LEADERSHIP AND HEALTH: AN EXAMINATION OF AUTHENTIC LEADERSHIP
CHARACTERISTICS AND PHYSICAL HEALTH BEHAVIORS

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The undersigned, appointed by the dean of the Graduate School, have examined the dissertation entitled

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I am truly grateful to everyone who has encouraged me, both emotionally and financially, on this roller coaster ride. To my friends and family who have been my supporters through this journey in graduate school and to my grandmothers and grandfathers who are rooting for me from up above, I could not have done this without you. The support I have received from my friends, family, and colleagues has been amazing. This is dedicated to my cheerleaders.

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ABSTRACT

The purpose of this study was to examine the relationship between authentic leadership characteristics and physical health behaviors, as defined by the Goolsby Leadership Model (Quick, Macik-Frey, & Cooper, 2007). Physical health was measured by physical activity, cigarette smoking, and fruit and vegetable consumption, which are three of four controllable health risk factors that are related to many of the negative consequences of chronic disease (National Center for Chronic Disease Prevention and Health Promotion, 2009). Authentic leadership was measured using the Authentic Leadership Questionnaire (ALQ) by Walumbwa et al. (2008), which measured four components of authentic leadership and produced an overall authentic leadership score.

The overall leadership score did not have any significant relationships with the physical health behaviors but three authentic leadership components did have significant relationships with physical health. Specifically, self-awareness had significant relationships with physical activity and fruit consumption. Balanced processing had a significant relationship with physical activity and vegetable consumption and internalized moral perspective had a significant relationship with fruit consumption. Cigarette smoking did not have any significant relationships with the four components or the total authentic leadership score. While leadership behaviors and physical health do not have a strong relationship, they are both important in the workplace.

CHAPTER 1: INTRODUCTION

Problem Statement

Obesity rates in adults have been rising over the last twenty years and obesity rates in children and adolescents have increased since the 1990's. While the number of overweight adults has remained steady from 1990 to 2010 (33% in 2010) (Fryar, Carroll, & Ogden, 2012b), the number of obese adults has risen from 23% to 36% (Ogden, Carroll, Kit, & Flegal, 2012). Furthermore, the number of extremely obese adults has doubled in the last 20 years, from 3% to 6% (Fryar et al., 2012b). Obesity rates in boys aged 2-19 has jumped from 10% in 1990 to 19% in 2010. In girls, that number has increased from 10% in 1990 to 15% in 2010. (Fryar, Carroll, & Ogden, 2012a). "Obesity has emerged as a priority in chronic disease prevention and has been linked to increased risk for heart disease, high blood pressure, type 2 diabetes, arthritis-related disability, and some cancers" (National Center for Chronic Disease Prevention and Health Promotion, 2009, p. 4). This organization is housed under the Centers for Disease Control (CDC) and has a mission of promoting health and preventing chronic disease. Their research highlights the critical relationship of obesity and the many chronic diseases that impact quality of life for Americans.

Approximately 10% of Americans reported that they are in fair or poor health (National Center for Health Statistics, 2011a). While that statistic may not seem alarming, 24% of adults over age 65 conveyed being in fair or poor health (National Center for Health Statistics, 2011a). In 2008, 107 million Americans (or 1 in 2 Americans aged 18 and older) were reported to have at least 1 of 6 chronic conditions:

cardiovascular heart, arthritis, diabetes, asthma, cancer, or chronic obstructive pulmonary disease (COPD) (United States Department of Health and Human Services, 2014).

As the population ages, the health of our nation continues to be a concern. For example, it is projected that by 2050, one in three to one in five adults will have diabetes, compared to one in ten adults in 2010 (United States Department of Health and Human Services, Centers for Disease Control, 2010). Diabetes is a chronic condition that can be prevented or managed, but can have life-threatening effects if it is not managed properly or goes undiagnosed (Duyff, 2012). Diabetes increases risk for other diseases and impacts quality of life (Donatelle, 2002) and people with diabetes have twice the medical costs as those without diabetes (United States Department of Health and Human Services, Centers for Disease Control, 2010). Hypertension (high blood pressure) and high cholesterol rates have been on the rise since the 1990's, which is a concern because both raise risk for developing cardiovascular disease, the number one cause of death in adults (National Center for Health Statistics, 2013). Diabetes, hypertension, and high cholesterol are all conditions that can be prevented through participation in healthy behaviors, such as being physically active, healthy eating, and not using tobacco products (Donatelle, 2002).

The management of chronic health conditions and diseases are costly and involve large financial burdens for individuals, as well as organizations. "Chronic diseases and their major risk factors place huge economic demands on our nation" (National Center for Chronic Disease Prevention and Health Promotion, 2009, p. 7). The United States spends significantly more on health care than other nations, over twice the average of

other developed countries (National Center for Chronic Disease Prevention and Health Promotion, 2009). In 2011, personal health care expenditures totaled $2.3 trillion (National Center for Health Statistics, 2013). Almost 25% of adults aged 18-44 were uninsured in 2012, which is related to access to health care services (National Center for Health Statistics, 2013). These are just a few examples of concerning health statistics. Many organizations have a vested interest to educate our nation and to improve our health. Health prevention and promotion are important missions of many local and national organizations.

Participation in healthy behaviors results in better health, better wellness, enhanced quality of life, and improved functioning (Donatelle, 2002). Health prevention efforts and healthy behaviors also help decrease health care and medical expenditures. Four controllable health risk factors – lack of physical activity, poor nutrition, tobacco use, and excessive alcohol consumption – are related to many of the negative consequences of chronic disease (National Center for Chronic Disease Prevention and Health Promotion, 2009). Health promotion education and programs to improve physical activity, healthy eating, quitting tobacco, and decreasing alcohol consumption can go a long way in improving the health of our nation. "Evidence indicates that with education, social support, and healthy policies and environments, people can and will take charge of their health" (National Center for Chronic Disease Prevention and Health Promotion, 2009, p. 11). Education, social support, healthy policies, and a healthy environment are vital in health prevention and management of chronic diseases.

A person's environment plays a key role in influencing healthy or unhealthy behaviors. The social ecological model (Stokols, 1992) emphasized the interactions between the environment and individual health. According to the social ecological model (Stokols, 1992), both the physical environment (safe location, opportunities to make healthy eating choices, or ability to walk) and the social environment (family members, friends, and co-workers) have influences on individual health. One example of an environment that can influence health is the workplace. Many Americans spend between 20 hours (12%) and 50 hours (30%) of their weekly time in the workplace. Personal and professional lives may blend together as individuals climb the ladder to success.

"The workplace is often regarded as one of the most important settings for health promotion" (Eriksson, Axelsson, & Axelsson, 2011, p. 75). In a study by Ettner and Grzywacz (2001), 50% of workers reported a positive impact of their job on their physical and mental health. Organizations seek leaders to empower others, manage struggles for change, impact the learning culture, and bring important skills for improvement. Leadership is about inspiration, support, and human relations, but so is a healthy workplace (Eriksson et al., 2011).

Business, corporations, and organizations not only have formal leaders, especially in positions of authority, but also have informal leaders. The leaders may be defined (for example, an office manager) or may emerge because of their skills and abilities in a more informal manner. Organizations vary in their structure, so leadership may be more related to position authority, or can be evident throughout all levels of organizations. Regardless of the how leadership is defined in organizations, all leaders have influence to

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promote a healthy environment. "Leaders' challenge has been to keep themselves and those with whom they work healthy, happy, and productive in the service of the organization" (Quick & Quick, 2004, p. 331). Leadership is necessary in workplaces for high-functioning organizations at all levels, not just management.

Obesity rates are rising, chronic health conditions are increasing, and health is a nation-wide concern. Many people know they need to take care of their health, but they do not participate in health-promoting behaviors. There are several behaviors that have an impact on promoting health and increasing lifespan (Donatelle, 2002). Three of these health behaviors are cigarette smoking, physical activity, and healthy eating. Positive changes to physical health behaviors can lead to better health and better quality of life.

The link between leadership characteristics and health behaviors has not been well-researched. Prior research emphasized the importance of health promotion in the workplace (Eriksson et al., 2011; Ettner & Grzywacz, 2001) but not specifically leadership and physical health. Gurt, Schwennen, and Elke (2011) found a positive association between health-specific leadership (leadership behaviors related to assuming responsibility for employee health) and perceptions of organizational climate (events and work environment related to health). While their research was on health, it was not focused on physical health. Research by Kuoppala, Lamminpaa, Liira, and Vainio (2008) found an association between leadership and job well-being, but not specifically the physical health of employees. The researchers also noted the lack of well-founded research on the relationship between leadership and employee health and well-being

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(Kuoppala et al., 2008). Therefore, this research study can help add to the knowledge base on leadership and health.

Purpose

The purpose of this study was to examine the relationship between authentic leadership characteristics and physical health behaviors of MU Extension faculty and staff. Authentic leadership was self-reported and measured from an intrapersonal perspective using the Authentic Leadership Questionnaire (ALQ) developed by Walumbwa, Avolio, Gardner, Wernsing, & Peterson (2008). This research study also measured self-reported physical activity, smoking, and fruit and vegetable consumption in order to represent three physical health behaviors. Questions about health-related values helped make the connection between authentic leadership and physical health.

The main research question for this study was: Is there a relationship between authentic leadership characteristics and health behaviors (specifically physical activity, smoking, and fruit and vegetable consumption)? The main research question was further broken down into:

1. Is there a relationship between authentic leadership characteristics and physical activity?

2. Is there a relationship between authentic leadership characteristics and smoking?

3. Is there a relationship between authentic leadership characteristics and fruit and vegetable consumption?

Conceptual Framework

Authentic leadership is one theory of organizational leadership. Authentic leadership is being used because of the link between this leadership theory and positive individual and organizational health. Macik-Frey, Quick, and Cooper (2009) proposed a link between authentic leadership and a positive health model. Shirey (2006) suggested that authentic leadership is "the preferred style of leadership for creating and sustaining healthy work environments" (p. 264).

Authentic leaders can be described as genuine, trustworthy, real, and reliable (Luthans & Avolio, 2003). High integrity, value-driven, purposeful, committed, and character-based leaders represent authentic leadership (George, 2003). Authentic leaders are role models and contribute to a positive organizational climate (Gardner, Avolio, Luthans, May, & Walumbwa, 2005). One key factor that contributes to the development of authentic leadership is self-awareness of personal values, goals, emotions, and identity (Gardner et al., 2005). Authentic leaders base their actions on their deepest values.

The conceptual framework for this study is based on the Goolsby Leadership Model described by Quick, Macik-Frey, and Cooper (2007). The model connects three concepts: integrity, courage, and impact. Integrity includes the two key attributes of authenticity and emotional competence, which describe authentic leadership. One attribute of courage is character, which includes personal core values. Authentic leaders are driven by their personal values. Integrity and courage lead to impact, which includes individual health and organizational health. The Goolsby Leadership "suggests that the healthy leader has integrity, acts with courage and passion, and achieves high impact

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results for oneself, for other individuals, and for the organization" (Quick et al., 2007, p. 194).

Leaders need to have high levels of energy and productivity to face the challenges of leading an organization. Staying healthy and maintaining well-being can help authentic leaders stimulate progress, deliver results, and inspire others to value their health. This study determined the relationship between authentic leadership and three physical health behaviors.

Research Methodology

This study was a correlational post-positivist study utilizing survey research. A quantitative survey was used to determine the correlation between authentic leadership and physical health behaviors (precisely physical activity, smoking, and fruit and vegetable consumption). The online survey consisted of questions from the Authentic Leadership Questionnaire (Walumbwa et al., 2008), questions on health-related values, and questions measuring physical activity, smoking, and fruit and vegetable consumption. The health-related values questions were based on the terminal values ranking by Rokeach (1967) and a four-item assessment by Lau, Hartman, and Ware (1986). The physical activity, smoking, and fruit and vegetable questions were based on the questions from the Behavioral Risk Factor Surveillance System, but were modified to match current health recommendations.

The population used for the study was University of Missouri Extension faculty and staff and participation for the study was solicited via email invitation. A Qualtrics online survey was used to increase response rates and for the cost-effectiveness of this

technique. Data analysis included descriptive statistics, correlation, multiple regression, and logistic regression analyses to best answer the research questions.

Key Terms

A definition of key terms is included for uniformity and understanding throughout the paper. Terms without a citation were defined by the researcher.

Authentic leadership – "A pattern of leader behavior that draws upon and promotes both positive psychological capacities and a positive ethical climate, to foster greater self-awareness, an internalized moral perspective, balanced processing of information, and relational transparency on the part of leaders working with followers, fostering positive self-development" (Walumba et al., 2008, p. 94). The literature review includes a detailed explanation of authentic leadership.

Balanced processing – being objective and considering other perspectives before making decisions, one of the four authentic leadership components. (Northouse, 2010).

Body Mass Index (BMI) – The medical standard used to define obesity, based on the relationship from height to weight (Donatelle, 2002). BMI is an estimate of body fat, and a gauge of risk for diseases that occur with more body fat (National Heart, Lung, and Blood Institute, 2012).

Extreme obesity – A BMI of 40 and above, or 100 pounds over ideal weight (National Heart, Lung, and Blood Institute, 2012).

Internalized moral perspective – using moral standards to guide daily behavior, one of the four authentic leadership components (Northouse, 2010).

Overweight – A BMI of 25 to 29.9 (National Heart, Lung, and Blood Institute, 2012).

Obesity – A BMI of 30 to 39.9 (National Heart, Lung, and Blood Institute, 2012).

Physical Activity – Any bodily movement produced by the contraction of skeletal muscle that increases energy expenditure above a basal level or bodily movement that enhances health (United States Department of Health and Human Services, 2008).

Physical Health – One dimension of health and wellness that focuses on body and physical functioning. Cigarette smoking, fruit and vegetable consumption, and physical activity are examples of physical health behaviors.

Relational transparency – presenting one's true self to others, one of the four authentic leadership components (Northouse, 2010).

Self-awareness – knowing your core values, your identity, and awareness of personal thoughts and feelings, one of the four authentic leadership components (Northouse, 2010).

Self-efficacy – "A person's belief about whether he or she can successfully engage in and execute a specific behavior" (Donatelle, 2002).

Significance of the Study

This particular study added to the research base on connecting leadership and health. As our population and workforce get older, living a healthy lifestyle will continue to be emphasized. Health promotion and prevention efforts targeting schools, workplaces, and communities will grow in order to educate, inform, and motivate everyone to participate in healthy behaviors. The workplace is one environment where

health promotion can have an impact. Participation in physical activity, stopping smoking, and fruit/vegetable consumption are three healthy behaviors that can be influenced in the workplace.

As learning organizations and organizations that emphasize a leadership culture are more concerned with worksite wellness and employee health, this study helped to bridge the gap in this particular area of research. Organizations can use this research study to inform health promotion and leadership education and resources to create healthy and productive employees. Shirey (2006) said "authentic leadership may not only be crucial to creating and sustaining healthy work environments for practice but also may hold promise in creating lasting organizational and professional value" (p. 266).

On a local level, MU Extension can use this information for leadership development and employee health and wellness initiatives. Gurt et al. (2011) stated that leaders can set the agenda by bringing up the topic of health, modeling healthy behaviors, and communicating and supporting health promotion activities. Research by Goetzel and Ozminkowski (2008) found that organizational health promotion programs improve employee health and impact organizational costs, such as health care costs, employee absenteeism, and productivity. Healthy employees lead to healthy organizations. Other state Cooperative Extension services may also find the information valuable in completing similar research studies for their use. Organizations that value a leadership culture may also find the information helpful in planning leadership and health promotion initiatives.

Summary

This research study is organized into five chapters. Chapter 1 presents an introduction to the study. Chapter 2 focuses on a review of relevant health literature, authentic leadership literature, conceptual framework, and research hypotheses. Chapter 3 details the research methods and design. Chapter 4 presents the data analysis. Chapter 5 provides a discussion of the research findings including the limitations, implications, recommendations and conclusions related to the study.

CHAPTER 2: LITERATURE REVIEW

The literature review is organized into five sections, which includes: dimensions of health, organizational/workplace health, conceptual framework, and a summary. The section on dimensions of health provides an overview of a broad definition of health and then continues into a more specific description of one dimension of health, which is physical health. The discussion on physical health continues to describe the three physical health behaviors being studied: cigarette smoking and tobacco use, fruit and vegetable consumption, and physical activity. The organizational/workplace health section defines health promotion in the environment being studied. Finally, the conceptual framework links together the workplace, the Goolsby Leadership Model, health values, and authentic leadership. The conceptual framework concludes with the research hypotheses and the chapter concludes with a summary.

Dimensions of Health

Health is a broad and multifaceted term that can be defined in many different ways. Because of the complexity of the description, it is necessary to look at health from a comprehensive and general meaning first. Donatelle (2002) described six dimensions of health: physical, social, emotional, mental, spiritual, and environmental. "Today, the terms health and wellness are often used interchangeably to mean the dynamic, ever-changing process of trying to achieve one's individual potential in the physical, social, emotional, mental, spiritual, and environmental dimensions " (Donatelle, 2002, p. 3). Wellness is also synonymous with health and can mean the highest level of functioning relative to those six dimensions of health. The World Health Organization (WHO)

(2003) defined health as, "The state of complete physical, mental, and social well-being, not just the absence of disease of infirmity" (p. 1).

The six dimensions of health, as defined by Donatelle (2002), are mental health, social health, emotional health, environmental health, spiritual health, and physical health. Mental health is psychological well-being and involves using mental capacity effectively, dealing with stress, productive work, and living up to one's potential. Social health has to do with engaging in relationships with others and having a pleasant social life. Emotional health refers to our feelings; both controlling and expressing emotions. It also includes the qualities of trust, love, self-esteem, and self-confidence (Donatelle, 2002).

Environmental health is "appreciation of the external environment and the role individuals play in preserving, protecting, and improving environmental conditions" (Donatelle, 2002, p. 4). Spiritual health encompasses beliefs, values, religion, understanding our purpose in life, and care of all living things. It also includes feelings related to life experiences, including joy, peace, sorrow, contentment, love, and pain (Donatelle, 2002).

Physical health is one dimension of health and wellness, but typically receives more focus than the other dimensions. Physical health emphasizes body functioning, the ability to perform daily activities with ease, energy, and prevention of sickness (Donatelle, 2002). While optimal wellness includes the health of all dimensions, physical health plays a major role in our lives. Physical health includes medical examinations and screenings, participation in physical activity, healthy eating, not using tobacco,

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vaccinations, getting enough sleep, weight management, and having enough energy throughout the day (Donatelle, 2002). This study will have a narrow focus on physical health through the three behaviors of smoking, fruit and vegetable consumption and physical activity, which will be discussed in more detail in the literature review.

Physical Health

As stated in the opening paragraph, overweight and obesity rates have continued to increase over the last thirty years. Overweight is defined as having a BMI (body mass index, a measure of height versus weight) of 25 to 29.9, and obese is defined as having a BMI of 30 and above (Donatelle, 2002). Extreme obesity is defined as a BMI of 40 and above, or 100 pounds over ideal weight (National Heart, Lung, and Blood Institute, 2012). It is known that obesity raises risk for the leading causes of death (Donatelle, 2002) and impacts quality of life. Individuals who participate in healthy behaviors can lower their risk for overweight and obesity and enjoy better functioning and quality of life. There are controllable and uncontrollable factors that put individuals at higher risk for certain diseases and conditions. Genetics, family history, sex, race and ethnicity are uncontrollable. Some controllable behaviors that influence physical health include not using tobacco or smoking, healthy eating, and participation in physical activity. Healthy eating and participating in physical activity also reduces risk for overweight and obesity, which are risk factors for many chronic conditions.

Donatelle (2002) listed eight key behaviors that will help people live longer: getting a good night's sleep, maintaining healthy eating habits, managing weight, participating in physical recreation activities, avoiding tobacco products, practicing safer

sex, limiting intake of alcohol, and scheduling regular self-exams and medical checkups. (p. 15). This research study will measure smoking (to represent tobacco use), fruit and vegetable consumption (one way to represent healthy eating), and physical activity to represent physical health.

Cigarette smoking and tobacco use. Cigarette smoking and tobacco use is related to at least 25 diseases (Donatelle, 2002). The health hazards of smoking include increased risk for cancer, cardiovascular disease, respiratory disorders, and gum disease (Donatelle, 2002). Tobacco use is the single most preventable cause of death in the United States (McGinnis & Foege, 1993) and smoking is the most common form of tobacco use. As of 2011, 19.3% of adults are current smokers. When broken down by sex, 21.2% of males are smokers and 17.5% of female are smokers (National Center for Health Statistics, 2011b). More public spaces are becoming smoke-free due to the relationship between secondhand smoke and health conditions.

Health awareness nationwide has led to a decrease in the use of tobacco among adults (Donatelle, 2002). Nevertheless, smoking rates hover around 20% for adults (National Center for Health Statistics, 2011b), meaning that one in five adults smoke cigarettes. Nicotine is a powerful drug and smoking is a complicated behavior (Donatelle, 2002). When tobacco is burned in a cigarette, nicotine is released and inhaled into the lungs, along with over 4,000 other dangerous chemicals (Donatelle, 2002). The drug nicotine is delivered to the brain in seconds and provides a stimulant response which leads to an aroused and alert mental state (Donatelle, 2002). Nicotine increases

adrenaline, increases heart rate, increases breathing, constricts blood vessels, and decreases hunger (Donatelle, 2002).

Paired associations, such as a chemical "pairing" between alcohol and tobacco, will increase cravings for nicotine. When the brain is used to the "pairing," displeasure will occur when that paired association is missing (Donatelle, 2002). "Nicotine addiction may be one of the toughest addictions to overcome. Smokers' attempts to quit lead to withdrawal symptoms" (Donatelle, 2002, p. 369). Quitting smoking involves breaking both the addition to nicotine and the habit of smoking (Donatelle, 2002).

There is sufficient evidence of smoke-free policies at the workplace to reduce tobacco use (Task Force on Community Preventive Services, 2010). Smoke-free policies may enact a complete ban on tobacco use or limit it to specific areas in the workplace. A workplace may adopt a smoke-free workplace with or without health promotion interventions such as smoking cessation courses or materials. Smoking cessation programs are one available resource for smokers in worksite health promotion programs.

Fruit and vegetable consumption. The 2010 Dietary Guidelines recommendations for fruit consumption are between one and 2 ½ cups daily, depending on calorie level (United States Department of Agriculture and United States Department of Health and Human Services, 2010). For vegetables, the 2010 Dietary Guidelines recommendation is between one and four cups daily, depending on calorie level (United States Department of Agriculture and United States Department of Health and Human Services, 2010). The general recommendation from the 2010 Dietary Guidelines is two cups for fruits and 2 ½ cups for vegetables daily, based on 2,000 calories a day (United

States Department of Agriculture and United States Department of Health and Human Services, 2010). According to the MyPlate consumer guidelines from the United States Department of Agriculture (USDA), half of our plate should be composed of fruits and vegetables. Healthy People 2010 (a framework for the nation's health priorities) listed objectives for fruit and vegetable consumption. The Healthy People 2010 goal was 75% of Americans consuming two or more servings of fruit per day and 50% of Americans consuming three or more servings of vegetables per day (Centers for Disease Control, 2009). In 2009, only 33% of adults were meeting the recommendation for fruit and 27% were meeting that recommendation for vegetables. Only 14% of adults were meeting the recommendations for both fruits and vegetable consumption (a total of five servings of fruit and vegetables combined) (Centers for Disease Control, 2009). In 2013, 38% of adults report they consumed fruits less than one time daily and 23% report they consumed vegetables less than one time daily (Centers for Disease Control, 2013b). In the US, the median reported fruit consumption is 1.1 times daily and median vegetable consumption is 1.6 times daily (Centers for Disease Control, 2013b). Awareness of those recommendations has increased over the last 20 years, but that awareness has not translated to behavior change (Centers for Disease Control, 2011). Trends in fruit and vegetable consumption demonstrate that consumption has changed little between 2000 and 2009 (Centers for Disease Control, 2011).

Low consumption of fruits and vegetables can be linked to various reasons. Access to a variety of fruits and vegetables is one. Research studies have shown an association between access and proximity to food outlets and diet (Centers for Disease

Control, 2013b). "Creating greater access to quality and affordable fruits and vegetables nationwide is an important step to increase fruit and vegetable consumption" (Centers for Disease Control, 2013b, p. 2).

Cost of fruits and vegetables can be another barrier to increasing consumption. Similarly, availability of cost-effective fruits and vegetables can be a barrier. Increasing food pantry supplies of fruits and vegetables, nutrition assistance programs subsidies for fruits and vegetables, and purchase of local fruits and vegetables (Centers for Disease Control, 2011) can lessen this barrier. Nutrition education to inform consumers of ways to save money by purchasing seasonal fruits and vegetables, purchasing different forms of fruits and vegetables based on price comparisons (canned, fresh, frozen, or dried), and knowledge to grow their own fruits and vegetables can also help to overcome this barrier.

The Centers for Disease Control (2009) identified key strategies for improved fruit and vegetable consumption: increased access to fruit and vegetables, increased availability to fruit and vegetables, and reduced price are those key strategies to improve nutrition among all Americans. Many states are working to improve fruit and vegetable consumption by improving access and establishing policies that make it easier for communities, schools, and child care centers to have fruits and vegetables (Centers for Disease Control, 2013b). Access to stores that provide a variety of fruits and vegetables, farmer's markets, improvements to nutrition assistance programs, and food system support (getting the food from the farmer to the consumer) improve fruit and vegetable consumption (Centers for Disease Control, 2013b). "Individuals who eat a diet rich in

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vegetables are likely to be healthier than those who do not, regardless of weight (Lesser & Puhl, 2014, p. 429).

Physical activity. Less than half (48%) of adults are meeting the aerobic physical activity recommendations and less than one-fourth (24%) are meeting the muscle strengthening recommendations from the 2008 Physical Activity guidelines (National Center for Health Statistics, 2011a). Only 20% of adults are meeting both the aerobic and muscle strengthening recommendations from the 2008 Physical Activity guidelines (National Center for Health Statistics, 2011a; Centers for Disease Control, 2013a). The 2008 Physical Activity guidelines were developed by the United States Department of Health and Human Services. According to those guidelines, adults should get at least 150 minutes of moderate aerobic physical activity weekly (75 minutes of vigorous activity) and participate in muscle strengthening activities twice a week (United States Department of Health and Human Services, 2008). Reasons for not being physically active include a lack of time, busy schedules, lack of knowledge about what activities to do, lack of motivation, or physical limitations (Donatelle, 2002).

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Organizational/Workplace Health

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Americans who are employed full-time spend about 20% of their weekly time working or at work. Eating healthy, not smoking, and being physically active are challenges that adults who are employed full-time may face due to time constraints, stress, high workloads, or managing work-life balance. Effective worksite health programs have a goal of improving worker health and health practices through social supports (Glanz, Rimer, & Viswanath, 2008). Health promotion activities in an

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organization help promote positive changes and reduce negative behaviors (Donatelle, 2002). "Balancing work, family, and oneself (including physical health) in a dynamic process may in fact lead to health, happy, and productive results" (Quick & Quick, 2004, p. 334). Role modeling and encouragement by colleagues, worksite health promotion, incentives for participating in healthy behaviors, and wellness resources can all positively influence participation in healthy behaviors (Donatelle, 2002). Quick and Quick (2004) realized that "leaders have a responsibility for individual and organizational health" (p. 330)

As stated in the previous paragraph, workplace health is important because Americans who are full-time employees spend about one-fourth of their weekly time working or at work. The workplace is one important setting for health promotion (Eriksson et al., 2011). Maintaining health can be challenging for employees who have stressful work environments or jobs, for those who work long hours and may have less time to participate in healthy behaviors such as physical activity, and balancing their personal time with work time.

On the flip side, staying healthy can benefit not only employees, but employers. Health promotion programs increases the chance that employees will be successful on their path to positive health and wellness (Donatelle, 2002). Poor health affects employee productivity and workers in poor health have higher absenteeism, higher turnover, and decreased productivity (Goetzel & Ozminkowski, 2008). One employee's poor health can also impact the performance of colleagues who work nearby (Goetzel & Ozminkowski, 2008). "Suffering and health problems can drain positive energy

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otherwise used to achieve happiness and productivity" (Quick & Quick, 2004, p. 330).

Lesser and Puhl (2014) agreed that while employees should exert personal responsibility for their own health, expectations to improve health without consideration of the environmental factors may not be sufficient or effective. Worksite health promotion programs can improve the health and productivity of employees (Goetzel & Ozminkowski, 2008). The goal of many workplace health promotion programs is to provide services to give professionals the information and tools they need to improve their health, to help reduce their medical costs, and to help them increase their work productivity (Mitchell, Ozminkowski, & Serxner, 2013). Research by Mitchell et al. (2013) found that employees who participated in health promotion programs improved the employees' productivity and resulted in cost-savings for the employers. Poor employee health results in substantial financial and productivity costs to employers (Task Force on Community Preventive Services, 2010).

Health promotion programs may focus on primary, secondary, or tertiary prevention. Primary health promotion programs target already healthy individuals or those who can still prevent diseases and health conditions from occurring. Primary prevention programs could include fitness or physical activity programs, education on healthy eating, weight management, or stress management (Goetzel & Ozminkowski, 2008). Secondary prevention health promotion programs include individuals who are at higher risk for disease or health conditions because of lifestyle or may have been categorized at higher risk due to certain measurements (overweight, high blood pressure, high cholesterol). Examples of secondary prevention health promotion programs include

smoking cessation classes, health screenings, classes to teach management of certain health conditions, or medication management. (Goetzel & Ozminkowski, 2008). Tertiary prevention is also known as disease management and helps participants manage or control chronic conditions.

"When worksite health promotion programs are grounded in behavior theory, implemented effectively using evidence-based principles, and measured accurately, they are more likely to improve workers' health and performance" (Goetzel & Ozminkowski, 2008, p. 310). Several key components are found in successful health promotion programs, one of those being a healthy organizational culture. Goetzel and Ozminkowski (2008) noted, "Workplace programs embedded within a healthy company culture are more likely to succeed" (p. 314). Higher participation rates is also another component of successful health promotion programs (Goetzel & Ozminkowski, 2008). Leaders within an organization can influence colleagues to participate in health promotion activities, thus increasing participation rates. Incentive programs that reward healthy behaviors (such as participation in physical activity, healthier eating, and stopping tobacco use) for all employees could offer a broad approach to which everyone could become healthier (Lesser & Puhl, 2014).

The Task Force on Community Preventive Services (2010) analyzed workplace health promotion interventions and developed recommendations for specific interventions. Their work recommends three areas of health promotion activities: (a) assessment of health behaviors; (b) feedback regarding health behaviors; and (c) intervention using health promotion programs. In relation to the three physical health

behaviors this dissertation will focus on, the Task Force found evidence of improvement

for: tobacco cessation (on the basis of strong effectiveness) and improving measurements

of physical activity (on the basis of sufficient evidence of effectiveness). However, their

research did not find sufficient evidence to improve dietary intake of fruits and

vegetables, due to the small increase in consumption (Task Force on Community

Preventive Services, 2010).

Healthy individuals and healthy leaders cultivate healthy organizations (Quick et

al., 2007). All six dimensions of health (physical, social, emotional, mental, spiritual,

and environmental) are necessary components of health promotions within organizations.

Quick et al. (2007) described a positive approach to health that "captures human thriving

as well as flourishing – physically, mentally, and socially" (p. 191). Quick et al. (2007)

noted that "healthy organizations would emphasize, facilitate and support the various

categories of health for its members" (p. 192). Relative to health promotion,

"Organizational policies and social norms can help guide certain behaviors and

discourage others" (Goetzel & Ozminkowski, 2008, p. 306).

Conceptual Framework

On the surface, leadership and health may not seem intertwined. As described in

the above sections, leadership can create a culture of organizational health and influence

participation in health-promoting activities for employees. Authentic leadership is one

particular theory of leadership that can be linked to health. Positive health can be related

to effective authentic leadership because authentic leaders strive to enhance their health

of their followers (Macik-Frey et al., 2009). Kuoppala et al. (2008) stated there is a lack

of research studies that determine the relationship between leadership and employee health. Their research found an association between leadership and job well-being (Kuoppala et al., 2008) but was not focused on physical health, as this study did. The conceptual framework for this study explains the dynamics of authentic leadership, three physical health behaviors, and workplace health.

Authentic Leadership

Effective leadership is necessary for organizations, institutions, and government to function and be productive and efficient. Leadership can be defined various ways for different individuals, so for the purpose of this study, leadership was defined as, "a process whereby an individual influences a group of individuals to achieve a common goal" (Northouse, 2010, p. 3). "Leaders are highly complex beings, people who have distinctive qualities that cannot be sufficiently described by lists of traits of characteristics" (George, 2007, p. xxvii). Leadership is not the same as management. Any individual within an organization can be defined as a leader, not just those who are in supervisory or management positions. Just as there are many definitions of leadership, there are also many theories relative to leadership. One emergent theory is authentic leadership, which means that leaders are genuine, real, and live by their values (Northouse, 2010). George (2003) said, "We need leaders who build enduring organizations, motivate their employees to provide superior customer service, and create long-term value for shareholders" (p. 9). Authentic leaders also live a balanced life (George, 2003; George, Sims, McLean, & Mayer, 2007).

Avolio, Gardner, Walumbwa, Luthans, and May (2004) said "we conceive of authentic leaders as persons who have achieved high levels of authenticity in that they know who they are, what they believe and value, and they act upon those values and beliefs while transparently interacting with others" (p. 802). Northouse (2010) described authentic leadership as "leadership that is transparent, morally grounded, and responsive to people's needs and values" (p. 237). However, there is no single agreed upon definition of authentic leadership. Researchers define the concepts related to authentic leadership with similarities among those perspectives. Multiple researchers also define authentic leadership as having four components: (a) self-awareness; (b) internalized moral perspective; (c) balanced processing; and (d) relational transparency (George, 2003; Ilies, Morgeson, & Nahrgang, 2005; and Walumba et al., 2008). These are the same four components used in the Authentic Leadership Questionnaire (ALQ) developed by Walumbwa et al. (2008).

Self-awareness is knowing your core values, your identity, and awareness of personal thoughts and feelings (Northouse, 2010). Internalized moral perspective means using your moral standards to guide your daily behavior (Northouse, 2010). Balanced processing is about being objective and considering other perspectives before making decisions. (Northouse, 2010). Relational transparency means that you present your true self to others (Northouse, 2010). These four components of authentic leadership are a theoretical approach developed by Walumbwa et al. (2008).

George's (2003) theory is a practical approach and noted that authentic leaders demonstrate five qualities: "(a) understanding their purpose; (b) practicing solid values;

(c) leading with heart; (d) establishing connected relationships; and (e) demonstrating self-discipline" (p. 18). Those qualities are not static and develop continuously in leaders. According to George (2003), each dimension can be related to a developmental quality. Those developmental qualities are: (a) values and principles; (b) integrated life; (c) self-awareness (at the center); (d) motivations; and (e) support team. All leaders must define their personal values. Practicing wellness and living a healthy lifestyle could be strong values for a leader, which means they will practice healthy behaviors. If a leader places importance of their value of personal wellness, others will take note of this characteristic. Self-awareness is one central concept of authentic leadership (George, 2007). Self-confidence is one important skill of self-awareness. Taking care of our physical health is one way to improve our overall self-awareness. Physical health is related to intrinsic motivation, which is one developmental area of authentic leadership.

Avolio et al. (2004) posited that authentic leaders are probable to stimulate personal identification among followers, which means that followers' values and beliefs become more similar to the leader. Authentic leaders serve as positive role models for followers by displaying their values, emotions, motives, goals, and genuine concern for followers (Gardner et al., 2005). "Positive modeling represents a basic means whereby authentic leaders impart positive values, emotions, motives, goals and behaviors for followers to emulate" (Gardner et al., 2005, pp. 358-359). This will be explored further in the conceptual framework.

Goolsby Leadership Model

The Goolsby Leadership Model "suggested that the healthy leader has integrity, acts with courage and passion, and achieves high impact results for oneself, for other individuals, and for the organization" (Quick et al., 2007, p. 194). The three concepts in the Goolsby Leadership Model are integrity, courage, and impact. Integrity is defined as authenticity and emotional competence, which describes authentic leadership. There is consistency between the values of an authentic leader and their actions and behaviors (Quick et al., 2007). Courage is defined by purpose, energy, and character. One component of character is core values, which is important in leadership because actions and behaviors are based on values and principles (Quick et al., 2007). The third component of the model is impact, which includes individual health and organizational health. Integrity (authentic leadership) and courage (values) then lead to healthy individuals and healthy organizations.

Health as a Value

As described in the Goolsby Leadership Model, an authentic leader who lives by their core values will result in improved individual and organizational health (Quick et al., 2007). The importance of health to an individual is thought to reflect upon their health behaviors (Smith & Wallston, 1992). "If a behavior is designed to improve, enhance or protect one's health, engaging in the behavior is more likely to occur if health is a desired outcome or a valued goal" (Smith & Wallston, 1992, p. 129-130). Rokeach (1973) also noted that people's values guide their behavior. Rokeach's (1967) terminal values scale is a common method of measuring health as a value (Lau et al., 1986). This

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scale is a ranking of 18 terminal values, with one being health. Lau et al. (1986) developed a shorter four-item Likert scale that can be used to measure health as a value. Both assessments represent methods of measuring how individuals value health.

McCormick (2001) linked the relationship between the self-confidence of a leader and Bandura's (1986) concept of self-efficacy and recognized this similarity. According to George's (2003) theory of authentic leadership dimensions and developmental qualities, the dimension of values and developmental quality of behavior can play a role in authentic leaders practicing and modeling healthy behaviors. If wellness and a healthy lifestyle are strong values for a leader, they will practice healthy behaviors.

Authentic leadership antecedents involve both the cognitive, affective, and spiritual dimensions are noted in one model proposed by Klenke (2007). Those three areas are similar to three of the dimensions of health (intellectual, emotional, and spiritual health). Klenke (2007) then linked authentic leadership to an authentic leadership culture, and then to organizational culture. This is one method of linking positive health to authentic leadership.

Many of these connections within authentic leadership are linked in the area of positive psychology. One important aspect of positive psychology is well-being and the holistic view of wellness, which is where physical health comes into play. One of the links between authentic leadership and positive psychology is a focus on competence, character strengths, and personal integrity (Quick & Quick, 2004). Positive psychology, positive organizational behavior, and authentic leadership are intertwined, with the organizational goal being health, happiness, and productivity of employees.

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Research Hypotheses

Leaders are more competent when they have the stamina and energy to be successful. Healthy employees are more productive and efficient, which leads to healthy organizations. Authentic leaders base their actions on their values, so when their physical health and well-being are important, it influences others. Based on the review of literature of health, workplace/organizational health, and the conceptual framework, I propose the following hypotheses:

- Authentic leadership characteristics (in those who value health) will be positively related to physical activity. Physical activity is a behavior which leads to positive physical health, so those that value health will also practice regular physical activity.

- Authentic leadership characteristics (in those who value health) will be negatively related to cigarette (tobacco) use. Cigarette and tobacco use have known negative health effects, so those who value health will not participate in this health behavior.

- Authentic leadership characteristics (in those who value health) will be positively related to fruit/vegetable consumption. Eating fruits and vegetables is a component of healthy eating, so those who value health will practice healthy eating behavior by eating fruits and vegetables.

Summary

This chapter described the major concepts of the research study. The goal of this research study was to determine the relationship between authentic leadership and three

physical health behaviors (physical activity, smoking, and fruit and vegetable

consumption). The concepts described in the literature review included general health,

physical health, workplace health, and the conceptual framework of the study. Chapter 3

will discuss the methods for the research study.

CHAPTER 3: METHODS

The purpose of this chapter is to describe information related to the participants and procedures used to collect and analyze the data for this dissertation. This research design and methods section includes the research purpose, research questions, research design, population and participants, data collection procedures, instrumentation, data analysis procedures, and summary.

Research Purpose

The purpose of this research study was to examine the relationship between authentic leadership characteristics and physical health behaviors of University of Missouri Extension faculty and staff. Authentic leadership was self-reported and measured from an intrapersonal perspective using the Authentic Leadership Questionnaire that measured four components of authentic leadership (Walumbwa et al., 2008). Two questions on health-related values were included to help explain the connection between authentic leadership and physical health. This research study also measured physical activity, smoking, and fruit and vegetable consumption (to represent healthy eating) to characterize three physical health behaviors.

Research Questions

Within the context of this study, the guiding research query for this study was: Is there a relationship between authentic leadership characteristics and health behaviors (specifically physical activity, smoking, and fruit and vegetable consumption)? The guiding research query was then further investigated with three research questions:

1. Is there a relationship between authentic leadership characteristics and physical activity?

2. Is there a relationship between authentic leadership characteristics and smoking?

3. Is there a relationship between authentic leadership characteristics and fruit and vegetable consumption?

Research Design

This study was a correlational post-positivist study. Creswell (2009) said, "The knowledge that develops through a post-positivist lens is based on careful observation and measurement of the objective reality that exists 'out there' in the world" (p. 7). Post-positivists assume that data shapes knowledge and the researcher collects information based on measures completed by participants (i.e. survey research). The scientific method, which is typically used in positivist research, tests a theory and collects data to support or refute that theory.

This research study was a quantitative non-experimental design using survey research. "Survey research provides a quantitative or numeric description of the trends, attitudes, or opinions of a population by studying a sample of that population" (Creswell, 2009, p. 13). Surveys are used to find out about individuals' thoughts, beliefs, and knowledge (Fink, 2009). The survey design was cross-sectional, because the data were collected at a single point (Fink, 2009). A quantitative non-experimental design using an online survey was chosen because the questions were designed to be self-reported and the responses were both categorical and numerical. Correlation was used to determine if

there was a relationship between authentic leadership characteristics and the three health behaviors (physical activity, smoking, and fruit and vegetable consumption) in order to answer the three research questions. Multiple and logistic regression were used to determine what variables correlated with authentic leadership characteristics and physical health behaviors when controlling for race, age, sex, education level, and health value ranking.

<div align="center">**Population and Participants**</div>

The population of MU Extension faculty and staff was used for this research study. The researcher is employed by MU Extension and has access to this group as a convenience sample. This organization provides faculty and select staff members with leadership and professional development opportunities and represented a heterogeneous sample for the researcher to study.

MU Extension has approximately 750 regional field faculty, campus faculty, and staff within many different departments. MU Extension faculty departments and specialty areas include administration, agriculture, business development, communications, community development, continuing education, human environmental sciences, human resources, technology services, and youth development. The entire population of MU Extension faculty and staff was used because leadership is developed and encouraged at all levels of the organization. Some research studies of leadership focus only on management or supervisory positions, but leadership can be observed throughout MU Extension. MU Extension faculty and staff may hold supervisory or management positions, but leadership is encouraged and developed in all faculty and staff

through formal professional development, informal self-directed learning, special projects, faculty-led initiatives, and teamwork. There is a wide variety in ages (age 21-74), sex, experience, race, and ethnic background in MU Extension faculty and staff, so the population will be heterogeneous in nature. MU Extension faculty and staff range in age of over 50 years, are represented by 69% female and 31% male, range in professional experience from less than 1 year to over 30 years, are represented by 46% faculty and 54% staff, and various ethnicities, races, religions, and cultural backgrounds.

The population for this research study was MU Extension faculty and staff with at least a .75 FTE Extension appointment. This FTE was chosen because many University of Missouri faculty members have a small Extension appointment, but faculty with a .75 FTE Extension appointment best represented the population. Some University of Missouri campus faculty members have a small Extension research appointment but their academic focus may be different than the work of MU Extension faculty with a .75 FTE or more appointment. MU Extension is a unique organization in that it has regional field faculty and staff and campus faculty and staff. Regional field faculty are non-tenure track faculty members and provide community education and resources across the state of Missouri. Campus and regional staff have various professional responsibilities. Campus faculty members have different FTE appointments and may work for several different departments. Because of the unique nature of the organization, faculty with .75 FTE will best represent MU Extension as an organization.

Generalizability

Results from this research study are only generalizable to MU Extension faculty and staff. The results were not generalizable to other government or non-profit organizations or to University of Missouri. Other state Cooperative Extension services or other community organizations may find the information valuable and may have a similar population, but the results are not generalizable to their organization.

Data Collection Procedures

This section discusses the procedures for data collection. Included in this section are approval, human subject protection, participation solicitation, and information about the online survey. The appropriate permission and approvals were obtained before data collection.

Approval

The researcher secured permission from MU Extension administration (Vice Provost/Director of Extension and two Associate Vice Provosts for Extension) before administering the survey and collecting data for the study. The study details were shared via personal communication and email communication with MU Extension administration. The Vice Provost and the two Associate Vice Provosts for MU Extension gave their approval via email communication with the researcher.

Human Subjects Protection

The researcher secured permission from the University of Missouri campus Institutional Review Board (IRB) before data collection. A copy of the IRB approval is included in Appendix A. Informed consent was obtained on the first page of the online

survey. A description of the study, the purpose, procedures, known benefits, and known risks were disclosed in the informed consent. Contact information for the campus IRB was also included in the informed consent. The informed consent form is included in Appendix B. The approximate time to complete the survey was disclosed, as well as a statement noting the survey was voluntary and respondents may refuse to participate or choose to end the survey at any time without penalty. Confidentiality of the responses was also noted in the informed consent. The researcher and advisor's contact information appeared at the bottom of the informed consent for participants to follow-up or ask questions in reference to the study. Individuals agreed to participate by selecting "yes, I agree to participate" on the first page of the online survey before continuing to question one of the survey.

Participation Solicitation

A brief summary of the research study was shared with the Vice Provost/Director of Extension and two Associate Vice Provosts of Extension to obtain permission prior to data collection. The survey questionnaire was developed and delivered via Qualtrics online. A survey invitation was sent to the professional work email account for MU Extension faculty and staff with an attached letter from the researcher. The email addresses for eligible MU Extension faculty and staff was obtained from MU Extension human resources.

Online Survey

An online survey was used to increase response rates and as a cost-effective measure. According to research by Greenlaw and Brown-Welty (2009), online surveys

produce higher response rates (52%) with lower costs when administered to an educated population with computer access. An online system, such as Qualtrics, also limits potential for errors in data entry from paper surveys (Greenlaw & Brown-Welty, 2009). An electronic response has benefits over a paper survey, as Greenlaw and Brown-Welty (2009) note, "Electronic reply eliminates the data input process, which further reduces the time element as well as decreases the potential for transcription errors" (p. 467).

The survey was sent out via email to faculty and staff in MU Extension. The email included the link to the online survey via Qualtrics and data were electronically collected from the respondents. All MU Extension faculty and staff have internet and computer access, so those were not barriers to participation. The survey was administered in January 2015 and was accessible for three weeks after the initial email communication. In research by Shih and Fan (2008), the response rate of web surveys averages around 34% and "a higher response rate implies less potential nonresponse bias" (p. 252). It was the hope of the researcher that the response rate will be at least 30% in order to best represent the population for the study. One follow-up email was sent halfway through the survey period and a second follow-up email was sent the day before the survey closed. Kittleson (1997) noted that a response rate of 25% to 30% can be expected with no follow-up reminder, but reminders can increase the response rate.

Instrumentation

The survey used for the research study had a total of 24 items plus 9 demographic questions. It combined 16 items from the Authentic Leadership Questionnaire developed by Walumbwa, et al. (2008), 6 questions on physical health behaviors from the

Behavioral Risk Factor Surveillance System (BRFSS), and 2 questions on health-related values. The beginning of the survey included a question to confirm the respondent was a .75 FTE faculty member within MU Extension. If they responded "no" to the question, the survey ended and did not proceed to the other questions. This was to ensure the correct population was completing the survey. Demographic information (years of employment, age, education level, sex, faculty vs. staff, area of work, race, ethnicity, and geographical area) was also collected in the survey. Demographic information was used as control variables to explain the research questions and underlying factors that may affect leadership or physical health.

The survey was sent out to a pilot group of ten participants chosen by the researcher as a way to test the survey before distribution to the population. This technique helped to establish reliability and validity of the survey instrument. The researcher made final corrections and instructions to the survey before it was emailed to the full population. Appendix C includes a sample of the survey questions.

Authentic Leadership Questionnaire (ALQ)

The 16 statements from the authentic leadership questionnaire (ALQ) included four statements for each of the following four areas of authentic leadership: self-awareness, internalized moral perspective, balanced processing, and relational transparency. Each question was measured on a Likert scale from 1-5. Each area of authentic leadership was scored based on the corresponding statements and then a score for authentic leadership was determined by totaling the scores for the four areas.

Permission was obtained by MindGarden, Inc. for use of the ALQ for this study. The permission form is included in Appendix D.

Some researchers have used the authentic leadership questionnaire (ALQ) as a way for followers to rate supervisors (Walumbwa et al., 2008) while other exploratory studies have researched self-perceptions of authentic leadership (Jensen & Luthans, 2006b). However, research by Jensen and Luthans (2006a) found a significant positive correlation for leaders' self-assessment of authentic leadership and that reported by their employees. For this study, self-perception and an intrapersonal perspective were used because the authentic leadership questionnaire can be used as a self-assessment and the physical activity questions are designed to be self-reported data.

Internal consistency reliability of the ALQ has already been determined by Walumba et al. (2008) by use of Cronbach's alpha. The internal consistency reliability for one sample was between .72 and .79, whereas a separate sample from the same study was between .81 and .92 (Walumbwa, et al., 2008). Another sample from the same study yielded an internal consistency reliability of .88 for the combined scale as a single factor (Walumbwa et al., 2008). For the authentic leadership questionnaire, Walumbwa et al. (2008) found initial evidence of construct validity from the measures used on the questionnaire.

Authentic leadership constructs. The 16 authentic leadership questions were each measured on a Likert scale from 1-5. The scores (1-5 for each statement) that corresponded to each component of authentic leadership (self-awareness, internalized moral perspective, balanced processing, and relational transparency) were totaled. The

score from each of the 16 items were then tallied into one total overall authentic

leadership score. This resulted in a single score for each component of authentic

leadership and one single score to represent overall authentic leadership. The scores for

authentic leadership (the total score) used the following guidelines: very high = 64-80,

high = 48-64, low = 32-48, and very low = 16-32. Research done by Walumbwa et al.

(2008) used the one-factor model of all 16 items and the breakdown of these scores is

noted in Northouse (2010).

Behavioral Risk Factor Survaillance System (BRFSS)

The BRFSS is administered by the Centers for Disease Control (CDC) and

became a national surveillance system in 1993. "The BRFSS is the nation's premier

system of health-related telephone surveys that collect state data about U.S. residents

regarding their health-related risk behaviors, chronic health conditions, and use of

preventive services" (Behavioral Risk Factor Surveillance System, 2013, para. 1). There

were six questions total to measure physical activity, smoking, and fruit and vegetable

consumption based on the questions from the BRFSS.

Questions from the BRFSS serve as the basis for this research survey, but the

questions for this research survey differed. The questions in this research survey related

to the way health behavior information is reported in national statistics and

recommendations. The health behavior questions on cigarette smoking included two

questions to establish a long-term and overall pattern of cigarette smoking behavior.

There were two questions to measure fruit and vegetable intake (in cups) over the past 30

days. The fruit and vegetable questions related to the current fruit and vegetables

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recommendations. There were two questions to measure physical activity habits over the past 30 days, including aerobic physical activity and muscle strengthening activity. The answers to those two questions were used to determine the current classification of physical activity habits (inactive, insufficiently active, and active) (Centers for Disease Control, 2014b). The responses from the two physical activity questions were transformed into two new variables, one with three categories (inactive, insufficiently active, and active) and one with two categories (active and inactive).

Respondents who did not meet either the muscle strengthening or aerobic physical activity recommendations from the 2008 Physical Activity guidelines were considered inactive. If the respondent met one, but not both of the physical activity recommendations, they were considered insufficiently active. Active respondents were those who met both the muscle strengthening and aerobic physical activity recommendations from the 2008 Physical Activity guidelines. The responses to the two physical activity questions also helped further categorize participants into two groups: (a) "active" = those who met the 2008 Physical Activity Guidelines for both muscle strengthening and aerobic physical activity and (b) "inactive" = those who did not meet the 2008 Physical Activity Guidelines for both muscle strengthening and aerobic physical activity.

Pierannunzi, Hu, and Balluz (2013) assessed the reliability for some questions of the BRFSS. For the physical activity questions, reliability is high based on test-retest and time trend measures. Nelson, Holtzman, Bolen, Stanwyck, and Mack (2001) found moderate reliability for physical activity questions and fruit/vegetable consumption

questions and high reliability for the smoking questions when compared to other self-reported measures.

Pierannunzi et al. (2013) found high validity for the physical activity questions and moderate validity for the tobacco questions from the BRFSS when compared with other surveys and physical measures. Nelson et al. (2001) found high validity for self-reported smoking habits and moderate validity for fruit/vegetable consumption. The physical activity questions from the BRFSS have not been tested for validity, but other research on physical activity questions suggested moderate validity for similar questions (Nelson et al., 2001).

Physical activity constructs. Physical activity was measured using two questions, one for muscle strengthening physical activity and one for aerobic physical activity. Those two questions were used to classify overall physical activity habits when compared to the current recommendations from the 2008 Physical Activity guidelines. The categories determined from the two physical activity questions are: inactive (little to no physical activity); insufficiently active (less than 150 minutes of aerobic physical activity per week and/or less than two muscle strengthening sessions per week); or active (at least 150 minutes of aerobic physical activity AND at least two muscle strengthening sessions per week). The questions were:

- "In the past 30 days, how many sessions per week of muscle strengthening physical activities did you participate in (on average)? (muscle strengthening activities include weight training, push-ups, etc.) and

- "In the past 30 days, how many minutes per week of aerobic physical activities did you participate in (on average)? (includes walking, jogging, aerobic classes, biking, hiking, swimming)"

Both fruit and vegetable consumption and physical activity habits can vary day-to-day, so an average over the last 30 days gave a clear picture as to the respondents' overall lifestyle physical health habits. The past month is common among food frequency and dietary recall assessments, but no current research has determined an ideal timeframe for recalling health behaviors (Behavioral Risk Factor Surveillance System, 2014).

Cigarette smoking constructs. The cigarette smoking questions gave an overall picture of the long-term cigarette smoking habits. The first question established overall smoking habits by asking, "How would you characterize your smoking habits?" with possible responses: daily smoker; occasionally or smoke in social situations but not daily; or non-smoker. The second question was based on the answer to that question. For daily smokers, the second question asked if they have tried to stop smoking in the past year. For occasional smokers or those who smoked in social situations, the second question measured the frequency of smoking as an average of cigarettes smoked per day over the last 30 days. For non-smokers, the second question asked how long since the respondent last smoked.

The first question for all participants read, "How would you characterize your smoking habits?" (daily smoker, occasionally or smoke in social situations but not daily, or non-smoker). If "daily smoker" was selected, the next question read, "During the past 12 months, have you stopped smoking for one day or longer because you were trying to

quit smoking?" (yes or no). If "occasionally or smoke in social situations but not daily" was selected, the next question read, "In the past 30 days, how many days did you have a cigarette?" for a continuous variable related to frequency of smoking. If "non-smoker" was selected in the first question, the next question read, "How long has it been since you last smoked a cigarette, even one or two puffs?" (past month, past three months, past six months, past year, past five years, past ten years, more than ten years, have never smoked). For the data analysis, the responses to the first smoking question was transformed into a categorical variable with two options: smoker (either daily or occasional) or non-smoker.

Fruit and vegetable constructs. Fruits and vegetables were represented by two separate continuous variables, one for fruit consumption (in cups) and one for vegetable consumption (in cups). Respondents were asked for an average amount consumed daily, over the past 30 days. The current fruit and vegetable recommendations are measured in cups, which will allow for comparison to the current nutrition guidelines from the USDA. The questions were:

- "In the past 30 days, how many cups of fruits did you eat daily (on average)?" (One cup of fruit also equals 1 small apple, 1 large banana or orange, 1 medium grapefruit, 8 large strawberries, 1 large peach, 1 medium pear, 32 grapes, 1/2 cup of dried fruit, or 1 cup of 100% fruit juice) and

- "In the past 30 days, how many cups of vegetables did you eat daily (on average)?" (One cup of vegetables also equals 2 cups of raw leafy vegetables (spinach, romaine), 2 cups of raw lettuce, 1 cup of cooked leafy vegetables, 1 cup

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of vegetable juice, 1 large ear of corn, 1 medium boiled or baked potato, or 12

baby carrots)

Health Values

Rokeach's (1967) terminal values survey is a frequently used assessment of health

as a value (Lau et al., 1986). Rokeach's (1967) terminal values survey and the four-item

Likert scale on health values developed by Lau et al. (1986) were used in this survey.

Smith and Wallston (1992) noted that the scale developed by Lau et al. (1986) is limited

because it only measures health value. Combining that scale with Rokeach's (1967)

terminal values survey strengthened the measurement of health as a value because it

measured values other than just health. The ranking procedure in Rokeach's (1967)

terminal values survey was useful because the survey dealt with how the value of health

in relation to other values predicts health behaviors (Smith & Wallston, 1992).

Health value constructs. The questions used to measure health as a value are

based on the Rokeach (1967) terminal values survey and the four-item health value scale

developed by Lau et al. (1986). The four-item health value questions were each

measured on a Likert scale from 1-5. The four questions were:

- "If you don't have your health, you don't have anything."

- "There are many things I care about more than my health."

- "Good health is only of minor importance in a happy life."

- "There is nothing more important than good health."

The second health as a value question reads, "What is it you most want out of

life?" and uses Rokeach's (1967) terminal values survey which includes 18 items

(including health) that are ranked from 1 (most) to 18 (least). A list of Rokeach's (1967) terminal values is included in Appendix E. In the data analysis, only the health-value ranking from Rokeach's (1967) terminal values survey was used.

Data Analysis Procedures

This study included questions to measure the variables related to authentic leadership, physical activity, smoking, fruit and vegetable consumption, as well as demographic variables. The authentic leadership components (self-awareness, internalized moral perspective, balanced processing, and relational transparency) and the overall authentic leadership score were the independent continuous variables and were determined from the authentic leadership questionnaire. Physical activity, smoking, and fruit and vegetable consumption were the dependent variables. The smoking questions were categorical, the physical activity questions yielded continuous variables (those continuous variables were also transformed into new categorical variables), and the fruit/vegetables questions yielded continuous variables.

Demographic information such as years of employment, age, education level, sex, faculty vs. staff, area of work, race, ethnicity, and geographical area were used as control variables. One question on gender asked: "What is your gender?" with possible responses: (a) male; (b) female; and (c) transgender. The specific responses were indicative of sex, which resulted in the variable name of sex. Regression analysis was used to control for these other variables and correlation was used to determine the relationship between the variables. The demographic information helped determine if some of the relationships between authentic leadership and the three physical health

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behaviors could be attributed to other factors. For example, if an individual has many years of professional experience, they may score higher in authentic leadership characteristics than someone who has little experience.

The responses from Qualtrics were exported to SPSS. Data were analyzed using SPSS. A histogram of the variables was used to visually determine if the data were normally distributed. A K-S test was also used to determine if the data were significantly different than a normal distribution. Bivariate correlations were used because they were correlations between two variables (Field, 2009). If the data would have been normally distributed, the Pearson's correlation coefficient would be used to determine the bivariate correlation between authentic leadership and each of the three health behavior variables (cigarette smoking, physical activity, and fruit and vegetable consumption). However, the data were not normally distributed, so Spearman's correlation coefficients were used. Spearman's correlation coefficients are a non-parametric statistic used when the data are not normally distributed (Field, 2009). The probability values (p values) were set at .05, .01, and .001. Regression analyses were used to better explain the relationship between authentic leadership, physical health behaviors, and control variables after the correlations were determined. The means and standard deviation of the demographical information were also analyzed to describe the population of the research study.

Summary

This purpose of this correlational post-positivist study was to examine the relationship between authentic leadership characteristics and health behaviors of MU Extension faculty and staff. A cross-sectional survey was used to collect information

about authentic leadership from an intrapersonal perspective, self-reported health

behaviors, health values, and demographic information. The research purpose, research

questions, research design, population and participants, data collection procedures,

instrumentation, and data analysis procedures were covered. Chapter 4 focuses on the

results of the data analysis.

CHAPTER 4: RESULTS

The purpose of this study was to examine the relationship between authentic leadership characteristics and physical health behaviors of MU Extension faculty and staff. The data were collected from MU Extension faculty and staff via an online survey that was open for three weeks. The guiding research query for this study was: Is there a relationship between authentic leadership characteristics and health behaviors (specifically physical activity, smoking, and fruit and vegetable consumption)? The guiding query was then broken down into three research questions:

1. Is there a relationship between authentic leadership characteristics and physical activity?

2. Is there a relationship between authentic leadership characteristics and smoking?

3. Is there a relationship between authentic leadership characteristics and fruit and vegetable consumption?

This chapter provides the findings related to investigation of these research questions. In the following section, descriptive statistics of the sample are provided including the demographics of the sample, the dependent variables, and the independent variables. Following the descriptive statistics, statistical analyses are presented to answer the research questions. Finally, the chapter concludes with a brief summary of the results.

Descriptive Statistics

The descriptive statistics provide an understanding of the sample and the key variables. These descriptive statistics help summarize the sample and describe what the data indicated about the survey respondents and responses. The descriptive statistics allowed a comparison of the demographics of the total population of MU Extension faculty and staff and the sample that completed the survey. This section also describes a summary of the responses to the dependent and independent variable. This section includes demographics of the sample, the dependent variables, the independent variables, and control variables.

Demographics of the Sample

The total population of MU Extension faculty and staff was 747 people (at the time of the survey) and 100% of the population was invited to participate via email solicitation. Two hundred sixty-one participants filled out the online survey, yielding a 35% response rate. However, not all respondents answered all questions, thus the analytic samples for each question vary. Almost 75% of the sample was female, over 88% of the sample were white, just over 58% were faculty, and 71% were located in regional offices.

Table 1 provides an overview of selected demographics of the entire population of MU Extension faculty and staff (D. Dews, personal communication, January 22, 2015) compared to the participants from the study. The variables used for comparison were sex, job category (faculty vs. staff), and participant location (campus vs. regional).

Table 1

Demographics: Sex, Job Category, Location

Demographics		Population	Percent	Sample	Percent
Sex	Male	233	31.2%	63	25.3%
	Female	514	68.8%	186	74.7%
Job Category	Faculty	341	45.6%	145	58.5%
	Staff	406	54.4%	101	40.7%
Location	Campus	295	39.5%	70	29.5%
	Regional	452	60.5%	167	70.5%

Females participated at a higher rate than their male counterparts. Specifically, 75% of the sample was female, while only 69% of the MU Extension population was female. Faculty also participated at a higher rate than staff. Specifically, 59% of the sample was faculty, while only 46% of the MU Extension population was faculty. Also, responses from regional faculty and staff were higher than responses from campus faculty and staff. Just over 70% of the sample were regional faculty and staff, compared to just over 60% of the MU Extension population.

Table 2 provides an overview of the race and ethnicity demographics of the sample. The sample was over 88% White, with other races represented in small amounts. In 2014, the total MU Extension population was 88% White (D. Dews, personal communication, March 19, 2015). Over 97% of the sample was non-Hispanic/Latino, with just under 3% Hispanic/Latino. In 2014, the total MU Extension population was

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97% non-Hispanic/Latino and 3% Hispanic/Latino (D. Dews, personal communication, March 19, 2015). Thus, the sample appears to be fairly representative based upon race and ethnicity data.

Table 2

Demographics: Race and Ethnicity

Demographics		Number	Percent
Race	American Indian or Alaskan Native	2	0.8%
	Asian	3	1.2%
	Black or African American	8	3.2%
	White	223	88.8%
	Two or More Races	8	3.2%
	Other Race	1	0.4%
	Undisclosed	6	2.4%
Ethnicity	Hispanic	7	2.8%
	Non-Hispanic	242	97.2%

Table 3 provides an overview of the age and years of MU Extension professional experience of the respondents. Ages 41 to 60 represented over half of the respondents, with all age ranges represented. Over 30% of the respondents had been employed by MU Extension for less than five years. Another 33% of the respondents had been employed

between 5 and 20 years. Comparable MU Extension population data were not available for these variables.

Table 3

Demographics: Age and Years of Employment

Demographics		Number	Percent
Age	20 to 30 years	24	9.6%
	31 to 40 years	45	17.9%
	41 to 50 years	54	21.5%
	51 to 60 years	87	34.7%
	61 to 70 years	39	15.5%
	71 and up	2	0.8%
Years of Employment	Less than 5 years	78	31.1%
	5 to 10 years	46	18.3%
	11 to 20 years	62	24.7%
	21 to 30 years	35	13.9%
	31 years or more	30	12.0%

Table 4 provides an overview of the program area of the MU Extension population and the sample population. Human Environmental Sciences (HES) represented 36% of the respondents, while administration, agriculture, and youth development all represented around 15% of the sample population. In 2014, 35% of the

total MU Extension population was in Human Environmental Sciences (HES), while administration represented 8%, agriculture represented 19%, and youth development represented 15%. (D. Dews, personal communication, March 19, 2015).

Table 4

Demographics: Program Area of the MU Extension population and sample

Demographics		Population	Percent	Sample	Percent
Program Area	Administration	79	11%	36	14.5%
	Agriculture	136	18.9%	36	14.5%
	Business Development	51	7%	8	3.2%
	Community Development	22	3%	16	6.5%
	Continuing Education	56	7.8%	11	4.4%
	HES	252	35%	90	36.3%
	Youth Development	109	15.2%	38	15.3%
	Other	14	1.9%	13	5.2%

Table 5 provides an overview of the highest education level of the sample. Over 55% of the respondents had a master's degree (which is the minimum degree required for faculty), 13% had a doctoral degree, 18% had a bachelor's degree, and just over 10% had an associate's degree or equivalent. Comparable MU Extension population data were not available for this variable.

Table 5

Demographics: Highest Education Level

Demographics		Number	Percent
Highest Education	Associates Degree (or equivalent)	26	10.6%
	Bachelor's Degree	45	18.4%
	Master's Degree	136	55.5%
	Doctoral Degree (PhD or EdD)	32	13.1%
	JD	1	0.4%
	Other	5	2.0%

Dependent Variables

The dependent variables included cigarette smoking, muscle strengthening physical activity, aerobic physical activity, fruit consumption, and vegetable consumption. Table 6 presents the mean, standard deviation, minimum, median, and maximum for the dependent variables (cigarette smoking, muscle strengthening physical activity, aerobic physical activity, fruits, and vegetables). Cigarette smoking was a categorical variable, so a dummy variable was created for the descriptive statistics. The values for non-smokers was 0, while the value for smokers was 1.

Table 6

Dependent Variables: Cigarette smoking, muscle strengthening physical activity, aerobic physical activity, fruits, and vegetables

Variable	Mean	SD	Min	Median	Max
Cigarette smoking (0 non-smoker; 1 for smoker)	0.04	0.20	0	0.00	1
Muscle strengthening physical activity (average sessions per week)	1.27	1.69	0	0.00	7
Aerobic physical activity (average minutes per week)	129.17	180.57	0	80	1,000
Fruits (average daily cups consumed)	1.97	1.37	0	2	10
Vegetables (average daily cups consumed)	2.28	1.48	0	2	10

Cigarette smoking. The main survey question on cigarette smoking read, "How would you characterize your smoking habits?" Depending on the response, one other question was asked to give an overall picture for cigarette smoking habits. For this variable, 4% were daily smokers, 3% were occasional smokers or smoked in social situations (but not daily), and 93% were non-smokers. For the data analysis, the two categories of daily smokers and occasional smokers were combined into one category (smoker) to compare to the non-smokers. To compare the two groups, 93% were non-

smokers and 7% were smokers (including daily smokers and occasional smokers). The

national average hovers around 20% smokers (National Center for Health Statistics,

2011a). However, that percentage drops to 9% in adults with an undergraduate college

degree (Centers for Disease Control, 2014).

      Muscle strengthening physical activity. The survey question on muscle

strengthening physical activity read, "In the past 30 days, how many sessions per week of

muscle strengthening physical activities did you participate in (on average)?" Muscle

strengthening physical activities was measured by sessions per week. Values above 7

were removed (21 total were removed) as this is the maximal days per week and the

range was 0 to 7 sessions per week.

      The mean for muscle strengthening physical activity was 1.27 sessions per week

(SD = 1.69). The median was 0 and 53% of respondents participated in no muscle

strengthening physical activity. Muscle strengthening physical activity was non-normally

distributed, with skewness of 1.23 ($SE = 0.16$), p <.001. The Kolmogorov-Smirnov (K-

S) test compared whether the distribution of the scores from this study deviated from a

normal distributed set of scores and this test indicated that the data from this study was

significantly different from a normal distribution. Muscle strengthening physical activity,

$D(190) = 0.30$, $p < .001$, was significantly non-normal.

      The 2008 Physical Activity guidelines recommendation is two sessions of muscle

strengthening sessions per week (United States Department of Health and Human

Services, 2008). When compared to the current recommendations, 67% of the

respondents did not meet the 2008 Physical Activity Guidelines recommendation for

muscle strengthening physical activity. In the sample, 33% of the respondents met the 2008 Physical Activity Guidelines recommendation for muscle strengthening physical activity. The histogram for muscle strengthening physical activity is presented in Figure 1.
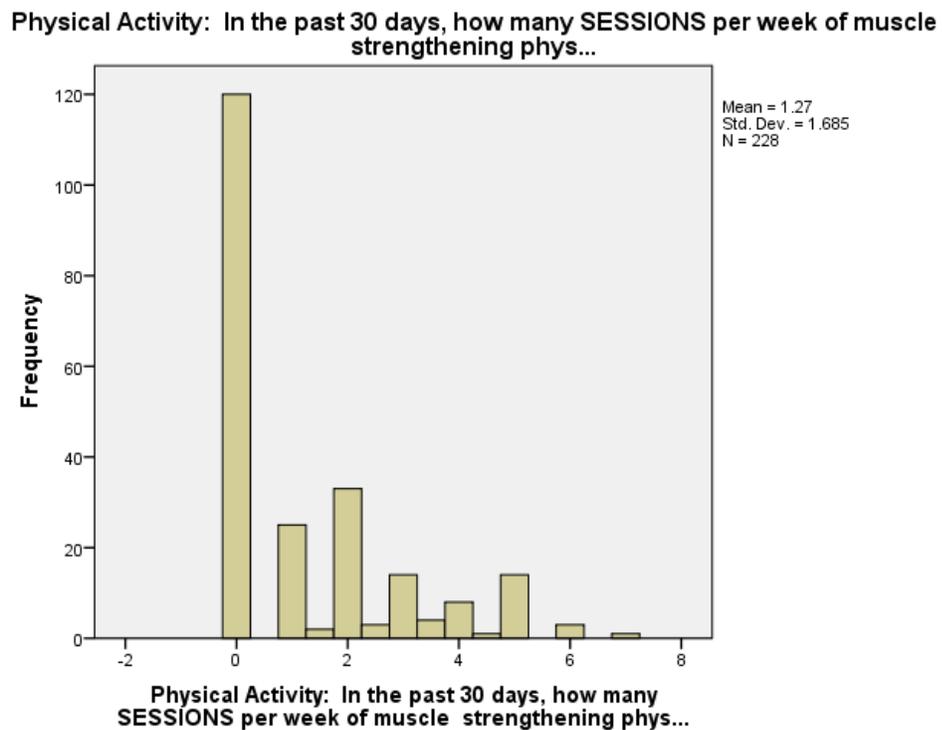
Figure 1. Histogram of muscle strengthening physical activity

Aerobic physical activity. The survey question on aerobic physical activity read, "In the past 30 days, how many minutes per week of aerobic physical activities did you participate in (on average)?" Aerobic physical activity was measured in minutes per week. Two values that were above 1,000 minutes per week were removed because that

would equal an average of 142 minutes (just less than 2.5 hours) daily, which is difficult to accomplish and maintain. The scores ranged from 0 to 1,000 minutes weekly.

The mean for aerobic physical activity was 129.17 minutes per week (SD = 180.57). The median was 80 minutes per week. In the sample, 14% participated in no aerobic physical activity. Aerobic physical activity was non-normally distributed, with skewness of 2.70 ($SE = 0.15$), p <.001. The Kolmogorov-Smirnov (K-S) test compared whether the distribution of the scores from this study deviated from a normal distributed set of scores and the test indicated that the data from this study was significantly different from a normal distribution. Aerobic physical activity, D(190) = 0.24, p < .001, was significantly non-normal.

The 2008 Physical Activity guidelines recommendations are 150 minutes of moderate aerobic physical activity per week (United States Department of Health and Human Services, 2008). When compared to the current recommendations, 69% of the respondents did not meet the 2008 Physical Activity guidelines recommendation for aerobic physical activity (150 minutes per week). In the sample, 31% met the 2008 Physical Activity Guidelines recommendation for aerobic physical activity. The histogram for aerobic physical activity is presented in Figure 2.

Physical Activity: In the past 30 days, how many MINUTES per week of aerobic physical activiti...
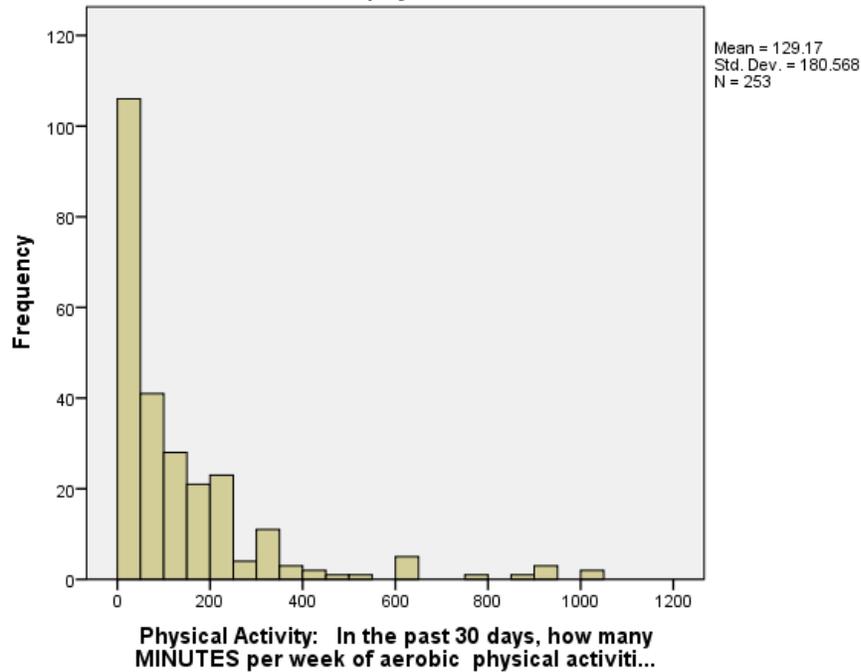
Figure 2. Histogram of aerobic physical activity

Overall physical activity. The respondents were also separated into three categories for a snapshot of their overall physical activity level using both physical activity variables: muscle strengthening physical activity and aerobic physical activity. Respondents who did meet either of the 2008 Physical Activity Guidelines recommendations were categorized as inactive. Respondents who met one recommendation (either muscle strengthening or aerobic), but not both, were categorized as insufficiently active. The respondents who met both (muscle strengthening and aerobic) were categorized as active. Within these categories, 53% were inactive, 36%

were insufficiently active, and 11% were active. Table 7 presents the breakdown within

the three categories

Table 7

Overall physical activity categories

Category	Number	Percent
Inactive	135	52.5%
Insufficiently Active	93	36.2%
Active	29	11.3%

Fruit and vegetable consumption. The survey question on fruit read, "In the

past 30 days, how many cups of fruits did you eat daily on average?" Fruit consumption

was measured in cups daily. Any values over 10 cups per day were removed because that

would be difficult to accomplish. The scores ranged from 0 to 10 cups daily. The mean

for fruit consumption was 1.97 cups (SD = 1.37). The median for fruit consumption was

2 cups. Fruit consumption was non-normally distributed, with skewness of 2.40 (*SE* =

0.16), p <.001. The Kolmogorov-Smirnov (K-S) test compared whether the distribution

of the scores from this study deviated from a normal distributed set of scores and the test

indicated that the data from this study was significantly different from a normal

distribution. Fruit consumption, $D(190) = 0.21$, $p < .001$, was significantly non-normal.

Figure 3 is the histogram for fruit consumption.
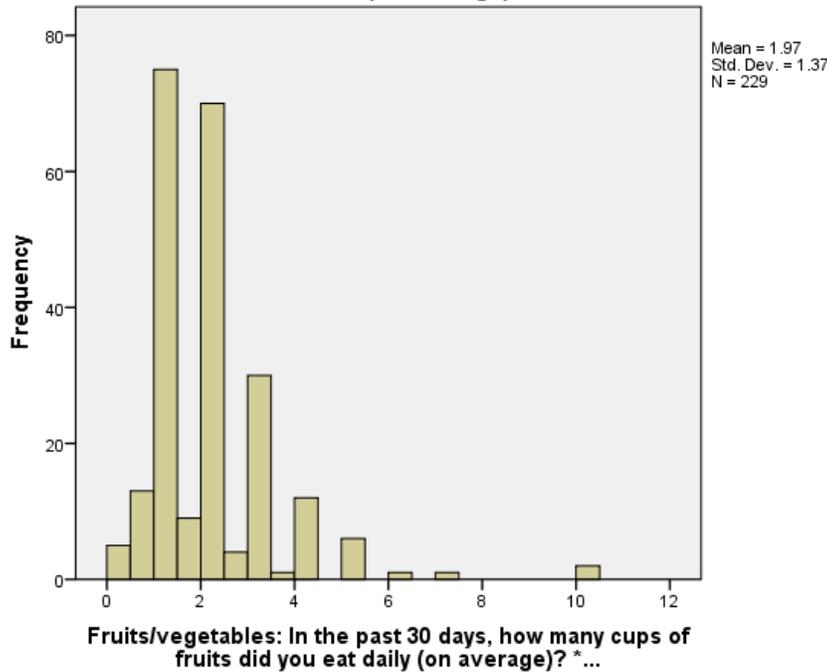
Figure 3. Histogram of fruit consumption.

The survey question for vegetable consumption read, "In the past 30 days, how many cups of vegetables did you eat daily on average?" Vegetable consumption was measured in cups daily and any values over 10 cups per day were removed because that would be difficult to accomplish. The mean for vegetable consumption was 2.28 cups (SD = 1.48). The median for vegetable consumption was 2 cups. Vegetable consumption was non-normally distributed, with skewness of 2.72 (SE = 0.16), p <.001. The Kolmogorov-Smirnov (K-S) test compared whether the distribution of the scores from this study deviated from a normal distributed set of scores and the test indicated that the data from this study was significantly different from a normal distribution. Vegetable

consumption, $D(190) = 0.26$, $p < .001$, was significantly non-normal. Figure 4 is the

histogram for vegetable consumption.
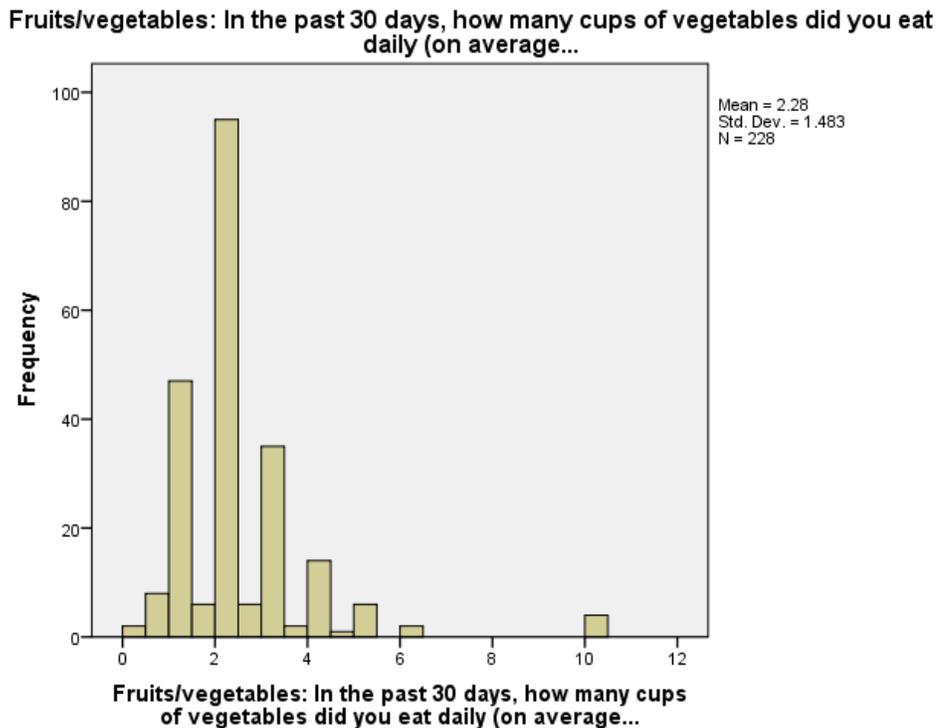
Figure 4. Histogram of vegetable consumption.

Independent Variables

Authentic leadership was the primary independent variable. An overall score for

authentic leadership, as well as four components of authentic leadership, were calculated

from the responses from the Authentic Leadership Questionnaire (ALQ) (Walumbwa et

al., 2008). Sixteen statements were included in the survey, with the four components of

authentic leadership each represented by four questions. Those four components include:

self-awareness, internalized moral perspective, balanced processing, and relational

transparency. Each statement was scored using a five-point Likert-scale and scores for each question were represented by: 1. strongly disagree; 2. disagree; 3. neutral; 4. agree; 5. strongly agree. The sum from all four components (or all 16 statements) was used to represent an overall authentic leadership score. An overview of the mean, standard deviation, minimum, median, and maximum of the four components of authentic leadership and the overall authentic leadership score are listed in Table 8.

Table 8

Independent Variables: Authentic Leadership Components and Overall Authentic Leadership Score

Component	Mean	SD	Min	Median	Max
Overall Authentic Leadership	62.31	5.86	32	62	76
Self-Awareness	15.82	1.79	9	16	20
Internalized Moral Perspective	15.97	1.91	8	16	20
Balanced Processing	15.23	1.90	6	15	20
Relational Transparency	15.27	2.13	9	15	20

Overall authentic leadership score. The overall authentic leadership score from the ALQ was designed to measure the four components (self-awareness, internalized moral perspective, balanced processing, and relational transparency) that constitute authentic leadership into one score. The mean for the overall authentic leadership score was 62.31 (SD = 5.86) and the median was 62. The range for the overall authentic

leadership score was from 32 to 76. The overall authentic leadership score was non-normally distributed, with skewness of -0.50 (*SE* = .15), p < .001. The Kolmogorov-Smirnov (K-S) test compared whether the distribution of the scores from this study deviated from a normal distributed set of scores and the test indicated that the data from this study was significantly different from a normal distribution. The overall authentic leadership score, $D(254) = 0.07$, p < .01, was significantly non-normal. The histogram for the overall authentic leadership score is presented in Figure 5.
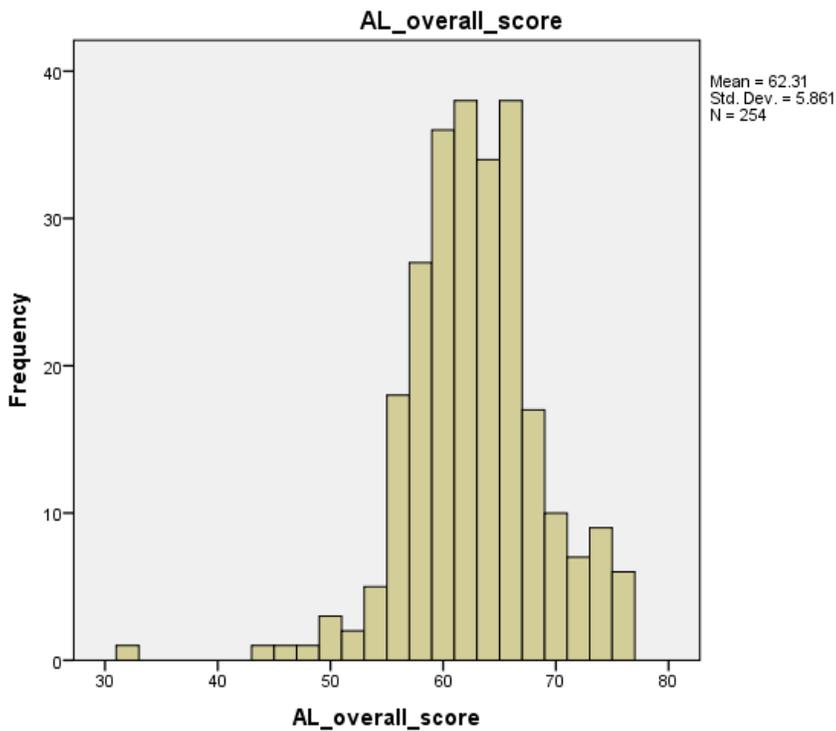
Figure 5. Histogram of authentic leadership overall score.

Self-awareness. Self-awareness measured how well one knows and understands themselves, which includes personal strengths and weaknesses. The mean for the self-

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awareness component was 15.82 (SD = 1.79) and the median was 16. The range of

scores for this component was from 9 to 20. According to one test, the self-awareness

component was normally distributed, with skewness of -0.20 (*SE* = .15), which was not

significant. However, the Kolmogorov-Smirnov (K-S) test and a visual inspection of the

histogram were also used to determine if the self-awareness component was normally

distributed. The Kolmogorov-Smirnov (K-S) test compared whether the distribution of

the scores from this study deviated from a normal distributed set of scores and the test

indicated that the data from this study was significantly different from a normal

distribution. The self-awareness component, D(254) = 0.16, p < .001, was significantly

non-normal. The histogram for the self-awareness component is presented in Figure 6.
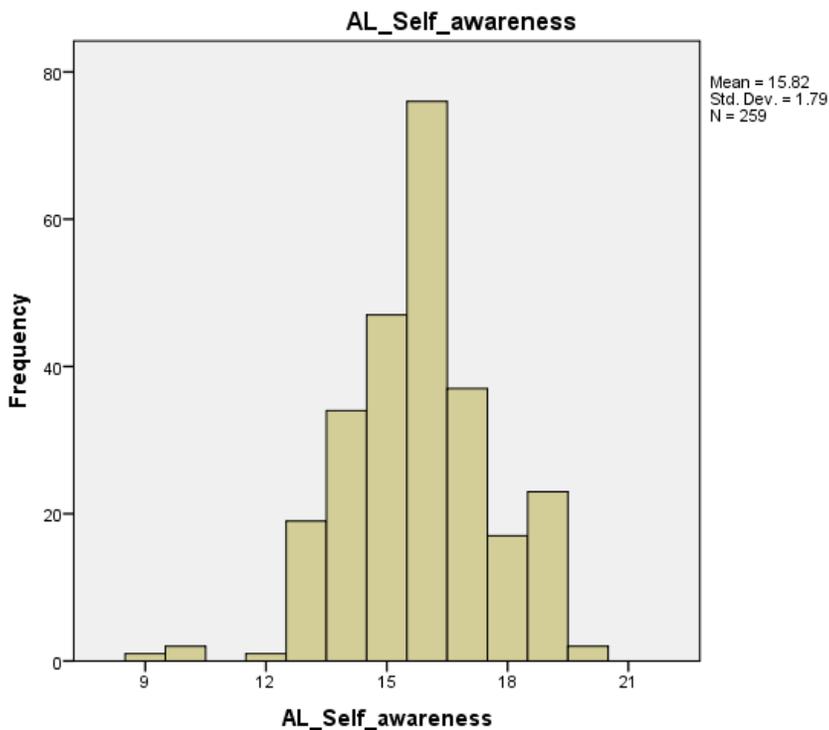
Figure 6. Histogram of self-awareness component.

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Internalized moral perspective. Internalized moral perspective is basing actions on values and living by morals and beliefs. The mean for the internalized moral perspective component was 15.97 (SD = 1.91) and the median was 16. The range of scores for this component was from 8 to 20. The internalized moral perspective component was not normally distributed, with skewness of -0.51 (SE = .15), p < .001. The Kolmogorov-Smirnov (K-S) test compared whether the distribution of the scores from this study deviated from a normal distributed set of scores and the test indicated that the data from this study was significantly different from a normal distribution. The internalized moral perspective component, D(254) = 0.12, p < .001, was significantly non-normal. The histogram for the internalized moral perspective component is presented in Figure 7.
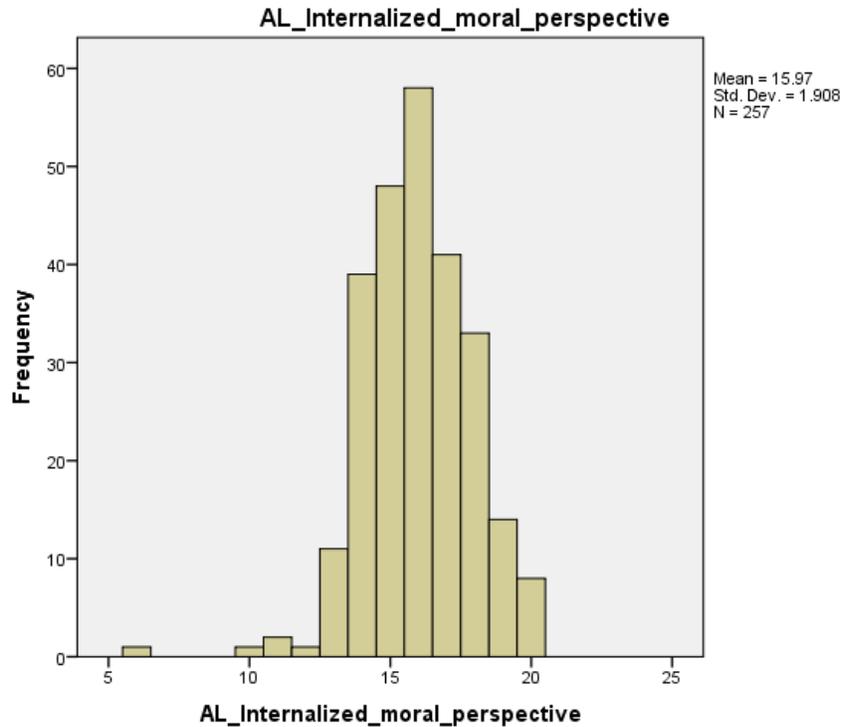
Figure 7. Histogram of internalized moral perspective component.

Balanced processing. Balanced processing is listening to and considering the ideas of other before making a decision. The mean for the balanced processing component was 15.23 (SD = 1.90) and the median was 15. The range of scores for this component was from 6 to 20. According to one test, the balanced processing component was normally distributed, with skewness of -0.24 (SE = .15), which was not significant. However, the Kolmogorov-Smirnov (K-S) test and a visual inspection of the histogram were also used to determine if the balanced processing component was normally distributed. The Kolmogorov-Smirnov (K-S) test compared whether the distribution of the scores from this study deviated from a normal distributed set of scores and the test indicated that the data from this study was significantly different from a normal

distribution. The balanced processing component, D(254) = 0.14, p < .001, was

significantly non-normal. The histogram for the balanced processing component is

presented in Figure 8.
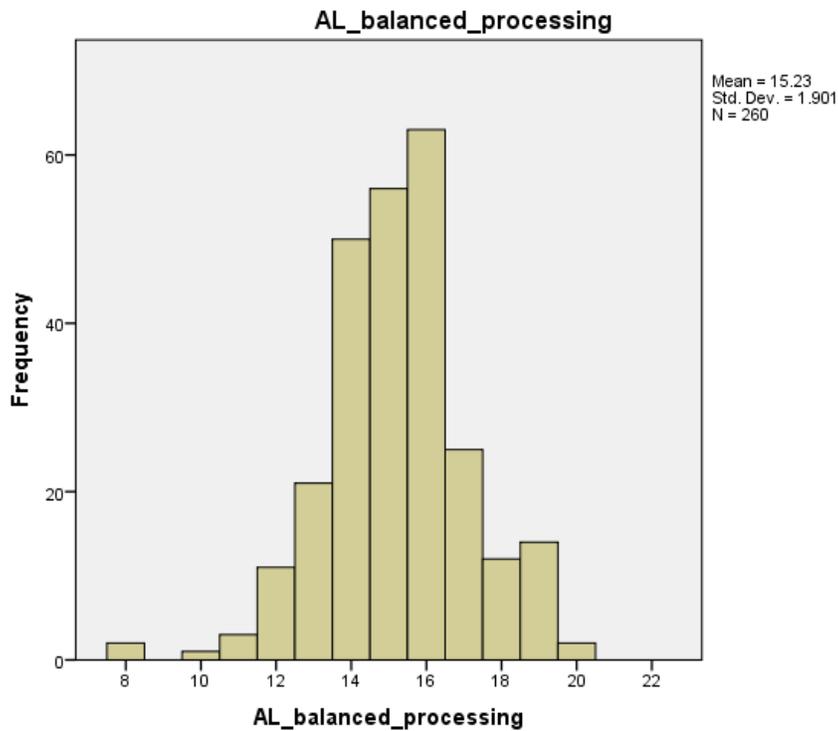
Figure 8. Histogram of balanced processing component.

Relational transparency. Relational transparency is openly sharing feelings,

being who you truly are, and not presenting a false front. The mean for the relational

transparency component was 15.27 (SD = 2.13) and the median was 15. The range of

scores for this component was from 9 to 20. According to one test, the relational

transparency component was normally distributed, with skewness of -0.24 (*SE* = .15),

which was not significant. However, the Kolmogorov-Smirnov (K-S) test and a visual

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inspection of the histogram were also used to determine if the relational transparency component was normally distributed. The Kolmogorov-Smirnov (K-S) test compared whether the distribution of the scores from this study deviated from a normal distributed set of scores and the test indicated that the data from this study was significantly different from a normal distribution. The relational transparency component, $D(254) = 0.13$, $p <$ .001, was significantly non-normal. The histogram for the relational transparency component is presented in Figure 9.
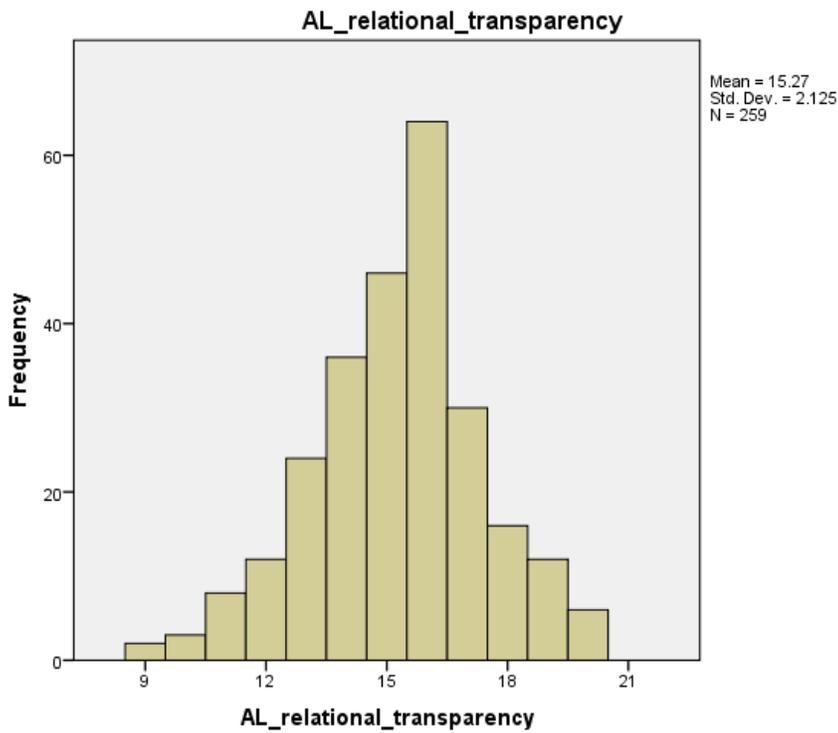

Figure 9. Histogram of relational transparency component.

Control Variables

The control variables for the data analysis include age, education level, sex, race, and the health value terminal ranking. The age and race control variables were transformed slightly from the above demographic information as described in the next paragraph. Health value was measured by the ranking order question using Rokeach's (1967) terminal values.

Age, education level, sex, and race. The control variable for age was a categorical variable with five categories: (a) 20 to 30 years old; (b) 31 to 40 years old; (c) 41 to 50 years old; (d) 51 to 60 years old; and (e) 61 and up. Two age categories (61 to 70, 70 and up) were combined into one category of 61 and up. Education level was a categorical variable with four categories: (a) associate's degree or equivalent; (b) bachelor's degree; (c) master's degree; and (d) doctorate (EdD, PhD, JD). The control variable for sex was a categorical variable with two categories: male and female. The survey question was asked as "what is your gender?" with three possible responses: (a) male; (b) female; and (c) transgender. The actual responses were indicative of sex, so the variable was labeled as sex. The control variable for race was also a categorical variable with two categories: White and non-White. Males were coded as 0 and females were coded as 1 for the analyses. Whites were coded as 0 and non-whites (all other race categories) were coded as 1 for the analyses.

Terminal ranking of health value. The survey question for terminal ranking of health value read, "What is it you want most out of life?" Respondents were to rank 18 terminal values, one of which was health, from the most important (a value of 1) to the

least important (a value of 18). This variable was called terminal ranking of health value

and ranges from 1 to 18. The mean was 4.44 (SD = 3.05) and the median was 4. Within

the ranking, 16% ranked health as the most important value, 18% ranked health as the

second most important value, and 15% ranked health as the third most important value.

The histogram for the terminal ranking of health value is presented in Figure 10.
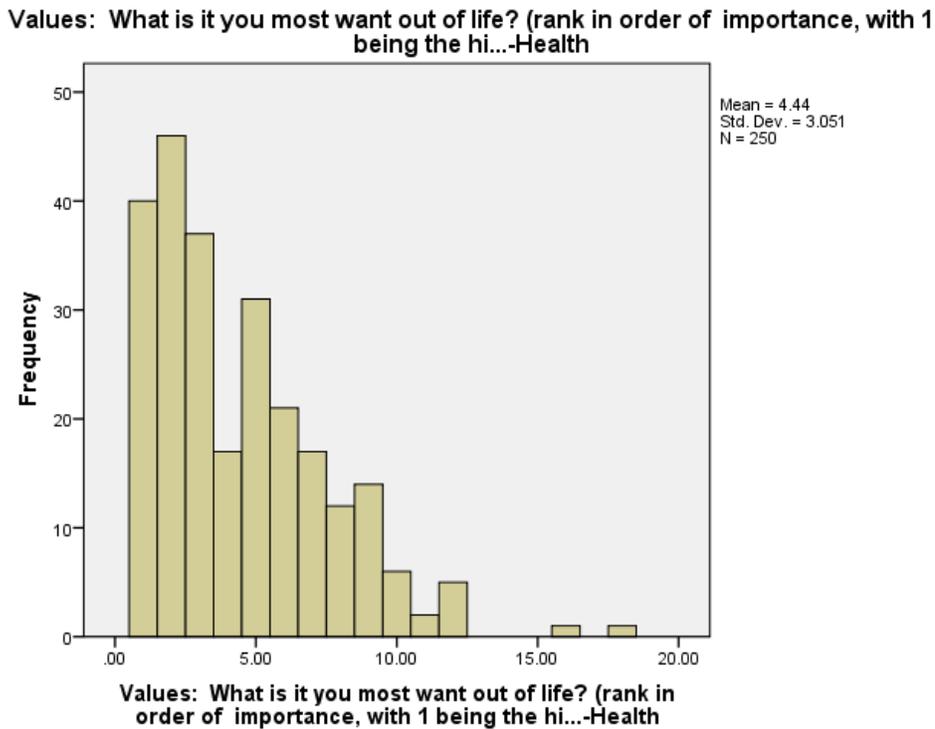
Figure 10. Histogram of terminal ranking of health value.

Quantitative Analysis

The quantitative data analysis is organized within each research question. First,

correlations coefficients are presented for the dependent variable with the overall

authentic leadership score and the four components of authentic leadership. Then, the

results from a regression analysis are presented for the dependent variable and the overall authentic leadership score with the control variables. Next, the results from a regression analysis are presented for the four authentic leadership components with the control variables. The four components of authentic leadership are analyzed separately in the correlation coefficients and together in the regression analyses. Regression analyses were done for the following: (a) dependent variable and overall authentic leadership score with controls (age, education level, sex, race, and health value ranking) and (b) dependent variable and four authentic leadership components with controls (age, education level, sex, race, and health value ranking). For the regression analyses, males were coded as 0 and females were coded as 1. Whites were coded as 0 and non-Whites (all other race categories) were coded as 1. The exact correlation and regression technique will vary depending on the actual dependent variable and is described in each section.

Research Question 1: Is there a relationship between authentic leadership characteristics and physical activity?

Authentic leadership was measured by the overall authentic leadership score and the four components, which were: self-awareness, internalized moral perspective, balanced processing, and relational transparency. Multiple outcomes for physical activity were analyzed. First, physical activity was measured by two separate variables – muscle strengthening physical activity and aerobic activity, which are both dependent variables. Next, muscle strengthening physical activity and aerobic activity were combined into an overall physical activity classification (inactive, insufficiently active, and active) and

categorized according to national recommendations. Finally, two categories of overall physical activity (active and inactive) were analyzed.

Muscle strengthening physical activity. The Kolmogorov-Smirnov (K-S) test was significant for muscle strengthening physical activity, which means the data were non-normal. Thus, for the quantitative analysis, Spearman's correlation coefficients were used. Spearman's correlation coefficients are utilized when the data are non-normally distributed because it is a "non-parametric statistic used when the data have parametric assumptions, such as non-normally distributed data" (Field, 2009, p. 179). Correlation was used to determine the relationship between two variables. Table 9 presents the Spearman's correlation coefficients for authentic leadership and muscle strengthening physical activity.

Table 9

Spearman's correlation coefficients: Authentic leadership (AL) and muscle strengthening physical activity

AL component	Muscle strengthening physical activity
Overall AL score	.08
Self-awareness	.15*
Internalized moral perspective	-.04
Balanced Processing	.07
Relational Transparency	.09

*Significant at $p < 0.5$ level.

There was a significant relationship between muscle strengthening physical activity and self-awareness, $r_s = .15$, p (one-tailed) $< .05$. This means that higher scores of the self-awareness component were associated with increased muscle strengthening physical activity. There were no significant relationships between any other components of authentic leadership and muscle strengthening physical activity. The relationship between the overall authentic leadership score and muscle strengthening physical activity was also not significant.

Table 10 presents the multiple regression results for muscle strengthening physical activity and the authentic leadership overall score with age, education level, sex, race, and health value as controls. This regression model with control variables predicted 9% of the variation in muscle strengthening physical activity. There was not a significant relationship between the overall authentic leadership score and muscle strengthening physical activity, when controlling for age, education level, sex, race, or health value. This means these variables in combination do not significantly predict muscle strengthening physical activity. The best and only predictor of muscle strengthening physical activity was age ($p < .001$). Age was a negative predictor, which means that as age decreased, muscle strengthening physical activity increased. Age accounted for 7% of the variation in muscle strengthening physical activity when analyzed with control variables. When compared to the correlation analysis, the authentic leadership overall score was not significant for both analyses.

Table 10

Multiple regression: Muscle strengthening physical activity and AL overall score with age, education level, sex, race, and health value controls

	B	SE B	B
Constant	1.25	1.64	
AL overall score	.03	.02	.11
Age	-.35	.10	-.27***
Education level	-.29	.15	-.14
Sex	-.21	.29	-.06
Race	.63	.42	.10
Health Value ranking	-.06	.04	-.11

*** Significant at p < .001 level.

Table 11 presents the regression results for muscle strengthening physical activity and the four authentic leadership components, when age, education level, sex, race, and health value are held constant. This regression model with control variables predicted 13% of the variation in muscle strengthening physical activity. Age (p < .01) and education level (p < .05) were the best predictors of muscle strengthening physical activity. This meant as age decreased and educational level decreased, muscle strengthening physical activity increased. When a stepwise regression model was used, age predicted 6% of the variation in muscle strengthening physical activity, age combined with the self-awareness component added 2%, which totaled 8% of the

variation in muscle strengthening physical activity, and age combined with self-awareness and education level added 2%, which totaled 10% of the variation in muscle strengthening physical activity. When compared to the correlation analyses, the authentic leadership components also had non-significant relationships with muscle strengthening physical activity.

Table 11

Multiple regression: Muscle strengthening physical activity and AL components with age, education level, sex, race, and health value controls

	B	SE B	B
Constant	1.58	1.71	
Self-awareness	.14	.08	.14
Internalized moral perspective	-.09	.09	-.09
Balanced processing	.00	.07	.00
Relational transparency	.07	.07	.09
Age	-.31	.10	-.22**
Education level	-.30	.15	-.15*
Sex	-.32	.30	-.08
Race	.58	.42	.09
Health value ranking	-.06	.04	-.10

** Significant at p < .01 level, * Significant at p < .05 level.

Aerobic physical activity. The Kolmogorov-Smirnov (K-S) test was significant for aerobic physical activity, which means the data were non-normal. Thus, for the quantitative analysis, Spearman's correlation coefficients were used. Spearman's correlation coefficients are utilized when the data are non-normally distributed because it is a non-parametric statistic used with non-normally distributed data (Field, 2009). Correlation was used to determine the relationship between two variables. Table 12 presents the Spearman's correlation coefficients for authentic leadership and aerobic physical activity.

Table 12

Spearman's correlation coefficients: Authentic leadership (AL) and aerobic physical activity

AL component	Aerobic physical activity
Overall AL score	.08
Self-awareness	-.00
Internalized moral perspective	.06
Balanced Processing	.09
Relational Transparency	.04

Regarding aerobic physical activity, there were no significant relationships between any of the components of authentic leadership or the overall authentic leadership score from the Spearman's correlation coefficients. This means there was not a

significant relationship between the overall authentic leadership score and aerobic

physical activity. There were also no significant relationships between any of the four

components of authentic leadership and aerobic physical activity.

Table 13 presents the regression results for aerobic physical activity and overall

AL score, when age, education level, sex, race, and health value are held constant. There

were no significant predictors for aerobic physical activity in this model. This means

these variables in combination do not significantly predict aerobic physical activity. This

regression model with the control variables predicted less than 1% of the variability.

When compared to the correlation analysis, the authentic leadership overall score was not

significant for both analyses.

Table 13

Multiple regression: Aerobic physical activity and overall AL score with age, education

level, sex, race, and health value controls

	B	SE B	β
Constant	148.62	168.90	
AL overall score	.437	2.20	.01
Age	1.23	10.81	.01
Education level	-7.84	15.73	-.04
Sex	-25.36	30.56	-.06
Race	27.88	44.66	.04
Health value ranking	-2.55	4.25	-.04

Table 14 presents the regression results for aerobic physical activity and the four authentic leadership components, when age, education level, sex, race, and health value are held constant. This regression model with control variables predicted 3% of the variability. The balanced processing component was the best and only significant ($p <$ .05) predictor of aerobic physical activity. This meant that as balanced processing scores increased, aerobic physical activity increased. When compared to the correlation analyses, the authentic leadership components had non-significant relationship for both analyses.

Table 14

Multiple regression: Aerobic physical activity and AL components with age, education level, sex, race, and health value controls

	B	SE B	B
Constant	73.16	173.28	
Self-awareness	-8.39	8.74	-.08
Internalized moral perspective	4.49	8.78	.05
Balanced processing	15.93	7.73	.16*
Relational transparency	-7.20	7.83	-.08
Age	1.22	11.33	.01
Education level	-9.56	15.80	-.04
Sex	-8.50	31.39	-.02
Race	31.77	44.55	.05
Health value ranking	-2.05	4.24	-.04

*Significant at p < .05 level.

Overall physical activity. Respondents were also categorized as inactive, insufficiently active, and active based on their responses for the two physical activity questions. If the respondent did not meet either the 2008 Physical Activity guidelines recommendations for muscle strengthening physical activity (two sessions or more per week) or aerobic physical activity (150 minutes or more), they were classified as inactive. If they met either one, but not both, of the 2008 Physical Activity guidelines for muscle

strengthening physical activity and aerobic physical activity, they were classified as

insufficiently active. If they met both the 2008 Physical Activity guidelines

recommendations for muscle strengthening physical activity and aerobic physical activity

(at least two muscle strengthening sessions and 150 minutes of aerobic activity). In this

instance, there was a significant positive relationship between physical activity and the

balanced processing component. This meant that as balanced processing scores

increased, physical activity increased. There were no significant relationships between

physical activity and any of the other three components or the overall authentic

leadership score. Table 15 presents the Spearman's correlation coefficients for authentic

leadership and physical activity categories.

Table 15

Spearman's correlation coefficients: Authentic leadership (AL) and physical activity

categories

AL component	Physical activity categories
Overall AL score	.06
Self-awareness	.05
Internalized moral perspective	-.03
Balanced processing	.14*
Relational transparency	.04

*Significant at p < .05 level.

For another comparison, logistic regression was used to determine if authentic leadership predicts physical activity. Based on the responses to the muscle strengthening and aerobic physical activity questions, respondents were categorized as "active" or "inactive." Respondents who met the 2008 Physical Activity guidelines were considered "active" and those that did not were "inactive." Respondents who performed 150 minutes of aerobic physical activity and at least two sessions of muscle strengthening physical activity weekly were "active" and those that did not were "inactive." The three categories that were used in the correlations above were transformed into two categories. "Active" remained the same as above and "insufficiently active" and "inactive" above were transformed into "inactive." Table 16 presents the results of the logistic regression analysis for the physical activity categories, authentic leadership overall score, authentic leadership components, and the control variables. There was not a significant relationship between authentic leadership and overall physical activity.

Table 16

Logistic regression: Physical activity categories, AL overall score, and AL components

with age, education level, sex, race, and health value controls

	B	SE B	e^{β} (odds ratio)
Constant	-1.23	3.15	
AL overall score	.03	.04	1.03
Self-awareness	.26	.16	1.30
Internalized moral perspective	-.17	.16	.84
Balanced processing	-.03	.13	.97
Relational transparency	.03	.14	1.03
Age	.08	.18	1.08
Education level	-.36	.26	.70
Sex	-.10	.61	.90
Race	-.45	.80	.64
Health Value ranking	-.23	.10	.80*

* Significant at p < .05 level.

Research Question 2: Is there a relationship between authentic leadership characteristics and smoking?

For the data analysis, cigarette smoking was measured as a categorical variable with two categories: non-smoker or smoker (whether a daily smoker or occasional smoker). For coding purposes, non-smokers were coded as 0 and smokers were coded as

1. Authentic leadership was measured by the overall authentic leadership score and the four components, which were: self-awareness, internalized moral perspective, balanced processing, and relational transparency.

The Kolmogorov-Smirnov (K-S) test was significant for cigarette smoking, which means the data were non-normal. Thus, for the quantitative analysis, Spearman's correlation coefficients were used. Spearman's correlation coefficients are utilized when the data are non-normally distributed because it is a non-parametric statistic used when the data are not normally distributed (Field, 2009). Correlation was used to determine the relationship between two variables. Table 17 presents the Spearman's correlation coefficients for authentic leadership and cigarette smoking. There were no significant relationships between cigarette smoking and any of the authentic leadership sub-components or the overall authentic leadership score.

Table 17

Spearman's correlation coefficients: Authentic leadership (AL) components and cigarette smoking

AL component	Smoking
Overall AL score	-.04
Self-awareness	-.03
Internalized moral perspective	.02
Balanced processing	-.04
Relational transparency	-.08

The regression model for cigarette smoking and the overall authentic leadership score accounted for less than 1% of the variation in cigarette smoking. When the control variables were added to the model, this regression model accounted for 8% of the variation in cigarette smoking. Health value ranking was the best and a positive significant predictor of cigarette smoking ($p > .01$). This meant that the lower health value ranking (closer to 1) or the more the individual valued health, the higher the probability of being a non-smoker. Authentic leadership did not have a significant relationship with cigarette smoking when the control variables were added. Table 18 presents logistic regression results for cigarette smoking and authentic leadership overall score with the control variables.

Table 18

Logistic regression: Cigarette smoking and AL overall score with age, education level,

sex, race, and health value controls

	B	SE B	e^β (odds ratio)
Constant	-9.93	5.31	
AL overall score	.02	.07	1.02
Age	.86	.51	2.37
Education level	-.11	.55	.89
Sex	-.79	.91	.45
Race	1.27	1.26	3.57
Health Value ranking	.38	.12	1.46**

** Significant at p < .01 level.

The logistic regression model with the control variables accounted for 9% of the variation in cigarette smoking. In this model, health value ranking was also the best and a negative significant predictor of cigarette smoking (p <.01). This positive relationship meant that the lower the health value ranking (or closer to 1) or the more an individual valued health, the higher the probability of being a non-smoker. The four authentic leadership components did not have a significant relationship with cigarette smoking when the control variables were added. Table 19 presents logistic regression results for cigarette smoking and authentic leadership components with the control variables.

Table 19

Logistic regression: Cigarette smoking and AL components with age, education level,

sex, race, and health value controls

	B	SE B	e^β (odds ratio)
Constant	-11.51	5.92	
Self-awareness	.08	.28	1.08
Internalized moral perspective	.27	.31	1.31
Balanced processing	.13	.27	1.14
Relational transparency	-.33	.26	.72
Age	.73	.51	2.08
Education level	.00	.60	1.00
Sex	-.71	.92	.49
Race	1.49	1.35	4.42
Health Value ranking	.37	.12	1.44**

** Significant at $p < .01$ level.

**Research Question 3: Is there a relationship between authentic leadership
characteristics and fruit and vegetable consumption?**

Fruit consumption and vegetable consumption were measured by separate
variables so they will be explained separately. Authentic leadership was measured by the
overall authentic leadership score and the four components. Those four components

were: (a) self-awareness, (b) internalized moral perspective, (c) balanced processing, and (d) relational transparency.

Fruit consumption. The Kolmogorov-Smirnov (K-S) test was significant for fruit consumption, which means the data were non-normal. Thus, for the quantitative analysis, Spearman's correlation coefficients were used. Spearman's correlation coefficients are utilized when the data are non-normally distributed because it is a non-parametric statistic used when the data are not normally distributed (Field, 2009). Correlation was used to determine the relationship between two variables. Table 20 presents the Spearman's correlation coefficients for authentic leadership and fruit consumption.

Table 20

Spearman's correlation coefficients: Authentic leadership (AL) and fruit consumption

AL component	Fruit consumption
Overall AL score	.10
Self-awareness	.16**
Internalized moral perspective	.11*
Balanced processing	.03
Relational transparency	.05

**Significant at p < .01 level, *Significant at p < .05 level.

There was a significant relationship between fruit consumption and self-awareness, $r_s = .16$, p (one-tailed) $\leq .01$. This meant that as self-awareness scores

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increased, fruit consumption increased. There was also a significant relationship between fruit consumption and internalized moral perspective, $r_s = .11$, p (one-tailed) $< .05$. This meant that as internalized moral perspective scores increased, fruit consumption increased. There were no other significant relationships between fruit consumption and the two other authentic leadership components (balanced processing and relational transparency). Also, the relationship between the overall authentic leadership score and fruit consumption was not significant.

The regression model with control variables predicted 6% of the variation in fruit consumption. Education level was the best and only significant predictor of fruit consumption (p $< .05$). This meant that as education level increased, fruit consumption increased. When a stepwise regression model was used, education level accounted for 3% of the variation in fruit consumption. Table 21 presents the regression analysis results for fruit consumption and overall authentic leadership score with age, education level, sex, race, and health value ranking as controls.

Table 21

Multiple regression: Fruit consumption and AL overall score with age, education level, sex, race, and health value ranking controls

	B	SE B	β
Constant	-.88	1.26	
AL overall score	.01	.02	.04
Age	.08	.08	.07
Education level	.26	.11	.16*
Sex	.32	.22	.11
Race	.46	.30	.11
Health Value ranking	.05	.03	.11

* Significant at p < .05 level.

When the control variables were added in the regression model, the F-ratio was significant (p < .05), meaning this model with the constants improved the ability to predict this outcome. This regression model accounted for 9% of the variation in fruit consumption. Education level (p < .05) and self-awareness (p < .05) were significant. This meant that as education level increased, fruit consumption increased. As scores on the self-awareness component increased, fruit consumption increased. When a stepwise regression analysis was used, education level was the best predictor of fruit consumption (p < .05). Education level accounted for 3% of the variability in fruit consumption.

Table 22 presents the regression results for fruit consumption and the four AL

components, when age, education level, sex, race, and health value are held constant.

Table 22

Multiple regression: Fruit consumption and AL components with age, education level,

sex, race, and health value controls

	B	SE B	β
Constant	-1.10	1.31	
Self-awareness	.14	.06	.20*
Internalized moral perspective	.06	.07	.09
Balanced processing	-.06	.06	-.09
Relational transparency	-.09	.06	-.14
Age	.06	.08	.06
Education level	.24	.11	.15*
Sex	.29	.23	.10
Race	.44	.30	.10
Health value ranking	.04	.03	.10

*Significant at $p < .05$ level.

When compared to the correlation coefficients, the overall authentic leadership

score for both was not significant. Self-awareness was positive and significant in both

analyses. Internalized moral perspective was positive and significant in the correlation,

but non-significant when the control variables were added. Balanced processing and relational transparency were non-significant in both the correlation analyses and regression analyses.

Vegetable consumption. The Kolmogorov-Smirnov (K-S) test was significant for vegetable consumption, which means the data were non-normal. Thus, for the quantitative analysis, Spearman's correlation coefficients were used. Spearman's correlation coefficients are utilized when the data are non-normally distributed because it is a non-parametric statistic used when the data are non-normally distributed (Field, 2009). Correlation was used to determine the relationship between two variables. Table 23 presents the Spearman's correlation coefficients for authentic leadership and vegetable consumption.

Table 23

Spearman's correlation coefficients: Authentic leadership (AL) and vegetable consumption

AL component	Vegetable consumption
Overall AL score	.01
Self-awareness	.08
Internalized moral perspective	.08
Balanced processing	-.10
Relational transparency	.01

There were no significant relationships between any of the components of authentic leadership or the overall authentic leadership score and vegetable consumption. There were also no significant relationships between vegetable consumption and the overall AL score with the control variables added. Table 24 presents the regression results for vegetable consumption and overall AL score, when age, education level, sex, race, and health value are held constant.

Table 24

Multiple regression: Vegetable consumption and AL overall score with age, education level, sex, race, and health value controls

	B	SE B	β
Constant	.28	1.48	
AL overall score	.00	.02	.00
Age	.07	.09	.06
Education level	.07	.13	.04
Sex	.52	.26	.15
Race	.47	.36	.09
Health Value ranking	.03	.04	.05

Balanced processing was the only AL component that had a negative significant relationship with vegetable consumption when the control variables were added. This meant that as scores on balanced processing decreased, vegetable consumption increased.

The other three components did not have a significant relationship with vegetable consumption. Table 25 presents the regression results for vegetable consumption and the four AL components, when age, education level, sex, race, and health value are held constant.

Table 25

Multiple regression: Vegetable consumption and AL components with age, education level, sex, race, and health value controls

	B	SE B	β
Constant	.14	1.55	
Self-awareness	.07	.07	.08
Internalized moral perspective	.14	.08	.17
Balanced processing	-.10	.07	-.12*
Relational transparency	-.09	.07	-.13
Age	.01	.09	.01
Education level	.08	.13	.04
Sex	.50	.27	.14
Race	.49	.36	.10
Health value ranking	.02	.04	.04

*Significant at $p < .05$ level.

Summary

An analysis of the data collected from the online survey was used to determine the relationship between authentic leadership and three physical health behaviors. Spearman's correlation coefficients were used to determine significant relationships between the independent and dependent variables. Multiple regression and logistic regression were used to determine what physical health variables predicted authentic leadership and, while controlling for age, sex, race, and educational level.

The self-awareness component of authentic leadership had a positive significant relationship with muscle strengthening physical activity, which means that higher self-awareness scores are correlated with higher muscle strengthening physical activity. Age was also significantly related to muscle strengthening physical activity. As age decreased, muscle strengthening physical activity increased. The balanced processing component of authentic leadership had a positive significant relationship with aerobic physical activity, when controlling for age, education level, sex, race, and health value. Balanced processing also had a positive significant relationship with the categorization of physical activity (inactive, insufficiently active, and active). This meant that higher balanced processing scores were related to higher physical activity levels.

Health value ranking was a positive significant predictor of cigarette smoking with control variables. Fruit consumption had a positive significant relationship with both the self-awareness component and the internalized moral perspective, which meant that as these scores increased, fruit consumption increased. Education level was a positive significant predictor of fruit consumption with the control variables. The self-awareness

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component of authentic leadership was a positive significant predictor of fruit

consumption, when controlling for age, education level, sex, race, and health value

ranking. This meant that higher self-awareness scores were associated with higher fruit

consumption, when controlling for age, education level, sex, race, and health value

ranking. The balanced processing component had a significant negative relationship with

vegetable consumption, but the overall score and other three components did not have a

significant relationship with vegetable consumption. This meant that as scores on

balanced processing decreased, vegetable consumption increased. Chapter 5 discusses

the findings, limitations, implications for policy and practice, recommendations for future

research, and conclusions.

CHAPTER 5: DISCUSSION OF THE RESEARCH FINDINGS

Chapter 5 includes a discussion of the research findings and connects those findings back to the review of literature and conceptual framework. The findings are organized by each of the three research questions. Also included are limitations, implications for policy and practice, recommendations for future research, conclusions, and a summary.

The purpose of this research study was to examine the relationship between authentic leadership characteristics and physical health behaviors of MU Extension faculty and staff. This study collected data from 261 MU Extension faculty and staff members in January 2015. The main research query for this study was: Is there a relationship between authentic leadership characteristics and physical health behaviors? Physical health was represented by the three behaviors of: physical activity, smoking, and fruit and vegetable consumption. A ranking of terminal values, including health, was also measured to better understand the relationship between authentic leadership and physical health. Demographic information was collected to describe the sample and provided additional information for the qualitative analyses.

Findings

The findings connect the results from the data analyses to the conceptual framework and review of literature. First, a summary of the results is presented to answer the research question. Then, connections to previous research studies are discussed. The findings are organized by each research question.

Research Question 1: Is there a relationship between authentic leadership characteristics and physical activity?

The overall authentic leadership score did not have any significant relationships with muscle strengthening physical activity, aerobic physical activity, or the classification of overall physical activity. The explanation for the non-significant findings for the overall authentic leadership score relate to the barriers of participating in physical activity. Time, inconvenience, lack of personal motivation, or lack of enjoyment are barriers to physical activity participation (Donatelle, 2002). Despite authentic leaders knowing the value and importance of physical activity, they may not find the time, desire, or energy to participate outside of professional responsibilities. Although the health benefits of physical activity are well-known, many Americans do not participate in physical activity (Donatelle, 2002). Physical activity is a known stress reliever and participation can help manage stress levels for professionals (Donatelle, 2002).

Health is a broad concept and describes more than just physical health behaviors, such as physical activity. Individual health, well-being, and wellness also describe behaviors related to social, emotional, mental, spiritual, and environmental health. Macik-Frey et al. (2009) described a model of positive health that connected to authentic leadership. However, their model connected spiritual, emotional, and psychological health more than the other dimensions, describing areas related to the mind and psychology. Thus, overall general wellness, or other areas of health may have a bigger connection to authentic leadership than the area of physical health. While spiritual

health, emotional health, psychological health, and physical health contribute to overall health, well-being, and wellness, an individual can have one without the others.

Luthans and Avolio (2003) noted four positive psychological capacities of authentic leadership: confidence, hope, optimism, and resilience. Those four characteristics are most related to psychological, mental, or emotional health but not physical health. Other studies also connected psychological or spiritual health and authentic leadership (Ilies et al., 2005; Klenke, 2007; Kuoppala, 2008).

When the four components of authentic leadership were analyzed, self-awareness was found to have a significant relationship with muscle strengthening physical activity. Self-awareness means being aware of our values, identity, emotions, and beliefs (Northouse, 2010). The relationship between self-awareness and muscle strengthening physical activity can be explained by the conceptual framework of the Goolsby Leadership Model (Quick et al., 2007).

The Goolsby Leadership Model (Quick et al., 2007) has three core concepts: integrity, courage, and impact. The concept of integrity is broken down further into two components: authenticity and emotional competence. Self-awareness is a key concept in both authenticity and emotional competence, therefore making it a key component of integrity (Quick et al., 2007). Self-awareness is a key factor related to the development of authentic leadership (Gardner et al., 2005). The practice of knowing ourselves and our values provides a basis for decisions, actions, and ultimately, a more authentic self (Gardner et al., 2005). Self-awareness is also one component of self-confidence and practicing physical activity is one way to improve self-confidence (Donatelle, 2002).

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However, self-awareness did not have a significant relationship with aerobic physical activity. In the sample, the median for aerobic physical activity was only 80 minutes per week, which means half of the sample is getting less than 80 minutes a week of aerobic physical activity. The respondents' low participation in aerobic physical activity influenced the non-significant findings for self-awareness and aerobic physical activity.

The balanced processing component of authentic leadership was found to have a significant relationship with aerobic physical activity and the three physical activity classifications (inactive, insufficiently active, and active). Balanced processing is about respecting others' perspectives and being objective and unbiased with information. It is about being open, yet objective. Balanced processing can be connected to the Goolsby Leadership Model (Quick et al., 2007) in the area of authenticity. Authenticity is one key component of authentic leadership and balanced processing is one component of authentic leadership. Balanced processing is a self-regulatory behavior, which is a fundamental concept related to authentic leadership (Gardner et al., 2005).

Integrity and courage lead to impact, which is defined as individual health and organizational health. The Goolsby Leadership Model described authentic leaders who live by their core values as resulting in improved individual and organizational health (Quick et al., 2007). The authentic leadership components of self-awareness and balanced processing are both about knowing ones' core values and beliefs and being self-regulatory. Participation in muscle strengthening physical activity and aerobic physical activity are action behaviors related to having health as a core value.

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The explanations for the non-significant findings for the other two components of authentic leadership (internalized moral perspective and relational transparency) relate to the barriers of participating in physical activity, similar to the non-significant findings with the overall authentic leadership score. Internalized moral perspective and relational transparency may relate to other areas of health rather than physical health.

When considering the overall findings for physical activity and authentic leadership, the connection between authentic leadership and physical activity habits may not be as important when considering how individuals take care of their physical health. Physical activity is only one habit related to the broad concept of health and there are many other behaviors that impact physical health. Individuals may value their overall health, but may not participate in physical activity to improve their physical health. In those who value health, their spiritual, emotional, mental, or psychological health may be prioritized over physical health. If authentic leaders are setting personal goals to improve their health (which includes physical activity), it will benefit their health, even if the relationship to authentic leadership was not strong in this research study. In summary, two of the authentic leadership components had significant relationships with physical activity. The other two components and the overall authentic leadership score did not have significant relationships.

Research Question 2: Is there a relationship between authentic leadership characteristics and smoking?

There were no significant relationships between cigarette smoking and the authentic leadership overall score or four authentic leadership components. The

relationship between cigarette smoking and authentic leadership was a statistically non-significant relationship without and with control variables. The relationship between the four authentic leadership components were also statistically non-significant relationships.

The health value terminal ranking was a significant predictor of cigarette smoking, with the control variables of authentic leadership overall score, age, education level, sex, and race. The health value terminal ranking was also a significant predictor of cigarette smoking, when controlling for authentic leadership components, age, education level, sex, and race. The overall authentic leadership score and three of the components (self-awareness, internalized moral perspective, and balanced processing) were positive, non-significant predictors of cigarette smoking, when controlling for age, education level, sex, race, and health value ranking.

One reason for the lack of significant findings between cigarette smoking and authentic leadership is the complicated nature of cigarette smoking behavior. Addiction and paired associations that trigger cravings make it difficult to stop smoking (Donatelle, 2002). Nicotine is delivered to the brain within seconds of smoking and displeasure occurs when the paired association of missing (Donatelle, 2002). Nicotine addiction may also have a genetic component (Donatelle, 2002). One of other reasons for the non-significant relationships between cigarette smoking and authentic leadership is the low number of smokers in the population. Less than 10% of the sample were smokers, as compared to 20% of the U.S. population (National Center for Health Statistics, 2011a). In those with an undergraduate degree, the number of smokers decreased to 9% (Centers for Disease Control, 2014).

Research Question 3: Is there a relationship between authentic leadership characteristics and fruit and vegetable consumption?

The overall authentic leadership score did not have a significant correlation with fruit or vegetable consumption. The lack of significant findings could be related to the barriers associated with not eating healthy and not eating the recommended servings of fruits and vegetables. Three common barriers of not eating the recommended amount of fruits and vegetables are: access to fruits and vegetables, cost of fruits and vegetables, and availability of fruits and vegetables (Centers for Disease Control, 2013b). These barriers prevent authentic leaders from eating healthy even if they know the importance of a diet containing fruits and vegetables.

Similar to the explanation for the lack of findings between physical activity and authentic leadership, fruit and vegetable consumption may just not have a connection to authentic leadership. Previous research has found a connection between psychological, spiritual, or mental health (Ilies, Morgeson, & Nahrgang, 2005; Klenke, 2007; Kuoppala, 2008; Luthans & Avolio, 2003) but physical health may not be related to authentic leadership.

The self-awareness component and internalized moral perspective component both had positive significant relationships with fruit consumption. As self-awareness and internalized moral perspective scores increased, so did fruit consumption. The significant relationship between self-awareness and fruit consumption can be explained by Goolsby Leadership Model (Quick et al., 2007). Similar to the findings with physical activity,

self-awareness is a component of integrity. Integrity plus courage leads to impact, which leads to individual health and organizational health.

Internalized moral perspective means using individual values and morals to guide behavior. Therefore, if someone values health by eating healthy, they know that fruit is part of a healthy eating plan. Internalized moral perspective is related to both authenticity, which is part of integrity; and character, which is included in the area of courage in the Goolsby Leadership Model (Quick et al., 2007). Internalized moral perspective is a self-regulatory process, which is one of the fundamental components of authentic leadership (Gardner et al., 2005).

The balanced processing component of authentic leadership had a significant relationship with vegetable consumption, with control variables. This relationship was negative, meaning that as the balanced processing score increased, vegetable consumption decreased. This was an unexpected finding, as the other findings were positive. No significant relationships were found between the overall authentic leadership score or the other three components.

Fruit consumption had a significant relationship with educational level. As education levels increased, fruit consumption increased. The benefits of higher education are well-known (Baum, Ma, & Payea, 2005), but this research study found an additional benefit in increased consumption of fruits. Fruit contains many vitamins and nutrients for optimal health and wellness.

Limitations

All research studies have limitations. The researcher attempted to reduce the limitations prior to data collection. One limitation of this study was generalizability of the results. Study results were not generalizable to other higher education organizations due to the unique nature of University of Missouri Extension. The results were not generalizable to other organizations, state Cooperative Extension services, or to University of Missouri. The findings are only relevant to the sample surveyed and not the general population. While the sample was heterogeneous in regard to the organization, the sample was not heterogeneous to a general population. Educational levels, racial background, and cultural background vary more in a general population when compared to the sample for this research study.

Another limitation of this study was the lack of sampling, but instead use of the entire population. The hope was that using the entire population would increase the number of respondents. The small sample size is another limitation. Two hundred and sixty-one respondents completed the online survey with about 250 responses for most survey questions. Thus, the findings cannot be generalized to a general population for this reason.

Another limitation related to data collection issues. One of the weaknesses of the muscle strengthening physical activity survey question was that it asked "how many sessions of muscle strengthening physical activity". The word "session" could have multiple meanings, so the question would have been better suited to read, "How many days of muscle strengthening physical activity" for easier interpretation.

Self-reported data leads to another limitation of this study. While the hope is that respondents are honest about their leadership characteristics and health behaviors, it is possible that study participants exaggerated their responses to some of the questions. Survey respondents may have over- or under-reported their responses to any of the questions related to authentic leadership or physical health. They may also have selective memory or forget when asked to respond to questions that may ask them about past behaviors over the last 30 days related to physical activity, smoking, or fruit and vegetable consumption. It is not known if the responses are factual or based on what the respondents think they should answer.

An improvement to this research study would be to use a sample with a bigger variety in the overall authentic leadership scores. In this study, over 98% of the respondents were "high" or "very high" in authentic leadership, resulting in a large number of scores in those two categories. One explanation for that could be that those who took the initiative to respond to the survey are the leaders within the organization. Those with "very low" or "low" authentic leadership characteristics may have chosen not to participate in the survey. The lack of variability influenced the non-significant findings for the authentic leadership scores. For comparison, other research studies that used the authentic leadership questionnaire reported higher means for the overall authentic leadership score and the four components than this study. Walumbwa et al. (2008) used the authentic leadership questionnaire and reported the means for the four authentic leadership components as lower than the means for this research study. Wong and Laschinger (2012) used the authentic leadership questionnaire and reported the

means for authentic leadership and the four components as much lower than the means for this research study.

Implications for Policy and Practice

This section discusses the implications for policy and practice. While the overall authentic leadership score was not significantly related to the three health behaviors and connections were only found in three of the four authentic leadership components, it is still important for leaders to practice a healthy lifestyle. Practicing healthy behaviors, in all areas of health, is important for well-being, vitality, and longevity (Donatelle, 2002). Leaders influence followers, whether in healthy living, workplace practices, or other areas of life. Leaders serve as role models for work colleagues and peers, so their healthy lifestyle influences those around them. Based on the survey responses, there are two areas which can be addressed by health promotion policy and practice. These two areas are increasing vegetable consumption and encouraging more physical activity.

The mean of fruit consumption in this study was about 2 cups, which meets the recommendation for most adults from the 2010 Dietary Guidelines. In this study, those with higher levels of education were more likely to eat fruit. The mean for vegetable consumption was just over 2 cups per day, which is less than the recommendation for most adults from the 2010 Dietary Guidelines. If the sample population would increase their vegetable consumption by 1 cup per day, many would be meeting the 2010 Dietary Guidelines recommendations. Many health organizations are working to address the barriers for increasing vegetable consumption. This work is important for policy and practice in the area of health education.

Over 50% of respondents participated in no muscle strengthening physical activity. In the sample, 14% participated in no aerobic physical activity. The median for aerobic physical activity was 80 minutes per week, which is just over half of the 2008 Physical Activity guidelines recommendation (150 minutes per week). When compared to the current recommendations, 69% of the respondents did not meet the 2008 Physical Activity guidelines recommendation for aerobic physical activity (150 minutes per week). When compared to the 2008 Physical Activity guidelines, 53% were inactive (did not meet either muscle strengthening or aerobic physical activity recommendations), 36% were insufficiently active (met one recommendation but not both), and 11% were active (met both muscle strengthening and aerobic physical activity recommendations. Health organizations are also working to address the barriers relative to physical activity participation, which is important for policy and practice in health education.

It is important for authentic leaders to manage stress and stay grounded. Eating healthy, refraining from tobacco use, and staying active are three ways to live a healthy lifestyle. While this research study did not find significant relationships between all components of authentic leadership and the total authentic leadership score, living a healthy lifestyle is still important for health and well-being. There is just not a strong connection between authentic leadership to physical health behaviors. Other theories of leadership may have a better connection to physical health. For example, transformational leadership has conceptual similarities with authentic leadership (Walumbwa et al., 2008) and emotional intelligence is a leadership trait with similarities to authentic leadership (Northouse, 2010).

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Organizations, businesses, and companies seek "those with leadership abilities because they bring special assets to their organization and, ultimately, improve the bottom line" (Northouse, 2010, p. 1). These same organizations know the importance of the health of their employees, both to decrease health care costs and to improve productivity. Leadership and health are equally important concepts in the workplace, but may not be related to one another. Research supports health promotion programs in the workplace because of the benefits of increasing worker productivity (Task Force on Community Preventive Services, 2010) and institutional effectiveness (Goetzel & Ozminkowski, 2008). Health promotion efforts are an investment in human capital (Goetzel & Ozminkowski, 2008).

Self-awareness and balanced processing were the two components of authentic leadership that were most related to physical health behaviors (except cigarette smoking). Interventions to improve these two specific components could lead to healthier employees and healthier organizations. Specific professional development or training linked to enhancement of self-awareness and balanced processing would be beneficial to organizations.

Recommendations for Future Research

Even though there was not a strong relationship between authentic leadership characteristics and physical health behaviors, other dimensions of health may be more strongly related to authentic leadership. Authentic leadership has its' roots in positive psychology (Quick & Quick, 2004), so emotional or mental health may have a stronger

relationship with authentic leadership characteristics. Future research studies could focus on psychological, spiritual, or mental health and authentic leadership.

Self-awareness and balanced processing had significant relationships with two of the physical health behaviors, so it would be interesting for future research to focus on these two components of authentic leadership and physical health. Self-awareness and balanced processing are key components of authenticity, emotional competence, (Quick et al., 2007) and emotional intelligence (Northouse, 2010). It would be thought-provoking to look at the relationship between the trait of self-awareness and physical health behaviors. The component of internalized moral perspective also had a significant relationship with some of the health behaviors, so future research could also focus on this component.

All leaders should practice stress management techniques, whether by physical health behaviors, psychological health behaviors, or spiritual health behaviors. Future research could focus on the relationship between stress management and physical health behaviors in authentic leaders. Other theories of leadership may also have a stronger relationship with physical health and that relationship could be explored in future research.

Conclusions

The overall authentic leadership score did not have a significant relationship with any of the three physical health behaviors. Significant relationships were found in only a few of the authentic leadership components and physical activity, fruit consumption, and vegetable consumption. Self-awareness was one authentic leadership component that had

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a significant relationships with physical health, both with physical activity and fruit consumption. Self-awareness is one of the key pieces in the Goolsby Leadership Model (Quick et al., 2007) which connects authentic leadership and individual and organizational health. Balanced processing had a significant relationship with physical activity and a negative significant relationship with vegetable consumption.

No significant relationships were found between authentic leadership or the four components of authentic leadership and cigarette smoking. Despite the known risk, cigarette smoking behavior is complex and may not be influenced by health values. Addiction and paired associations are powerful influencers of cigarette smoking behavior (Donatelle, 2002).

Just under half (49%) of the survey respondents ranked health as one of their top three values out of the 18 terminal values. According to the responses, almost half of the respondents believe that health is important, but many do not participate in behaviors that improve their physical health. The survey did not ask respondents about other areas of health, such as emotional, mental, or social health. Health behavior theory and research has studied health behaviors for many years, but there continues to be no clear reasons why some people behave in unhealthy ways, despite knowing the risk (Donatelle, 2002).

Summary

Chapter 5 discussed the findings relative to each research question, limitations, implications for policy and practice, recommendations for future research, and conclusions. Overall authentic leadership was not significantly related to any of the three physical health behaviors. However, the components of self-awareness, balanced

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processing, and internalized moral perspective were significantly related to one or more of the physical health behaviors. While physical health and authentic leadership characteristics are both important concepts in the workplace, the relationship between the two is not as strong as hypothesized. Authentic leadership may have a better connection to other dimensions of health besides physical health and those who value overall health may not be participating in behaviors to improve their physical health. Authentic leaders who exhibit self-awareness, balanced processing, and internalized moral perspective qualities serve as healthy role models to peers and colleagues which leads to improved organizational health.

APPENDIX A

Institutional Review Board Approval

Campus Institutional Review Board
University of Missouri-Columbia

485 McReynolds Hall
Columbia, MO 65211-1150
PHONE: (573) 882-9585
FAX: (573) 884-0663

December 11, 2014

Principal Investigator: Bess, Melissa M
Department: West Central HES

Your Application to project entitled *Authentic Leadership and Physical Health Behaviors in Extension Professionals* was reviewed and approved by the MU Campus Institutional Review Board according to terms and conditions described below:

IRB Project Number	1213872
Initial Application Approval Date	December 11, 2014
IRB Expiration Date	December 11, 2015
Level of Review	Exempt
Project Status	Active - Open to Enrollment
Regulation	45 CFR 46.101b(2)
Risk Level	Minimal Risk

The principal investigator (PI) is responsible for all aspects and conduct of this study. The PI must comply with the following conditions of the approval:

1. No subjects may be involved in any study procedure prior to the IRB approval date or after the expiration date.
2. All unanticipated problems, serious adverse events, and deviations must be reported to the IRB within 5 days.
3. All modifications must be IRB approved by submitting the Exempt Amendment prior to implementation unless they are intended to reduce risk.
4. All recruitment materials and methods must be approved by the IRB prior to being used.
5. The Annual Exempt Form must be submitted to the IRB for review and approval at least 30 days prior to the project expiration date.
6. Maintain all research records for a period of seven years from the project completion date.
7. Utilize the IRB stamped document informing subjects of the research and other approved research documents located within the document storage section of eIRB.

If you have any questions, please contact the Campus IRB at 573-882-9585 or umcresearchcirb@missouri.edu.

Thank you,

Charles Borduin, PhD
Campus IRB Chair

APPENDIX B

Informed Consent

Consent to participate in survey
Researcher's Name: Melissa Bess, Ed.D. candidate, supervised by Bradley Curs, Associate
Professor, Educational Leadership and Policy Analysis
Project Title: Authentic Leadership and Physical Health Behaviors in Extension Professionals

You are being asked to voluntarily participate in a research survey for a doctoral student in the
Department of Education Leadership and Policy Analysis at the University of Missouri –
Columbia. This research is being conducted to help the researcher understand the relationship
between authentic leadership and physical health behaviors. When you are invited to participate
in research, you have the right to be informed about the study procedures so that you can decide
whether you want to consent to participation.

You have the right to know what you will be asked to do so that you can decide whether or not to
be in the study. Your participation is voluntary. You may refuse to participate and nothing will
happen. You may stop at any time if you do not want to continue to be in the study without
penalty. There are no risks to participation in this study. The benefit of participation in this study
is to add to the research base on connecting leadership and health. Organizations can use this
research to inform leadership education, health promotion activities, and other resources to create
healthy and productive employees.

This survey will take approximately 30 minutes. Names and personal information will not be
collected in this survey, so your identity and participation will remain anonymous. Aggregate
data will be published. However, individual data will not be shared with anyone except the
student investigator, Melissa Bess, and her doctoral supervisor, Bradley Curs. Thank you for your
participation.

Researcher Contact Information: Melissa Bess, Ed.D. candidate in Educational Leadership and
Policy Analysis, student investigator bessmm@missouri.edu 573-346-2644
Bradley Curs, Associate Professor, Educational Leadership and Policy Analysis, doctoral
supervisor cursb@missouri.edu

Please contact the University of Missouri Campus Institutional Review Board if you have
questions about your rights, concerns, complaints or comments about research participation.
Campus Institutional Review Board 483 McReynolds Hall Columbia, MO 65211 573-882-9585
E-Mail: umcresearchcirb@missouri.edu
Website: http://www.research.missouri.edu/cirb/index.htm

APPENDIX C

Sample Questions from Research Survey

3. Cigarette smoking: How would you characterize your smoking habits?
- Daily smoker
- Occasionally or smoke in social situations, but not daily
- Non-smoker

(Answer If Cigarette smoking: How would you characterize your smoking habits? Occasionally or smoke in social situations, but not daily Is Selected)

4. Cigarette smoking: In the past 30 days, how many days did you have a cigarette?
(Answer If Cigarette smoking: How would you characterize your smoking habits? Daily smoker Is Selected)

5. Cigarette smoking: During the past 12 months, have you stopped smoking for one day or longer because you were trying to quit smoking?
- Yes
- No

(Answer If Cigarette smoking: How would you characterize your smoking habits? Non-smoker Is Selected)

6. Cigarette smoking: How long has it been since you last smoked a cigarette, even one or two puffs?
- Past month
- Past three months
- Past six months
- Past year
- Past five years
- Past ten years
- More than ten years
- Have never smoked

7. Physical Activity: In the past 30 days, how many SESSIONS per week of muscle strengthening physical activities did you participate in (on average)? (muscle strengthening activities include weight training, push-ups, etc)

8. Physical Activity: In the past 30 days, how many MINUTES per week of aerobic physical activities did you participate in (on average)? (includes walking, jogging, aerobic classes, biking, hiking, swimming).

9. Fruits/vegetables: In the past 30 days, how many cups of fruits did you eat daily (on average)?
*One cup of fruit also equals 1 small apple, 1 large banana or orange, 1 medium grapefruit, 8

large strawberries, 1 large peach, 1 medium pear, 32 grapes, 1/2 cup of dried fruit, or 1 cup of 100% fruit juice.

10. Fruits/vegetables: In the past 30 days, how many cups of vegetables did you eat daily (on average)? *One cup of vegetables also equals 2 cups of raw leafy vegetables (spinach, romaine), 2 cups of raw lettuce, 1 cup of cooked leafy vegetables, 1 cup of vegetable juice, 1 large ear of corn, 1 medium boiled or baked potato,or 12 baby carrots.

Permission for Authentic Leadership Questionnaire

m\nd garden

To whom it may concern,

This letter is to grant permission for Melissa Bess to use the following copyright material for his/her research:

Instrument: *Authentic Leadership Questionnaire (ALQ)*

Authors: *Bruce J. Avolio, William L. Gardner, and Fred O. Walumbwa*

Copyright: *2007 by Bruce J. Avolio, William L. Gardner, and Fred O. Walumbwa*

Three sample items from this instrument may be reproduced for inclusion in a proposal, thesis, or dissertation.

The entire instrument may not be included or reproduced at any time in any published material.

Sincerely,

Mind Garden, Inc.
www.mindgarden.com

APPENDIX E

List of Rokeach's (1967) terminal values

- A comfortable life

- Equality

- An exciting life

- Family security

- Freedom

- Health

- Inner harmony

- Mature love

- National security

- Social recognition

- True friendship

- Wisdom

- A world of peace

- A world of beauty

- Pleasure

- Salvation

- Self-respect

- A sense of accomplishment

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VITA

Melissa Bess was born in 1980 in St. Louis, MO to Stephen and Sheila Bess. She grew up in Farmington, MO and graduated from Park Hills Central in Park Hills, MO in 1998 as salutatorian of her graduating class. Melissa began her postsecondary education at Southeast Missouri State University in Cape Girardeau, MO and majored in health management: Fitness and sports medicine and was a member of Alpha Xi Delta sorority. After graduating in May 2002, she then began her graduate work in exercise science and health promotion at Middle Tennessee State University in Murfreesboro, TN and served as a graduate teaching assistant during that time. After graduating in December 2013, Melissa then moved back to Missouri and began her career search. In December 2014, she began employment as a Nutrition and Health Education Specialist with University of Missouri Extension in Camdenton (Camden County). Melissa currently lives in Camdenton, MO and enjoys being physically active, playing sports, watching Mizzou football, traveling, reading, and spending time with friends and family.