling capable of doing almost anything they set their mind to (IM4) was associated with the largest number of beneficial health behaviors.

These findings indicate the importance of considering the influences that religiousness and internal motivations may have on human health behaviors.

Limitations

There are multiple important limitations that should be mentioned. Based on the nature of the questions, especially regarding negative health behaviors such as junk food consumption, respondents may not have been truthful during the survey. Additionally, since the survey was administered over the course of a few semesters, some of the time overlapped with when COVID pandemic concerns were especially high. This may have impacted how respondents answered internal motivation statements as well as the frequency of place of worship attendance. Furthermore, the survey was mainly offered to UCF students enrolled in a sociology course, with

female respondents making up over 75% of the respondents and the average age being around 21. Consequently, these findings may not be generalizable to a larger population.

Implications and Future Directions

The potential implications of this study are vast, ranging from healthcare provider treatment practices to larger-scale public health policies or efforts. Due to the significant associations found related to some of the internal motivation statements health care practitioners may consider taking the time to determine and improve the internal motivations of patients as part of their treatment plans. These efforts may be rewarded with patients being more responsive to treatment plans and promote their participation in positive health behaviors. Based on the study's substantial findings, positive health interventions may be inclined to evaluate how religion and internal motives may influence an individual's development of particular health habits.

Future research may go more into the influence of religion, specifically if various religions encourage or discourage certain health practices. Additionally, future work may consider the effects of other potential mediators, such as race and age, during analysis. Moreover, research may be undertaken to determine which strategies might boost an individual's internal motivations, making them more inclined to participate in favorable health behaviors.

APPENDIX A: SURVEY QUESTIONS

1. Are you age 18 or older?
    a. Yes
    b. No

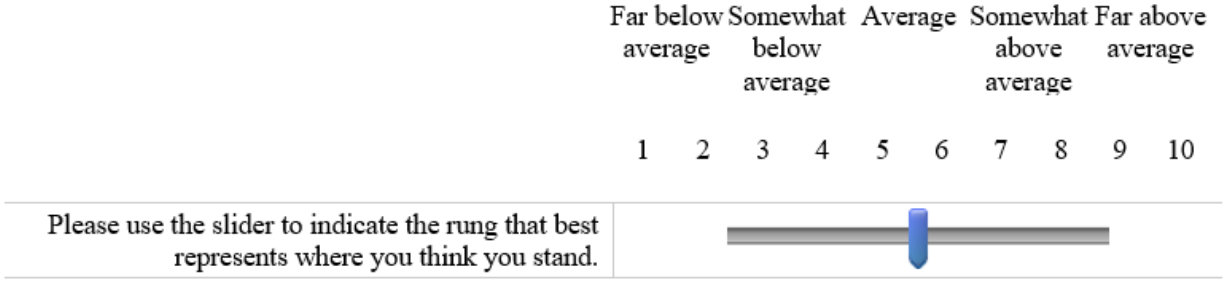
2. What is your age?

3. What is your race?
    a. White
    b. Black
    c. American Indian or Alaska Native
    d. Asian
    e. Native Hawaiian or Pacific Islander
    f. Other

4. What is your ethnicity?
    a. Hispanic or Latino
    b. Not of Hispanic or Latino origin

5. What is your gender?
    a. Male
    b. Female
    c. Non-binary / third gender
    d. Prefer not to answer

6. Imagine a ladder with 10 rungs (steps). At the top of the ladder (rung 10) are the people who have the most money, most education, and best jobs. At the bottom (rung 1) are the people who have the least money, least education, worst jobs, or no job. Where would you place yourself on this ladder currently?



*Note: from MacArthur Scale of Subjective Social Status

7. The following few questions will be used to assess the extent of your religiosity. On a scale of 1-10 with 1 being the least and 10 being the most, to what extent would you consider yourself religious?

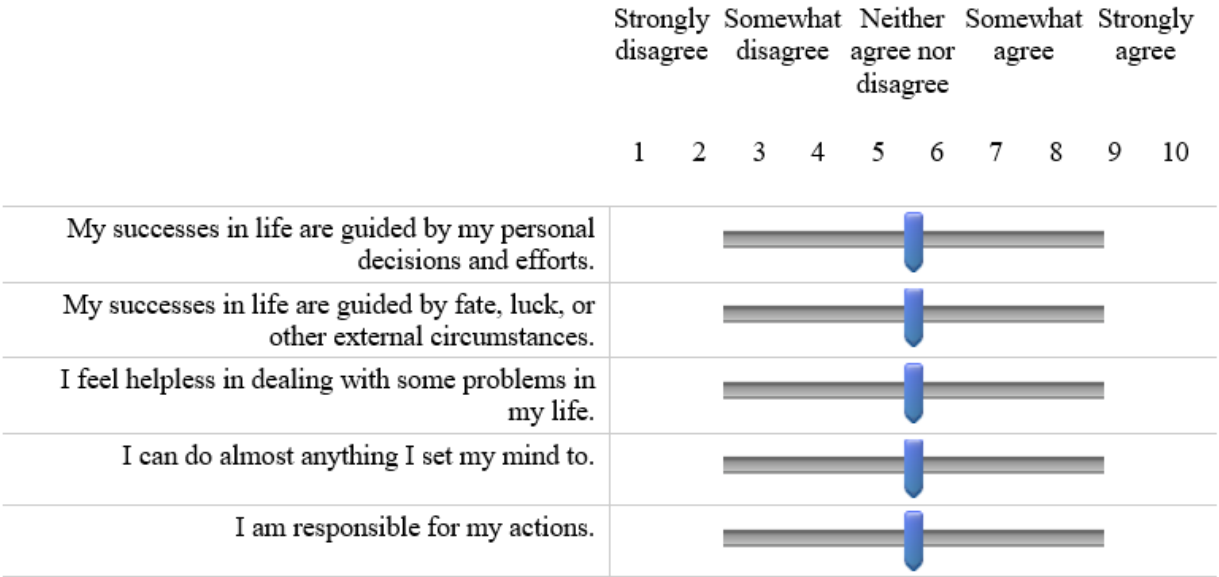
	None at all		A little		A moderate amount		A lot		A great deal	
	1	2	3	4	5	6	7	8	9	10
Please use the slider to indicate your response.										

8. On a scale of 1-10 with 1 being the least and 10 being the most, how often do you turn to religion to help you deal with problems in your life?

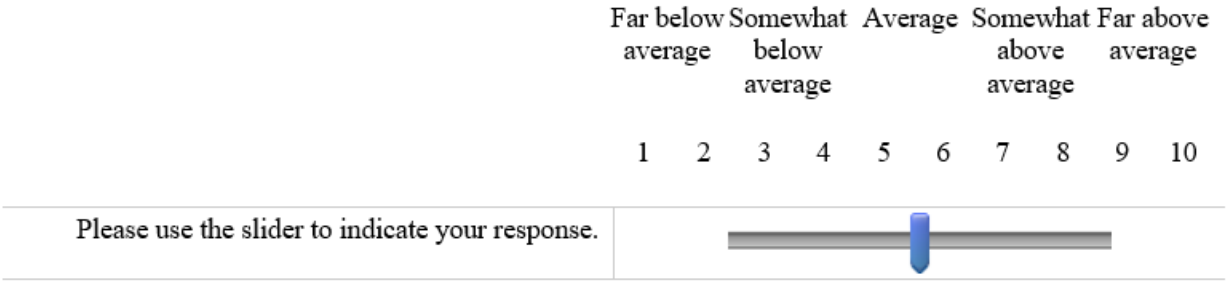
	Never		Sometimes		About half the time		Most of the time		Always	
	1	2	3	4	5	6	7	8	9	10
Please use the slider to indicate your response.										

9. Which best describes how often you attend your place worship (includes religious services or ceremonies)?
    a. Never
    b. Once or twice a year
    c. Several times a year
    d. Once a month
    e. Several times a month
    f. Once a week or more
    g. Prefer not to answer

10. The following set of statements will be used to assess your internal motivations and mindset. On a scale of 1-10 with 1 being the least and 10 being the most, please indicate the extent to which you agree with the following statements:

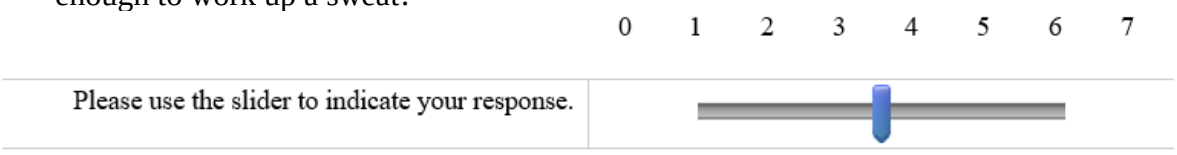


11. These last set of questions will be used to analyze your health behaviors. On a scale of 1-10 with 1 being the least and 10 being the most, how would you describe your general health?



12. Do you have any health problems that limit your physical activity?
    a. No
    b. Yes
    c. Unsure
    d. Prefer not to answer

13. In the past month, on average how many days per week (0-7 days) did you exercise long enough to work up a sweat?



14. In the past week (0-7 days), how many days did you wake up feeling well rested?

0 1 2 3 4 5 6 7

Please use the slider to indicate your response.

15. On a scale of 1-10 with 1 being the least and 10 being the most, how would you rate your overall habits of eating healthy foods?

Terrible Poor Average Good Excellent

1 2 3 4 5 6 7 8 9 10

Please use the slider to indicate your response.

16. How would you describe your body weight?
    a. Very underweight
    b. Slightly underweight
    c. About average weight
    d. Slightly overweight
    e. Very overweight

17. In the past 14 days how many days did you use a nicotine related product (includes cigarettes, vapes, hookah, etc.)?

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14

Please use the slider to indicate your response

18. How likely are you to turn to alcohol as a method of coping with stress?
    a. Extremely unlikely
    b. Somewhat unlikely
    c. Neither likely nor unlikely
    d. Somewhat likely
    e. Extremely likely
    f. Not applicable
    g. Prefer not to answer

19. How likely are you to turn to junk food as a method of coping with stress?
    a. Extremely unlikely
    b. Somewhat unlikely
    c. Neither likely or unlikely
    d. Somewhat likely
    e. Extremely likely
    f. Prefer not to answer

20. How likely are you to participate in mindfulness-based exercises (includes yoga and meditation) as a method of coping with stress?
    a. Extremely unlikely
    b. Somewhat unlikely
    c. Neither likely nor unlikely
    d. Somewhat likely
    e. Extremely likely

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