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Sugar Intake and the Five Personality Traits of Millennials

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Abstract

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Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

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Abstract

Sugar intake continues to be connected to an increased risk of heart diseases, diabetes, arthritis, and certain forms of cancers, depression, and schizophrenia. The purpose of the study was to examine if sugar intake is related to personality traits in the Millennial population. The health belief model was used as the theoretical framework for conducting the study. The research questions addressed in the current study were in regards to the relationships between Millennials daily sugar intake and openness, conscientiousness, extraversion, agreeableness, and neuroticism. This study was a cross-sectional design in which a panel of randomly selected United States Millennials (N = 106) between the ages of 18-34 were requested to complete a demographic questionnaire and the Big Five Inventory. The survey was conducted online using SurveyMonkey. Multiple linear regression was used to test the five stated hypotheses. Study results indicated no significant relationship between sugar intake and the five personality traits ($p > .05$). A sequential multiple regression model after controlling for age and gender indicated no significant relationship between the five personality traits and Sugar Intake ($p > .05$). In effecting positive social change, further investigations are warranted to establish the relationships between personality traits and sugar intake which may help to inform policy to reduce the associated health risks of consuming high sugar.

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Dedication

To my parents Masar and Rexhbije Gashi, my children Laila and Leon, and my husband Michael.

Acknowledgments

I would like to present my genuine appreciation to the faculty who served on my committee: Dr. John Nemecek and Dr. Michael Schwab, committee chairperson; Dr. Bin Cai, methodology expert; Dr. Gudeta Fufaa, URR. Thank you for your time, benevolence, and support.

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Chapter 1: Introduction to the Study

Introduction

Individuals who consumed 25% more sugar than the national average were two times more likely to pass away due to heart disease compared to individuals whose diets were below 10% of sugars added (Yang et al., 2014). According to the Continuing Survey of Food Intakes by Individuals (CSFII) 1994–96, individuals participating in the Food Stamp Program are likely to consume added sugars as well as total fats and meats, but not healthy options such as fruits, grains, vegetables, or dairy products (wi & Smallwood, 2003; Wilde, McNamara, & Ranney, 2000). Recent 2016 dietary guidelines strive to lessen the typical American's sugar intake in half due to the negative health effect of sugar. The United States Department of Health and Human Services as well as the United States Department of Agriculture (2015) affirmed adding sugars to diets ought to be restricted to no more than 10% of the daily caloric intake. A diet high in sugar is linked to increased blood pressure and stimulation of the liver releasing additional unsafe fats into the blood stream (Tappy & Le, 2010). Given the current prevalence of nutrition-related health problems and their social costs, diet modifications to reduce sugar intake are urgently needed (Romieu et al., 2016).

Background

Consuming high sugar is known to contribute to the high prevalence of obesity and obesity-related health issues in the United States. Ogden, Carroll, Kit, and Flegal (2012) called attention to statistics identifying two out of three adults in the United States

and one child out of three are considered obese or to have excess body fat. Additionally, the nation spends an estimated $190 billion a year treating obesity-related health conditions (Flegal, Caroll, Kit, & Ogden, 2012). The growing consumption of sugary drinks has been identified as one of the main reason for the obesity epidemic (Cawley & Meyerhoefer, 2012). A common 20-ounce soda drink encompasses 15 to 18 teaspoons of sugar and generally more than 240 calories. Whereas a 64-ounce fountain cola drink has the potential to contain around 700 calories (U.S. Department of Agriculture, 2012). Individuals whose diets comprise of the aforementioned "liquid candy" in turn do not feel satisfied or as content compared to individuals that may have eaten the same calories from solid food (Pan & Hu, 2011, p. 385-390). Many things including human traits drive sugar intake.

Although there are a series of robust studies researching obesity and mental health disorders, diminutive exploration has been led with regards to the association among Millennials trait personalities including openness, conscientiousness, extraversion, agreeableness, and neuroticism, along with their sugar intake (Halfon, Larson, & Slusser, 2013; Nichele & Yen, 2016).

The five-factor model of personality (FFM) was constructed proceeding the efforts of Costa and McCrae since 1985, which reposed on prior work within traits in addition to further comprehensively advanced five measures of personality (Digman, 1990). The trait based theory assesses conduct as an immediate consideration of an individual's personality traits and that the traits are commonly measured to be precise

accounts of humanity that are reliable throughout time (Courneya, Friedenreich, Sela, Quinney, & Rhodes, 2002).

Personality traits impact an individual's life profoundly along with behavior implementations (McCrae & Costa, 1992). Therefore, personality traits should be assessed for modification and adjustment of treatment objectives and goals (p. 367). According to McCrae and Costa (1992), the five personality traits can be supportive in understanding an individual with regard to "emotional, experiential, interpersonal, and motivational styles" which sequentially offers an educational professional with pertinent information on how to comprehend a client, optimally help a client, as well as permit a fast formation of an empathetic then therapeutic connection (p. 369). Besides knowing how personality relates to sugar intake in Millennials, it is equally important to know how personality characteristics may improve identification of an underlying issue (i.e., heart, blood pressure, and glucose related problems) that has yet to be understood.

Problem Statement

Sugar intake has been linked with an increased risk of heart diseases (Yang et al., 2014), diabetes (Basu, Yoffe, Hills, & Lustig, 2013), arthritis (Hu et al., 2014), certain forms of cancers (Jiang et al., 2015), depression (Dipnall et al., 2015), and schizophrenia (Franklin et al., 2016). Strong evidence supports that sugar is associated with weight gain, cavities, and recently confirmed with an increased risk of heart disease (American Heart Association [AHA], 2016). A recently published study highlights that a diet high in added sugars may increase heart disease and early death even for individuals who are not

overweight (Yang et al., 2014). In a study where contributors' Healthy Eating Index was measured showing how accurately their diets correspond with federal guidelines, individuals who consumed more sugar still had higher cardiovascular mortality (Willett, 2011).

Dietary factors, in particular intake of sugar, is considered a representative risk influence as well as an indicator for the progression of ailments such as hypertension, raised risk of obesity, metabolic syndrome, and Type II diabetes mellitus (CDC, 2013). The Center for Disease Control (CDC, 2013) reported that high blood pressure in the United States alone amounts to $46 billion annually including the expense for health care services, treatment medications, and days missed at work. The CDC spotlighted the significance of sustaining recommended levels of sugar intake especially for people diagnosed with high blood pressure. Aside from the predisposed risk factors already established, an individual's daily sugar intake could impact other aspects of their daily life.

Personality traits have long been linked to health related issues. Predominant research has been directed with regard to eating disorders and extreme personality traits. Eating disorders is a term that covers several diagnoses such as anorexia nervosa, bulimia nervosa, and eating disorder not otherwise specified as outlined in the Diagnostic and Statistical Manual of Mental Disorders Fourth Edition (DSM-IV) (2000). Aside extensive research on the extreme characteristics of personality, there has been no research on general personality traits and how they may relate to sugar intake. That is, there is no

research that has been conducted on how an individual's five basic dimensions of personality including (a) openness, (b) conscientiousness, (c) extraversion, (d) agreeableness, and (e) neuroticism relate to daily sugar intake.

Purpose of the Study

The purpose of the study is to investigate if there is a relationship among the big five personalities that include (a) openness, (b) conscientiousness, (c) extraversion, (d) agreeableness, and (e) neuroticism, and one's daily sugar intake. The aim of the study is to test whether the independent variable (openness, conscientiousness, extraversion, agreeableness, neuroticism) predicts the dependent variable (daily sugar intake). Findings may provide practitioners with information that expands current research and tools that can be used to reduce the amount of sugar that is currently being consumed by Millennials.

Research Questions and Hypotheses

Based on the health belief model and lack of research on the relationship between personality traits and sugar intake, the following research question and associated hypothesis is:

RQ1: What is the relationship between a model containing five personality traits (Openness, Conscientiousness, Extroversion, Agreeableness, and Neuroticism) and frequency of Millennials daily sugar intake?

$H_0$1: There is no relationship between a model containing five personality traits (Openness, Conscientiousness, Extroversion, Agreeableness, and Neuroticism) and frequency of Millennials daily sugar intake.

H_a1: There is a relationship between a model containing five personality traits (Openness, Conscientiousness, Extroversion, Agreeableness, and Neuroticism) and frequency of Millennials daily sugar intake.

- Dependent Variable: Frequency of Daily sugar intake
- Predictor Variables: Openness, Conscientiousness, Extroversion, Agreeableness, and Neuroticism score
- Statistical analysis: Multiple Linear Regression

If the hypothesized model is significant, the five latent personality constructs were evaluated to determine if they uniquely predict frequency of daily sugar intake.

$H_0$2: There is no relationship between Openness and frequency of daily sugar intake.

- Dependent Variable: Frequency of Daily sugar intake
- Predictor Variable: Openness score
- Statistical analysis: Multiple Linear Regression

$H_0$3: There is no relationship between conscientiousness and frequency of daily sugar intake.

- Dependent Variable: Frequency of Daily sugar intake
- Independent Variable: Conscientiousness score

- Statistical analysis: Multiple Linear Regression

$H_0$4: There is no relationship between extraversion and frequency of daily sugar intake.

- Dependent Variable: Frequency of Daily sugar intake
- Independent Variable: Extraversion score
- Statistical analysis: Multiple Linear Regression

$H_0$5: There is no relationship between agreeableness and frequency of daily sugar intake.

- Dependent Variable: Frequency of Daily sugar intake
- Independent Variable: Agreeableness score
- Statistical analysis: Multiple Linear Regression

$H_0$6: There is no relationship between neuroticism and frequency of daily sugar intake.

- Dependent Variable: Frequency of Daily sugar intake
- Independent Variable: Neuroticism score
- Statistical analysis: Multiple Linear Regression

Theoretical Framework for the Study

The health belief model (HBM) is considered a psychological representation that strives to describe and predict health behaviors. The HBM focuses on the attitudes and beliefs of individuals (Rosenstock, 1974). Specifically, the HBM was first established in the 1950s by social psychologists Hochbaum, Rosenstock, and Kegels employed within

the U.S. Public Health Services (Rosenstock, 1974). The model was established in response to the failure of a free tuberculosis health screening program (Rosenstock, 1974). From then, the HBM has been qualified to examine a variety of long- and short-term health behaviors, including sexual risk behaviors and the transmission of HIV/AIDS (Champion, 1984).

The HBM is grounded on the consideration that an individual will take a health-related action (e.g., measles, mumps, and rubella vaccination) if that individual (a) senses that a negative health disorder (e.g., measles) can be averted, (b) has an optimistic anticipation that by taking a suggested action, the individual will evade an unfavorable health circumstance (e.g. takes vaccines to avoid future illnesses), and (c) expects the individual can effectively take a suggested health action given available resources (Sharma, 2016).

The HBM was specified with regard to the four concepts portraying the perceived threat and net benefits: (a) perceived susceptibility, (b) perceived severity, (c) perceived benefits, and (d) perceived barriers (Becker, Radius, & Rosenstock, 1978). The four concepts of the HBM were designed to account for an individual's willingness to act. A new expansion of the HBM is the idea of self-efficacy or an individual's assurance of aptitude to effectively carry out an activity (Andersen, 2008). The recent notion was annexed by Rosenstock and colleagues during 1988 with efforts to advance the HBM meet the hurdles of altering recurring unwholesome conducts including inactive lifestyles, smoking, and binge eating (Andersen, 2008). This addition dovetails with the

notion that individuals will act at reducing intake of an item if they knew the deleterious effects of the substance (Andersen, 2008). Further, since self-efficacy is a component of the five basic dimensions of personality, cognitive schema plays part in dietary behavior, which subsequently effects overall health (Andersen, 2008). The HBM has been identified particularly advantageous for disease prevention (Sharma, 2016). Selecting the appropriate educational contribution is vital to reaching objectives.

Nature of the Study

The proposed study were a quantitative, nonexperimental correlational design that will employ survey approach using a SurveyMonkey panel to collect data from Millennials. Approximately 92 Millennials were sought to complete a survey consisting of a demographic section, including sugar intake, and the Big Five Personality inventory. Participants must have met age criteria and be willing to participate. Gender, education, or ethnicity were not be a condition of selection.

According to Leedy and Ormrod (2001), quantitative research "involves either identifying the characteristics of an observed phenomenon or exploring possible correlations among two or more phenomena" (p. 191). Cooper and Schindler (2008) advocated that the research design is the "blueprint for fulfilling objectives and answering questions" (p. 89). A quantitative design refers to the fact that the study uses deductive reasoning to answer the research questions. Deductive reasoning is considered a logical process where numerous premises, entirely accepted as true or accredited true most of the time, are united to attain a particular conclusion (Cooper & Schindler, 2008).

Additionally, deductive reasoning stems from the positivist perspective where it is assumed that truth emanates from the five senses. If one cannot smell it, taste it, hear it, see it, or feel it, then it is not the truth (Popper & Miller, 1983). For example, participant's psychological constructs were measured via numerical values. As such, study findings represent the truth that exists during the course of the study.

A correlational ex post facto design were used to further guide the research. Correlational research is applied to test the association between the predictor variables and the dependent variable. At the same time, ex post facto denotes that the predictor variables will not be manipulated. Therefore, participants will not be allocated to a sugar group, (e.g., asked to consume a specific amount of sugar). Rather, sugar consumption were based on environmental/biological conditions; that is, participant's sugar consumption derives from biologic circumstance rather than random placement.

Definitions

Big Five Personality Traits: The five basic dimensions of personality traits are jointly considered a classification of character traits (DeYoung, Quilty, & Peterson, 2007). Based on the Big Five categorization model, individuals may respond to provocations or conduct in a specific way contingent on previous experience, economic situation, social value, health, as well as several other elements (DeYoung et al, 2007). The scopes of the Big Five personality model include Extraversion (E), whose qualities consist of friendliness, verbosity, and excitability; agreeableness (A), embraces kindness, loyalty, warmth, and the type of individual who is pleasant and easy to be around;

neuroticism (N), whose qualities include irritability, anxious, emotional instability, and the type of individuals who are easily stressed and depressed; conscientiousness (C), holds qualities for instance thoughtfulness, goal-directed, devoted, strong commitment for school and work, attentive to detail; and openness to experience; (O), whose qualities consist of insight, imagination, courageous to take a risk, and attention to the importance of long term success.

Daily Sugar Intake (DV): The AHA recommends limiting daily added sugar intake to 9 teaspoons (38 grams) for men, 6 teaspoons (25 grams) for women, 6 teaspoons (25 grams) for toddlers and teens in the age range of 2 and 18, and zero added sugars for children under the age of 2 (AHA, 2016; Vos et al., 2016). The National Institute of Health (NIH) has also issued sugar recommendations targeted to children among the ages of 4 and 8 to limit added sugar intake to a maximum of 3 teaspoons a day (12 grams), and children of age 9 and older to remain under 8 teaspoons (Vos et al., 2016).

Millennials: The term Millennials commonly denotes to the age group of individuals born between 1980 through 2000 (Howe & Strauss, 2000). However, the frequently referred inception scope for the population is 1982 through 2000. The Millennial age group is similarly referred to as the Generation Y, for the reason that it comes after Generation X which encompasses individuals born during the early 1960s through the early 1980s. Additional terms for this population include the Peter Pan or

Boomerang Generation due to tendencies for some to return to their parents' home because of economic limitations (Howe & Strauss, 2000).

Assumptions

There are several assumptions related to this study including truthfulness of respondents, proximal completion of survey questions, sufficient comprehension by respondents, and that bias does not affect interpretation of data.

It is assumed that each respondent provided truthful answers to each survey question and they responded to the survey at a single point in time. In effect, respondents were expected to complete the survey in one sitting rather than across days or weeks. It is assumed respondents understood that responses were strictly confidentiality, and as such, were not deterred from answering the survey truthfully. It is also assumed that researcher bias will not affect the outcome of the study.

Scope and Delimitations

The parameters under which the study were operating has been limited to Millennials, satisfying specific age inclusion criteria to diminish the effect of confounding variables. Additionally, the scope of the study has been limited to a quantitative process, which lowers the effect of researcher bias. Therefore, the prospect of researcher bias influencing findings is diminished. In conclusion, solely validated and reliable instruments are applied in the study. The intended strategy decreases the likelihood of measuring latent constructs that are not part of the study variables.

Limitations

Limitations of the research entail insufficiencies with respect to the sampling technique. Additionally, the use of inferential statistics presents limitations that include estimates of values measured in the population. Moreover, the type of statistical analysis that were applied also grants limitations. The study will guide a purposive sampling procedure that represents the application to withdraw a sample out of the Millennial population. The sample will consist of Millennials (via SurveyMonkey panels) that have agreed to complete a survey. As such, participants may not be fully focused on the meaning of the survey. This fact may in turn affect generalizability to the greater population of Millennials. Type Error 1 may exist for the reasons of the above noted limitations as a result of the application of the inferential statistics that will have consequence on the certainty of the study outcomes. Price and Oswald (2008) described that the presence of the Type 1 Error is a consequence of "a true null hypothesis rejected incorrectly" (p. 3). A Type 1 Error is the error of accepting an alternative hypothesis when the results can be attributed to chance.

In efforts of discoursing the constraints, the scope of significance is set at .05 (5%). In the circumstance where the significance level is assessed within .05, it is acknowledged that the study finding has a 5% (.05) of not being true and instead has a 95% chance of being true (Price & Oswald, 2008). In conclusion, correlational research is concerned with examining the nature of relationships between the interested variables and does not determine causality (Price & Oswald, 2008).

The variables of interest for the proposed research include Millennials sugar intake and the Big Five personality traits. Due to the nature of the variables, only correlation can be inferred from the results. The variables are nonexperimental variables, therefore cause and effect cannot be determined.

Significance of the Study

Practitioners in the health field could use the information gleaned from this study to align dietary recommendations with specific personality schemas. For example, individuals who are open to experiences (openness) may further be projected to ingest added sugars without fully weighing the consequences of their natural tendencies. Accordingly, health care workers could screen for the personality type and inform and train individuals about the long-term effects that added sugars may have on their health. Moreover, Millennials could use the information to recognize their own behaviors and adjust regularly to reduce the intake of added sugars. Finally, research could use the information from this study to build more complex models that might include specific gender or ethnic characteristics that would explain, to a greater degree, the antecedents of added sugar intake.

Importance for Social Change

Actions to reduce sugar intake across the whole population will have major advantageous effects on health along with major cost savings for our nation. The implications for positive social change include promotion and influence of quality of life. The study has the potential to be used within the health and nutrition field in effort to

help individuals reduce their consumption of sugar through the consideration as well as the relationship of the individuals' personality traits.

Summary

Within the U.S., most adults consume 22 teaspoons (355 calories) of sugar a day, still the recommended intake is only six teaspoons (100 calories) for adult women and nine teaspoons (150 calories) for men (AHA, 2016). Current research provides mounting evidence that too much sugar not only negatively affects a healthy weight but also heart health, brain health, and other conditions such as cancer (AHA, 2016). Understanding the best way to help people reduce the sugar dependency is paramount. A thorough review of the likely relationships between personality factors and sugar intake with regard to the associated detriments to health were presented in Chapter 2. Research methodology were presented in Chapter 3.

Chapter 2: A Review of the Literature

Introduction

Dietary factors, namely elevated sugar intake, have been recognized as a risk factors and indicators for progression of hypertension, high risk of obesity, metabolic syndrome, and Type II diabetes mellitus (AHA, 2016). The purpose of the study is to ascertain the correlation amongst the five basic dimensions of personality traits, including (a) openness, (b) conscientiousness, (c) extraversion, (d) agreeableness, and (e) neuroticism, and one's daily sugar intake exists.

There is an apparent gap in the present embodiment of literature concerning personality traits of Millennials and sugar intake. Personality traits have long been linked to eating disorders. However, majority of the research has been steered with regard to eating disorders and extreme personality traits. Eating disorders is a term used to describe a series of diagnoses such as anorexia nervosa, bulimia nervosa, and eating disorder not otherwise specified (Diagnostic and Statistical Manual of Mental Disorders, 2000). The noted ailments are thoroughly described in the DSM-IV (2000). Even with the intricate amount of research regarding personality characteristics, there is no evidence that research was conducted on personality traits and how they may relate to sugar intake. Therefore, there appears to be no research conducted on how an individual's five basic dimensions of personality traits including (a) openness, (b) conscientiousness, (c) extraversion, (d) agreeableness, and (e) neuroticism relate to daily sugar intake.

The review of the literature begins by discovering the theoretical foundation that supports this research. The health belief model and theory of planned behavior are used to explore the association among sugar intake and five-factor approach to personality analyses. By way of presentation of the theoretical structure, the evaluation advances the analysis of the physical and mental effects of obesity, and a consideration of obesogenic environments. Social, as well as cultural, factors connected to obesity, along with insights of health professionals' viewpoints, will also be examined. The chapter concludes with considerations of effective care models related to obesity and the necessary frameworks on which such care is to be expected.

Literature Search Strategy

The following list of databases and search engines were used to identify peer-reviewed journal articles, books, and dissertations, including U.S. government and private websites: Cochrane Database of Systematic Reviews; DARE; Dissertation and Theses at Walden University; eBook Collection (EBSCOhost); Google Scholar, and Medline. The following search terms were used: *sugar, big five, personality traits, sugar and health, sugar and diseases*. Other terms for the literature review search were: *Sugar related health conditions, sugar and the big five personality traits*. In an effort to expand the topic of the study, other terms used were *sugar industry, U. S. Federal guidelines and sugar intake, sugar consumption, sugar intake, Millennials and sugar.* The literature review comprised of peer-reviewed journal articles, books, as well as other sources of published data within 5 years of my expected dissertation study. The search was limited

temporally. The scope of the review of the literature in terms of years searched include the past 6 years but also reviewed available literature on the topic regardless of the timeframe conducted. With the overarching goal to integrate research outcomes, the review of the literature examined data about the research topic by including mostly high quality articles in the study. The Boote and Beile (2005) generated five-category rubric for evaluating a literature review was applied. The frequency and percentages of the resources such as peer-reviewed articles, books, and other sources are captured in Table 1.

Table 1

Frequency and Percentage of the Study Sources

	References			
Resources	Within 5 years	Older than 5 years	Total	%
Books	21	18	39	23%
Peer-reviewed articles	59	61	120	70%
Dissertations	0	0	0	0%
Other resources	10	1	11	7%
Total			170	100%

Theoretical Foundation

Research is framed in view of a certain perspective that, while composed through the complete proposition, makes sound and logical reasoning basis (Creswell, 2009). Even with the considerable number of theories available that could have been applied to report to the planned study, two theories best fit with regard to consumption of sugar as it relates to personality—the HBM and theory of planned behavior. The two theories offered the foundation for discovering Millennials personalities and their behaviors related to sugar consumption. The objective is to test the theories deductively, incorporate protection in contrast to bias, control for alternate explanations, and be able to generalize and reproduce the study findings (Creswell, 2009).

The Health Belief Model

The HBM was developed in 1950 and was first employed to explore why individuals do not follow preventive health measures (Hochbaum, 1958; Rosenstock, 1960). The HBM encompasses several key elements that define if and the reasons in which individuals react to avoid, distinguish, as well as manage ailments. The key constructs of the theory include: perceived susceptibility, perceived severity, perceived benefits, barriers to engaging in a behavior, cues to action, and self-efficacy (Glanz, Rimer, & Viswanath, 2015).

Orji, Vassileva, and Mandryk (2012) explained that the success of the HBM remains limited due to its low predictive capability ($R^2 < 0.21$ on average). Orji et al. identified limitations of the model by suggesting four new variables: self-identity,

perceived importance, consideration of future consequence, and concern for appearance. Orji et al. surmised that the four new variables were conceivable determinants of healthy behavior. Orji et al. tested the validity of both the proposed extended model and the original HBM on healthy eating behavior. Their study results indicated that the added determinants improved the predictors of healthy behavior by 78% in comparison to the old model (Orji et al., 2012).

The HBM has remained one of the most commonly used conceptual frameworks within health behavior research since 1950 (Glanz et al., 2015). The model is used to explain change of health-related behaviors as well as a guiding framework for interventions (Glanz et al., 2015). The use of the HBM is particularly popular in community-based interventions (Glanz et al., 2015). The constructs of the HBM model are comparatively simply defined and correlated to real-life experiences (Glanz et al., 2015). The advantage of the HBM model is that the model lends itself to assessing relationships at the individual level. For example, "when people do not perceive benefits to a particular action, the interventions pursue to reinforce their awareness of benefits" (Glanz et al, 2015, p. 89). Interventions based on the HBM may present cues to remind and encourage individuals to engage in health promoting behaviors.

Additional strengths of the HBM are cultural issues that generally translate into notions of barriers and susceptibility as well as taking individual's perceptions and beliefs into account rather than relying on global measures (Riekert, Ockene, & Pbert, 2013). The model's weakness is noted in the assumptions, which may not be valid for all

populations, such as those enjoying good health. For example, individuals that enjoy good health may not find some of the antecedents of healthy behavior to be of high priority or hold high value, or may not feel that healthy behavior is under an individual's control (Riekert et al., 2013).

Theory of Planned Behavior

During 1991, Ajzen presented the theory of planned behavior (TPB) in a manner that improved the original theory of reasoned action (TRA) established in the mid-1970's along with his colleague Fishbein (Fishbein & Ajzen, 1975). The TRA remained grounded on cognitive and behavioral characteristics but also offered a guideline to comprehend part of the greater rudimentary reasoning within several behaviors (Fishbein & Ajzen, 1975). Additionally, the TRA offered how to modify the behaviors through time but lacked interpretation for the awareness of individuals possessing comprehensive control of particular behaviors and a wish to enact a transformation (Ajzen, 1991). The TPB was enhanced to incorporate intention (Ajzen, 1991). For instance, intent or perceived intent is a component with substantial influence on an individual's motivation and influence and therefore is a relatively significant gauge of how expected an individual is ready to attempt and facilitate a positive behavioral transformation (Ajzen, 1991, p. 181). The TPB is distinguished from the TRA through Ajzen's (1991) viewpoint due to the addition of intent as well as "perceived behavioral control" that prevails as a measure of the extent an individual believes they can participate in the behavioral modification and produce an effective result (p. 183). The TRA shaped the foundation

and the TPB extended to encompass the significant component of perceived behavioral control.

Near the root of the TPB is the notion of planned behavior in view of the outcome of an individual's intent to essentially carry out the conduct. Specifically, an individual's objective to carry on a transformation including their intent is based upon their acceptance about their capability to command the result of the modifications (Ajzen, 1991). Consequently, intent is considered the core of the TPB. Additionally, intent is considered a reflection of motivation in reach of an individual to carry out the changes and at that time together are immersed in the individuals' acceptance that they possess control over themselves, and the modification they demand to carry out (Courneya et al., 2002). Remarkably, within Ajzen's (1991) presentation of the TPB, Ajzen formed detailed reminder that although the blend of perceived behavioral restrain and intent remained commonly virtuous interpreters of a person forming encouraging behavioral transformations, they were minimally considered an interpreter for a person's assurance to adept (r = .44, p = 0.09). Ajzen discovered this fascinating in view that for an individual to lose weight it is essential that the individual strongly believes they can not only attain the desired result but also that they have the capability to do so.

Pickett et al. (2012) applied the TPB in effort to observe conducts of disordered eating, together with binge eating, as well as body image misrepresentations among 404 college scholars attending the University of Texas. The researchers discovered significant statistical results from the correspondence connecting the "attitude, subjective norm, and

the perceived behavioral control" of member contributors [$F(3, 395) = 95.678$, $p < .001$)] after searching to describe conduct adjustment among eating disordered individuals (p. 348). Likewise, the researchers determined intention as a suggestive probability for conduct [$F(1, 401) = 107.340$, $p = .001$] (p. 349) and also determined through the study outcomes the assessment of the TPB as an insufficient model to conclude weight reduction or foresee conduct modifications for purposes of health were inaccurate and TPB remained a genuinely exceptional indicator for modification of conduct in consideration of intent (Pickett et al., 2012).

Lastly, the TPB consists of three fundamental principles a person has developed throughout time that enabled to create conducts regarding himself or the rest (Courneya et al., 2002). The particular principles ought to be willingly presented and pursue three key basics described in the TPB including behavioral beliefs, normative beliefs, and control beliefs (Courneya et al., 2002). In effort for a person to accomplish a transformation within their conduct, they should foremost believe they can see to the behavior in a correct way (behavioral belief) (Courneya et al., 2002). Additionally, it is imperative that the individual regards the behavior as one that individuals close to the person also regard as normal (normative belief) (Courneya et al., 2002). In closure, it is essential that the individual realize they remain in ownership of necessary properties and possess prospects towards a desired outcome (control belief) (Courneya et al., 2002).

Courneya et al., (2002) studied an association of cancer survivors and concluded that when examining beliefs and personality traits, beliefs established the probability of

an individual to carry out daily repetitive exercises in effort to maintain a healthy body and survive cancer. The researchers evaluated beliefs by means of studying behavior beliefs, normative beliefs, and control beliefs where behavioral beliefs, in cooperation with control beliefs, identified a level of significance that the individuals remained further inclined to essentially achieve a routine exercise driver in consort with intent to achieve the habit of dietary food changes (r = .31, p = .041) (Courneya et al., 2002). Additionally, the researchers revealed personality qualities of extraversion (M = 25.79, SD = 6.13, p = .250) in addition to qualities of conscientiousness (M = 32.48, SD = 6.27, p = .128) having a higher probability to become acknowledged by the individual envisioned to conduct the actions in comparison to individuals with neurotic disposition qualities that appeared not as probable to acknowledge the benefit from the desired behavioral change (Courneya et al., 2002). Perceived success was more important in understanding the attribution process to influence expected success.

Literature Review Related to Key Variables and/or Concepts

The following literature was reviewed for this study:

Five-Factor Model of Personality

Even with the powerful composition of studies researching obesity and mental health disorders, an apparent gap in research exists to identify the relationship between personalities of Millennials (openness, conscientiousness, extraversion, agreeableness, and neuroticism), and their sugar intake. The comprehensive inquiry seeks to determine if the personality of the individual supports their probability to consume sugar.

The five-factor approach (FFM) to personality traits is grounded on efforts by Costa and McCrae as of 1985, which built upon previous personality trait efforts including advanced five scopes of personality (Digman, 1990). The trait based theory evaluates behavior as a straightforward reflection of an individual's personality traits in addition that traits are commonly measured to be correct accounts of human nature congruent throughout time (Courneya et al., 2002).

Consequent to the presentation of the FFM, McCrae and John (1992) accredited that even though the FFM may be a partial theory of personality, in response to opposition by peers, the model embraces consistency with regard to trait explanations throughout languages and follow through time from childhood to adulthood. Additionally, Costa and McCrae (1992) made the distinction among personality traits as variances among individuals in the manner they acknowledge their though process, their conducts, as well as their demonstrative insights concerning the rest of the population. The researchers pronounced the FFM as a complete and "comprehensive taxonomy of personality traits" apparent invariably throughout time, culture, age, and ethnicity (McCrae & Costa, 1992, p. 344). The rudimentary five scopes of personality comprised in the study are neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness (McCrae & Costa, 1992, p. 367).

Personality traits hold a paramount impact over an individual's personal life including behavior conducts and therefore must fundamentally be evaluated for positioning and transformation of treatment intent and purpose (McCrae & Costa, 1992,

p. 367). The identified traits can support an understanding of an individual with regard to their "emotional, experiential, interpersonal, and motivational styles" whereby effectively offering an educational professional pertinent information to comprehend the client, help assist them the best way possible, and may also permit a quick formation of empathy and therapeutic bonding (McCrae & Costa, 1992, p. 369). Understanding how personality traits relate to sugar intake in Millennials is just as important as understanding the personality characteristics that may improve identification of an underlying issue that has yet to be understood.

Intrinsic to the five-factor standard of personality traits, a number of traits are associated with how an individual observes their personal health and welfare and the way they attain good health and prevent illness. Nevertheless, two main traits were acknowledged to have further substantial bearing on the identified health behaviors compared to others, predominantly with respect to weight. These traits recognized are conscientiousness and neuroticism (Sutin, Ferrucci, Zonderman, & Terracciano, 2011). For instance, people that attain a high score with regard to the quality of conscientiousness have a tendency to be leaner and participate in improved healthy options. As a result of their inclination to have more organization and order accompanied by self-discipline, a healthy weight is also supported in addition to improved lifestyle options (Sutin et al., 2011).

In comparison, people who attain a high score with regard to the trait of neuroticism have a tendency to be chaotic throughout several parts of their life including

their health. Sutin et al. (2011) explained that as a result of the higher level of pessimism, the individuals' score in neuroticism tended to maintain this behavior throughout all parts of their lives. Weight is considered one of the advanced disordered states with individuals who score high in neuroticism (Sutin et al., 2011). In theory, Sutin et al. (2011) highlighted that this is attributable to unwholesome eating behaviors and more sedentary lifestyle choices.

In review of figures out of a 50-year longitudinal study, Sutin et al. (2011) concluded that overweight and obese individual contributors inclined to score high in

> impulsiveness, assertiveness, excitement seeking, anger, hostility, activity, and self-consciousness when compared to participants of normal weights and obese women scored significantly higher on both depression ($F(2, 1957) = 2.45$, $p < .05$) and self-consciousness ($F(2, 1957) = 3.60$, $p < .05$) with overweight men scoring higher in anger and hostility ($F(2, 1957) = 3.57$, $p < .05$) than normal weight men (p. 8).

In addition, Sutin et al. identified associations with elevated impulsiveness and reduced self-control to be traits that steadily designated elevated weight analyses. The researchers credited the study results to individuals possessing traits conflicting to resist temptation (like sugar) and implementing the control necessary to sustain a fit weight. Therefore, the identified people were consistently more probable to participate in further conducts that advance the hazards to their mortality including "binge eating, being physically inactive, smoking, drinking, and abusing drugs" (Sutin et al., 2011, p. 11).

As a result of the investigation of the participants in the longitudinal study by Sutin et al. (2011), the researchers determined the presence of substantial psychological and social burdens for the individuals in the range of obesity. Moreover, the researchers determined sound correlation among negative personality traits connected with neuroticism and heightened probability of disordered weight management. Fundamentally, clients in search of therapy intervention that may possess negative personality traits could profit from treatment by attaining assistance to recognize motivations and obstacles and as a consequence manage each respectively in effort to have favorable results from therapy (Sutin et al., 2011).

Stone and Pangborn (1990) examined preferences and intake measures of salt and sugar in relation to personality traits. Factors influencing eating behavior include innate regulatory mechanisms indicating personality traits (i.e., sensation seeking). The individual differences noted in the study with regards to the preference of sugar and salt should be consistent in the youth as they are apparent in adults (Stone & Pangborn, 1990). Present day daily sugar intakes by the youth exceed the recommended daily sugar intake (Johnson et al., 2009). Mennella, Finkbeiner, Lipchock, Hwang, and Reed (2014) examined preferences for salty and sweet tastes in the youth and study results reveal that children prefer higher levels of sweets which in turn makes them vulnerable to the modern diet. The authors highlight that complying with recommendations to reduce daily sugar intake may be more challenging for some and reinforces the need for novel approaches to improve their diet.

Relationship between Sugar and Weight

Ogden et al. (2012) highlight that within the United States, every two out of three adults and one out of three children are measured as overweight or obese. Additionally, the country expends approximately $190 billion annually to treat obesity associated health circumstances (Flegal et al., 2012).

The growing consumption of sugary drinks has been the most important cause for the obesity epidemic (Cawley & Meyerhoefer, 2012). A representative 20-ounce soda drink encompasses 15 to 18 teaspoons of sugar and generally more than 240 calories. While a 64-ounce fountain cola drink has the potential to have approximately 700 calories (U.S. Department of Agriculture, 2012). Individuals whose diets comprise of this "liquid candy" in turn do not feel satisfied or as full compared to individuals that may have eaten the same calories from solid food (Pan & Hu, 2011).

Beverage firms in the United States paid an estimated $3.2 billion in marketing their carbonated beverages in 2006, with approximately a half billion dollars of that broadcasting intended directly at youth ages 2–17 (U.S. Federal Trade Commission, 2008). Every year, youth in the United States view hundreds of television advertisements for sugar-containing drinks. During 2010, for instance, preschoolers observed an average of 213 advertisements for sugary drinks including energy drinks, whereas children and teens viewed an average of 277 and 406 advertisements, correspondingly (Harris et al., 2014). Thus far, the beverage industry destructively rejects recommendations that its products and selling strategies play any role in the obesity epidemic (The New York

Daily News, 2012). In accumulation to the misperception, beverage industry-funded research are four to eight times more probable to show results advantageous to industry than independently-funded studies (Lesser, Ebbeling, Goozner, Wypij, & Ludwig, 2007).

A study conducted over a series of 20 years on 120,000 male and female participants established that individuals who amplified their sugary drink intake by one 12-ounce serving per day increased in more weight over time, an additional pound every 4 years in comparison to individuals who did not alter their intake (Mozaffarian, Hao, Rimm, Willett, & Hu, 2011). Additional research shows a substantial association among sugary drink intake and weight gain in youth (Malik, Willett, & Hu, 2009). One study results show that for each added 12-ounce soda children consumed each day, the probability of becoming obese amplified by 60% during 1½ years of follow-up (Malik et al., 2010).

The Mental and Physical Effects of Obesity

Obesity has remained unmistakably connected to numerous mental health disorders, predominantly mood disorders serving as depression and anxiety (Lin et al., 2013; Simon et al., 2006). Additionally, obesity is categorically associated with noteworthy health conditions including diabetes, hypertension, stroke, and heart disease (WHO, 2013; Lin et al., 2013; Ma & Xiao, 2010). Obese persons are beyond probable to sense persistent depression and consider their size as an apparent prompt of their particular letdown to accomplish health and prosperity. In turn, obesity could confer to the regard that the person is deprived of self-control, impulse control, and organization

(Sutin et al., 2011). More specifically, women are subject to be more obese than males, and predominantly obese individuals have deprived mental health with death rates 2.5 times higher compared to individuals with normal weight deprived of mental health concerns (Stanley, Laugharne, Addis, & Sherwood, 2013).

During 2005 Friedman et al., examined 93 obese adults in an order to identify connotations among obesity, negative stigmatization, and mental health disorders. Exploration of the data generated an understanding that it is conceivably the stigma that sources the utmost harm to an obese individual's psyche where 98% of contributors described undesirable comments from personal family members, 97% reported entree restrictions to community settings because of their weight, 89% in receipt of exceedingly negative comments from outsiders, and 89% describing in receipt of undesirable comments from their principal health care physicians (Friedman et al., 2005). In summary, Friedman et al. (2005), concluded that the study results had principal significance [$F(7,85) = 7.11$, $p < 0.001$] with contributors that continuously conveyed negative experiences ($b = 0.37$, $p < 0.001$) together with progressively more antifat attitudes of others ($b = -0.27$, $p = 0.004$) significantly subsidized to difficulties with body image disorders ($b = -0.19$, $p = 0.047$) among the surveyed individuals.

Obesity is attaining considerable acknowledgement as a public health predicament demanding reaction (Fetter & Koch, 2009). The World Health Organization (WHO) formally acknowledged obesity as a global epidemic in 2009 and more recently in 2013 projected that globally obesity rates would duplicate up to 35% (WHO, 2013). In

other words, 1.4 billion adults above age 20 are reported as overweight and 11% are reported to cross the BMI index to obesity (WHO, 2013). The principal populace of obese individuals is located in America (62% overweight, 26% obese) and the lowermost individuals located in South East Asia (14% overweight, 3% obese) and in 2011, 40 million children below age 5 globally were considered overweight or obese (WHO, 2013). On the other hand, there is the perspective of individuals who advocate the relevance of the term "epidemic" to define the cumulative masses of the planet's inhabitants as purely "a trigger" term to place obesity into the dominion of a social complication instead of an individual health concern (Patterson & Johnston, 2012). Additionally, to acquaint obesity with a failure of society in general together with prospect of infectious outbreaks of excess and indolence and the supplementary consequence that obesity may perhaps "overtake 9/11 in terms of human suffering" are all part of a media campaign instead of an accurate determination of acknowledgement the genuineness and the substantial result of being overweight or obese withholds (Patterson & Johnston, 2012).

In the U.S., obesity has for the time being passed smoking as the top reason for chronic health complaints and early death (Maryon-Davis, 2005). The effect of a five-part intervention confirmed justly effective in physician's treating their patients and ending smoking. During 2011, Alexander et al., assessed physician application of the Five A's as a treatment procedure for obese patients. The five A's were identified as: Ask, Advise, Assess, Assist, and Arrange. The method is straightforwardly tailored for treating patients

requiring to lose weight, though, in examining data from 40 contributing physicians including 461 patients, Alexander et al. (2011) discovered even though physicians characteristically asked (77%) and advised (63%), they infrequently assessed (13%), assisted (5%) or arranged (4%) additional involvement for the identified obese patients. Nevertheless, it is not evident if any reimbursements are derivative from working in a treatment setting to support an individual to lose weight. However, there is indication of a robust association among obesity and mental health diagnoses.

Obesity including binge eating disorders are certainly connected with heightened incidents of depression, suicide, low self-esteem, infertility, as well as malnutrition (Tallyrand, 2006). A connection between obesity and mental health disorders is apparent, inclusive of obesity positively associated with "major depressive disorder (OR 1.21; 95% CI, 1.09-1.35); bipolar disorder (OR 1.47; 95% CI, 1.12-1.93), as well as panic disorder and agoraphobia (OR 1.27, 95% CI, 1.01-1.60) (Simon et al., 2006). Fabricatore and Wadden (2003) proposed that attending to psychological distress of obese individuals may perhaps initiate a boost in mood and reduce the emotional state of stress with the intention to improve the client's aptitude and generate essential behavioral transformations that possibly will result in less sugar intake and successive weight loss. Substantial advancements to an individual's physical and mental health could be identified in clients who reduce their body weight by only 5-10% (Maryon-Davis, 2005).

It is imperative to indicate that medications used psychotherapeutically to assist reduce depressive symptoms, decrease psychotic episodes, and alleviate mood and

behavior are strongly connected with weight gain over a period of time, including medications that may well at first cause weight loss (Stanley et al., 2013). Therapists are educated to counsel individuals and families to handle stressors within their setting that may outcome in mental health complications including anxiety and depression, both of which have been associated with being overweight/obese (Fabricatore & Wadden, 2003). Therefore, the acknowledged professionals are distinctively trained to support the same clients realize and discover both psychological and social prompts to behavior that may have a negative consequence on their general health and well-being (Fetter & Koch, 2009).

Granello (2000) acknowledged numerous tools counselors might apply to administer wellness focused treatment for clients. The tools encompassed "cognitive behavioral interventions as well as change techniques accompanied by relaxation, stress management, and social skill training." Sharma and Padwal (2010) suggested the tools to consist of exploring the conduct of food choices as well as eating, examining thoughts that go into self-control, the individual's self-confidence, incentive to change, possible experiences of judgement and negative stigma from others, including how these elements may subsidize progression of depression or anxiety disorders. According to Karasu (2012), even though various psychological factors require to be addressed when treating an obese patient, health care providers should not concentrate solely on an individual aspect of obesity, i.e. all physiological or all psychological aspects should be considered. Additionally, Karasu (2012) suggests for physicians to assume to endorse any important

modification in the weight of their patients, through thorough examination of the patient holistically (i.e., psychological traits) (p. 125).

According to Ma and Xiao (2010), depression and obesity are considered ailments that are definitely associated with other chronic illnesses including heart disease and diabetes. Individuals with mental health illnesses are at a heightened risk of becoming overweight/obese attributable to medication use (Taylor et al., 2012). Consequently, Devlin et al. (2000) emphasize that weight, and the antecedents of weight, must be addressed promptly as a segment of therapeutic treatment and possibly also irrespective of the presence of an identified co-occurring illness. Lin et al. (2013) highlights that the connection among psychological distress and obesity is considered bilateral, predominantly with regards to depression. Depression declines motivation and energy while medication increases appetite. Moreover, depression gives rise to a diminished level of attention to wellness and prosperity. Consequently, Lin et al. (2013) underlines that treatment must consist of guidance with the incorporation of healthy living and healthy weight management for patients in search of treatment for depression.

Obesogenic Environment

The environment is of paramount importance to an individual's weight in that the modern-day setting comprised of fast food and an inactive way of life is considered an "*obesogenic environment"* (Boehmer, Lovegreen, Haire-Joshu, & Brownson, 2006). In effort to encourage a positive behavioral modification, experts must consider cultural,

social, and economic factors that provision the obesogenic environment of the affected individual (Karasu, 2012; Maryon-Davis, 2005).

Income, recreational opportunities, vocation choices, restaurant availability, social interaction venues, habits and beliefs of the leading race in the community, as well as food choices restricted by income when dining out are a few social and cultural elements at the core of an individual's environment that reinforces obesity (Sharma & Padwal, 2010). In consideration of the low SES residents including their prospect of obesity, the supplement nutrition system similarly has an important responsibility in sustaining an obesogenic environment (Patterson & Johnston, 2012, p. 274). Paterson and Johnston (2012) emphasize that the distribution of poor quality and low nutrition valuable diets to the underprivileged populace remains to provide the association among "poverty, malnutrition, and excessive body fat" (p. 274). The British physiologist and nutritionist John Yudkin explains in *Pure, White, and Deadly*, refined sugar is a substance for which your body has "no physiological requirement" (Yudkin & Lustig, 2013).

Environment likewise incorporates the physician's office including the office staff. Physicians must attempt to circumvent generating an obesogenic environment within their setting through consideration of the physical atmosphere including the proportions of the furniture, entryways, restroom stands, and even the types of physiques presented on publication covers within the seating areas (Davis-Coelho, Waltz, & Davis-Coelho, 2000). According to Bean, Stewart, and Olbrisch (2008), physicians should take

into account furniture proportions and facility extents so that the setting is not discriminating to obese patients and further stigmatizes the patients (p. 221).

Additionally, Bean et al. (2008) emphasize that psychological offices in particular along with their staff must be made available with opportunities for sensitivity training so that their individual level of responsiveness is raised with regards to their treatment and conduct toward obese patients who require constructive help as well as encouragement instead of harboring negative stigma and judgment based on weight (p. 221).

Obesogenic environments have been noted to be established and sustained among the individual's home as well as neighborhood. A recent study observed the association among childhood obesity and neighborhood location (Saelens et al., 2012). Within the representation including 730 families, the association among obese children and obese parents was initially examined (Saelens et al., 2012). The study results showed a significant correlation among the BMI of the child and the parent groupings ($r = 0.33$; $p = < 0.001$) discovering 35.1% of heavy parents having heavy children (OR = 2.64, 95%CI = 1.83, 3.86; $p = < 0.001$) and 23.2% of obese parents having obese children (OR = 3.36, 95% CI = 2.06, 5.48; $p = < 0.001$) (Saelens et al., 2012, p. 4).

Moreover, the study findings support the hypothesis that an environment occupied in healthy routines, with available healthy food options and improved prospects for physical behaviors would demonstrate a lower number of overweight or obese children ($x^2 = 3.89$, df = 1, $p = 0.049$) (Saelens et al., 2012, p. 5). However, the provision could not adhere to the parents of the children. The indicated findings would in turn reinforce the

notion that an individual's environment and location has a substantial influence on weight where regions tailored in the direction of healthy activities retain a reduced percentage of overweight and obese residents when compared to other regions where way of life is not a vital factor among residents (Saelens et al., 2012, p. 5). Consequently, this could be principally challenging for the individuals that reside in provincial regions instead of vastly developed settings.

Boehmer et al. (2006) studied 13 groups around Missouri, Tennessee, and Arkansas and surveyed above 2210 participants with regard to their area, their weight, as well as the availability of recreation activities and promotion of healthy living. The study outcomes propose obesity is elevated in provincial groups (27%) compared with national evaluations (23%) (Boehmer et al., 2006). Moreover, study findings suggest that provincial inhabitants are less probable to partake in leisurely healthy activities as a result of their distance and the absence of readily available accommodations within their respective environment (Boehmer et al., 2006, p. 419). In general, the study facilitated the idea that neighborhood settings may influence weight and the deficiency of satisfactory conveniences to participate in a healthy way of life as well as opportunities can support an obesogenic environment frequently noted among provincial groups.

Finally, it is imperative that physicians understand that customarily the individual's family is the main indicator of an obesogenic environment. Zeller et al. (2007) surveyed relatives of 78 young obese children and concluded a significant relationship ($p < 0.01$) among the BMI of children and of parents, the relevant mealtime

challenges, mother's psychological stress, including complex points of family struggle (Zeller et al., 2007, p. 126). Additionally, Zeller et al. (2007) identified through study results that obese young children including children requiring psychological treatment may have important influences contributing to the distress inside their household and while one might want to change their circumstances, the influence of the family atmosphere can be actually challenging to alter.

Cultural Perspectives and Social Prejudices of Obesity

Historically, obesity on one occasion designated rank and wealth, nevertheless, modern culture interprets obesity as an important public health emergency (Sutin et al., 2011). Acknowledgement of obesity as a noteworthy health issue is not considered novel. In 1952 the American Heart Association (AHA) made available their initial documents acknowledging obesity as a serious health hazard to an individual's heart and emphasized that it could be overturned by means of healthy eating and an active lifestyle (Harvard, 1952). Nestle and Jacobson (2000) highlight that during 1974, focus was directed towards waistlines considering the global increase in waistlines, yet, following 40 years obesity endures as a continuing concern that has perceived defeat. The World Health Organization (2013) emphasizes that obesity is a preventable and an amenable disease that is simply distinguished but tremendously challenging to treat.

Caldwell, Baime, and Wolever (2012) highlight that during the previous 2 decades, obesity rates in the United States as well as globally have been growing persistently and it accounts for two main factors including a person's behavior and a

person's environment at the root of the problem. Attention to weight control and healthy behaviors are similarly growing considering the numerous experts in the health sector requested to address issues with regards to weight control (Tsai et al., 2010). The U.S. directive from the Preventative Services Taskforce (USPST) (2003) presents suggestions for all providers to investigate adult patients to ascertain obesity and to then advise a concise course of action if at risk of becoming obese. However, there is an enduring misunderstanding derived from the mandate which is centered on the question of who is actually responsible for the discussions, the physician or the health expert. In each professional field identified, personal characteristics and point of view towards obesity along with its origin may present a crucial bearing on the professional's disposition to guide the interventions associated with obesity.

Puhl and Heuer (2010) emphasize that stigma and segregation for obese individuals is a common problem that creates further health issues to mental health and physical wellbeing. According to Lin et al. (2013), even though females are more prone to consider counseling to attain support compared to males, they are more likely to express consequences of obesity including depression, stress, low self-esteem, anxiety, and endomorphic.

Wadden, Foster, and Brownell (2002) indicate that obesity rates are particularly high in the presence of individuals with low income. Females and female minorities are predominantly identified among the low socioeconomic status group (SES) (Wadden et al., 2002). According to Tallyrand (2006), African-American females have the highest

incidence for the abovementioned concerns including a 77.35 risk for obesity in the U.S., the greatest risk at present. Tallyrand (2006) continues to add that the American standard illustrates being “thin to be beautiful” as an accepted culture liable for most disorders among women within the U.S. in respect to weight and body. The females that are represented within the low SES group may use food, especially sugar, to make up for other weaknesses such as stress (Tallyrand, 2006). Additionally, Tallyrand (2006) highlights that these women use food to ease the grief of inferior emotional control as a result of the consistent state of being poor including their affinity to coddle in elevated sugar and peak fat diets when reviewed against women represented in higher SES brackets.

Perspectives within the Medical and Mental Health Professions

Karasu (2012) highlights that medical health professionals generally direct attention to assess obesity consequent to inadequate conducts with respect to their health and therefore avert obligation to professionals within the field of mental health. Quite the contrary, professionals within the mental health field interpret that accountability must lie within physicians within the medical field as they consider obesity a health related issue (Karasu, 2012). Sharma and Padwal (2010) present that in the past, the model treatment for obese patients by the medical professional was to educate the patient to incorporate exercise and eat less. Sharma and Padwal (2010) further emphasize that the above mentioned treatment applied historically is ineffective in treating obesity.

Perpetuating treatment for obesity within the field of mental health may permit a superior understanding and enhancement within the social and cultural inspirations, biomedical issues, mental health, use of medication (Sharma & Padwal, 2010). Kraschnewski, Sciamanna, Pollak, Stuckey, and Sherwood (2013) examined a survey that showed even with the presence of a standard made available to health care providers, compliance with the guideline indicated low scores for primary care physician (PCP) reporting rates under 6%. The low compliance proportion was identified by Kraschnewski et al. (2013) attributable to physician's lack of time, the characteristic notion that obese individuals will not alter their behavior regardless of the physician's involvement, and lack of training in counseling. The aforementioned viewpoints constrain proper intervention and fail to support the patient.

According to Puhl and Brownwell (2001), professionals within the mental health field as well as the health care field may maintain an unfavorable position with regards to obese individuals. Olah, Gaisano, and Hwang (2013) further support that professionals and staff may feel negatively with respect to obese patients and their treatment. Sharma and Padwal (2010) point to professionals in the healthcare field and their general consideration of obesity as a direct influence of inadequate life options and conducts instead of diagnosing the disorders that may be associated to obesity such as mental health. Fryhofer (2013) highlights that obesity is an endorsed diagnostic code within the International Classification of Diseases, particularly defined in both the ICD-9-CM and the ICD-10-CM. According to Fryhofer (2013), the American Medical Association

(AMA) nevertheless, suspends to authoritatively classify obesity recognized as a disease under the divided notion if obesity should be considered a diseases based on remaining inquiries connecting obesity with morbidity or mortality. Fryhofer (2013) also indicates that the AMA is reluctant to untimely categorize obesity a disease for the reason that the classification would render an estimate 1/3 of the American population on the record as ill and in turn could cause more harm for the distant future. However, the preceding standing is contrary among AMA that recommend tagging obesity as a disease to further research as well as available treatment opportunities similarly diminishing adverse stigma related to obesity (Fryhofer, 2013).

Dr. Lustig, a practicing pediatric endocrinologist and professor of clinical pediatrics at the University of California, San Francisco refers to sugar as poison (Lustig, Schmidt, & Brindis, 2012). Lustig et al. (2012) highlight that the UN declaration marks tobacco, alcohol, and diet as the fundamental risk factors in noncommunicable disease where alcohol and tobacco are regulated leaving the principal culprit behind schedule. PCPs that may initially distinguish the patient's weight as a crucial issue at stake of disorders such as mental and medical health were short of recommendations for behavioral intervention and therapy that may possible support the individuals (Sharma & Padwal, 2010). Comprehensive indication suggests psychological interpositions as beneficial not only for the individual's physical challenges related to obesity but also with regard to the patient's persistent and consequent mental health problems (Baron, Lattie, Jo, & Mohr, 2013). Baron et al. (2013) indicate the apparent comprehensive

treatment required to include not only the person's behaviors but also their health through the establishment of partnerships within the provider community in effort to provide a holistic approach to the treatment. Incorporation of the medical and mental health fields when treating an obese individual is imperative for the reason that chronic diseases categorically become worse with time (Saltz, 2015).

Caldwell et al. (2012) suggest for clinicians that work with clients who are obese to first identify with their approach and claimed beliefs with regards to excessive weight considering negativity which can have an inadequate influence on diagnosis and treatment. Crandall (1994) studied anti-fat approaches and proposed that pessimistic beliefs with regard to an individual's excess weight represents a type of prejudice and can in turn simulate racism and concludes the "overt, expressible, and widely held" discernment (p. 891). The perception of individuals with excess weight is that of lazy, deficient in restraint and for this reason these individuals are frequently distinguished against based on weight. Consequently, psychological schemas may develop that prove detrimental to the health and wellbeing of the obese person.

Negative attitudes and stigmatization of obese persons are blatant among the general population encompassing that obese persons are lazy, ugly, more depressed, and sloppy (Pantenburg et al., 2012). Additionally, many professional health providers account conclusions that obese individuals are not as expected to react to treatment and more expected to generate further tasks at hand for the expert because of their propensity for dissent (Schwartz, O'Neal-Chambliss, Brownell, Blair, & Billington, 2003).

Teachman and Brownwell (2001) investigated negative beliefs toward individuals with excess weight and the prevalence of these attitudes among the field of health professionals. Study conclusions discovered that experts in the field hold sound pessimistic connotation towards individuals with excess weight (Teachman & Brownwell, 2011). However, due to the nature of their work to serve troubled individuals experts support obese individuals in turn reducing the bias towards the identified population (Pantenburg et al., 2012; Schwartz et al., 2002; Teachman & Brownell, 2001).

The disapproval is not only apparent with the disease but also on the individual with excess weight who is somehow considered to be astray causing an uncommon bearing in society that worships thinness and outlies obese individuals (Schwartz et al., 2002; Teachman & Brownwell, 2001). The perceived passive bias within the health care field has directed submissions by the American Psychological Association that specialists in turn expand their attempt to recognize and address psychological issues associated with obesity (APA, 1992).

Several philosophies with regard to health consciousness including health performances are created in phases of the transformation approach that suggests individuals transfer over several discrete thought processes prior to becoming completely prepared to conduct a form of transformation (Webb & Sheeran 2006). Consequently, health belief systems including health considerations lean towards this similar path. Professionals who distinguish the unique dynamics manifested by each person are further vested towards the willingness to freely discuss with their patients the prerequisite to

examine their well-being and contemplate particular interactive modifications that would essentially guide improvement in health (Orr, Thrush, & Plaut, 2013). Preferably, professionals should attempt to set an example to their clients with respect to sustaining an organic weight and improving activities that support a healthy lifestyle (Bleich, Bennett, Gudzune, & Cooper, 2012).

Summary and Conclusions

The most profound reasons for death in the United States as well as globally are chronic diseases that include heart diseases, cancer, and diabetes (Lozano et al., 2012). Behavioral factors, particularly with regard to diet and activity are considered the greatest contributors to mortality (Fisher et al., 2011). A diet high in sugar has been identified to cause chronic health conditions including heart disease, obesity, inflammation, neuropathy, arthritis, and cancer. People's lifestyles and their ability to choose healthy habits are greatly influenced by their cognitive dispositions (Florindo, Salvador, & Reis, 2013).

A series of robust studies point to obesity and its association to mental health disorders, however there were no studies that examined the association between personality traits (openness, conscientiousness, extraversion, agreeableness, and neuroticism) of Millennials and their sugar intake. Therefore, the main inquiry for the proposed study is do Millennials personality traits affect their probability to consume high sugar?

The following chapter 3 will introduce the study design and the precedent for study participants that were carefully chosen for participation, fundamental demographics of the designated population, study instrumentations to be applied, as well as approaches for operation of statistical examination. Additionally, chapter 3 advances the dialogue about methodological assumptions formed and also defines several threats to internal validity and external validity. In conclusion, the subsequent chapter will consider the degree to which the study results can be generalized to and through populations and settings.

Chapter 3: Research Method

Introduction

Individuals who consumed 25% more sugar than the national average were twice as likely to die from heart disease as those whose diets included less than 10% added sugars. Through examination of data within the Continuing Survey of Food Intakes by Individuals (CSFII) 1994–96, it was established that individuals participating in the Food Stamp Program were likely to consume added sugars, as well as total fats and meats, but not healthy options such as fruits, vegetables, grains, or dairy products (Guthrie & Smallwood, 2003; Wilde et al., 2000).

Recent 2016 dietary recommendations aimed to reduce the average American's sugar consumption by half due to the negative health effect of sugar. The U.S. Department of Health and Human Services and U.S. Department of Agriculture (2015) professed added sugars in diets must be restricted to under 10% of regular caloric consumption. A diet high in sugar is linked to increased blood pressure and stimulation of the liver releasing additional unsafe fats into the blood stream (AHA, 2016). Taking into consideration the most recent correlations related to nutrition, including the heightened societal burden and cost of their consequences, diet transformations are immediately requisite of attention.

Problem Statement

Sugar intake has been linked to an increased risk of heart disease, diabetes, arthritis, and certain forms of cancers, depression, and schizophrenia (AHA, 2016).

Sound evidence supports the association of sugar to weight gain, cavities, and recently confirmed an increased risk for heart disease (AHA, 2016). A current study available highlighted that a diet high in added sugars may increase heart disease and early death, even for individuals who are not overweight (Yang et al., 2014). In a study where members' Healthy Eating Index was measured, analysis of the degree to which their diets coupled with federal guidelines showed that individuals who consumed more sugar had higher cardiovascular mortality (Willett, 2011).

Nutritional influences within an individual's life, particularly high sugar consumption has been recognized as an indicator for development of conditions including but not limited to weight gain, , headaches, obesity, cavities, hypertension, heart disease, metabolic syndrome, mental health issues, Type II diabetes, cancer, inflammation, arthritis, and addiction (AHA, 2016; Jacoby & Baldelomar, 2015; Varona, 2014). The CDC (2013) reported that the cost of treating high blood pressure in the U.S. amounts to $46 billion annually, which accounts for expenditures for health care services, medications for treatment, and days missed at work. The CDC (2013) continues to define the importance of sustaining recommended confines of daily sugar intake, especially for people who have hypertension. Aside from the predisposed risk factors already established, an individual's daily sugar intake could impact other aspects of their daily life.

Personality traits have long been linked to eating irregularities. A series of studies observed eating disorders and extreme personality traits. Eating disorders are referred to a

range of diagnoses that include anorexia nervosa, bulimia nervosa, and eating disorder not otherwise specified defined within the DSM-IV. Despite the extensive research on the extreme characteristics of personality, there has been no research on general personality traits and how they may relate to sugar intake. Therefore, previous research was not conducted to inquire how an individual's big five personality traits, including (a) openness, (b) conscientiousness, (c) extraversion, (d) agreeableness, and (e) neuroticism relate to daily sugar intake.

Research Design and Rationale

The research design was a cross-sectional, quantitative correlational research design. Leedy and Ormrod (2001) suggested that quantitative research "involves either identifying the characteristics of an observed phenomenon or exploring possible correlations among two or more phenomena" (p. 191). Cooper and Schindler (2008) defined research design as the "blueprint for fulfilling objectives and answering questions" (p. 89). A quantitative design refers to the fact that the study uses deductive reasoning to answer the research questions. Deductive reasoning is a logical process in which multiple premises, all believed true or found true most of the time, are combined to obtain a specific conclusion (Cooper & Schindler, 2008). Deductive reasoning stems from the positivist perspective where it is assumed that truth emanates from the five senses (Cooper & Schindler, 2008). If you cannot smell it, taste it, hear it, see it, or feel it than it is not the truth (Popper, & Miller, 1983). For example, participant's psychometric

characteristics were measured via numerical values. As such, study findings represent the truth that existed at the time the study was conducted.

Five research questions helped guide the study to determine if there is any relationship between Millennials openness, conscientiousness, extraversion, agreeableness, and neuroticism (independent variables) and daily sugar intake (dependent variable). The five research questions were answered via a quantitative design. Participants were asked to complete a demographic questionnaire and the Big Five Inventory. Multiple linear regression was used to statistically test the hypotheses. Inferential statistics were used to detect hypothesized relationships.

The research measured personality characteristics in Millennials via an online survey using a validated and normed questionnaire. Purposive sampling through SurveyMonkey panels were used to collect data from eligible participants. The design represented a plan to collect specific empirical evidence, identify data variance, and measure variance in the dependent variable operable of predictor variables. The purpose of this quantitative study was to test the theory of HBM as it relates to sugar intake and personality traits. The aim was to discover what effect personality schemas have on Millennials' sugar intake. The dependent variable, sugar intake is a continuously scaled variable while the predictor variables are also continuously scaled.

Figure 1 depicts the hypothesized relationship between the Big Five Personality Traits and daily sugar intake. Ovals represent latent variables while arrows represent direction of effect. R^2 represents the effect size or the amount of variance in the

dependent variable explained by the independent variable. The dashed line represents the overall effect that personality traits have on daily sugar intake.

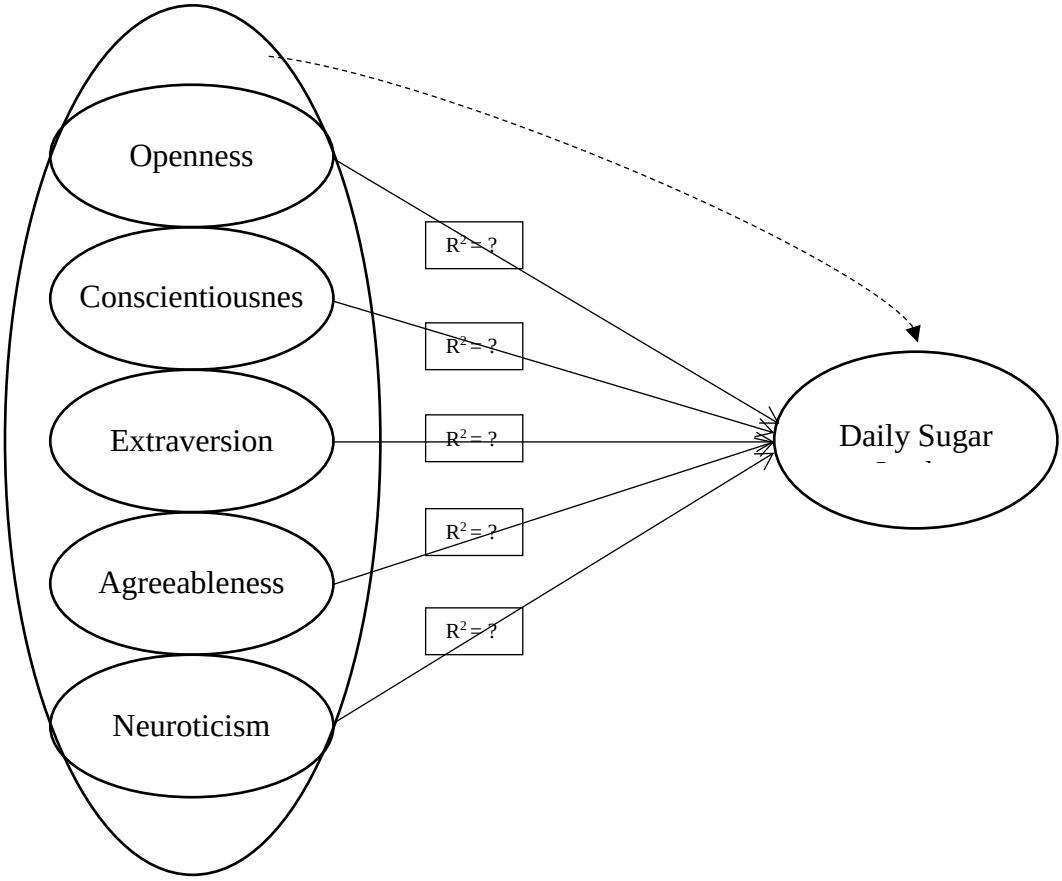

Figure 1. Theoretical model and the hypothesized relationship between the Big Five Personality Traits and daily sugar intake

The nature of the study was a quantitative, nonexperimental correlational design that employed survey methodology to gather data. The main purpose of the correlational study was to determine relationships between variables, and if a relationship exists, to

determine a regression equation that could be used make predictions to a population. The aim of the study was to test whether the independent variables (openness, conscientiousness, extraversion, agreeableness, neuroticism) predict the dependent variable (daily sugar intake) of the Millennial population. The survey was conducted online by SurveyMonkey panel participants. Questionnaires were distributed through SurveyMonkey to collect data from Millennials. There is a strong theoretical foundation that attitudes and beliefs predict individual health behavior. The Big Five Inventory measures an individual's attitudes and beliefs which inevitably is their personality (Burrus & Carney, 2015).

A cross-sectional survey to assess if there is an association between the big five personality traits and daily sugar intake of Millennials was conducted. Sugar consumption was based on environmental/biological conditions; that is, participant's sugar consumption derives from biologic circumstance rather than random placement.

Population

Millennials among the age range 18 to 35 were the target of this investigation. Data was obtained from all participants. Howe and Strauss (2000) used 1982 as the Millennials' starting birth year and 2004 as the last birth year. Although there are different opinions about exactly when the Millennial generation begins (e.g., 1980 vis a vis 1982) Millennials were chosen due to their unique relationship with sugar intake and their generational personality schema that has been extensively measured in several longitudinal studies (Lloyd et al., 2013). For example, Millennials have been found to be

more narcissistic and feel more entitled than any previous generation (i.e., Generation X and Baby Boomers) (Twenge & Campbell, 2010).

It is estimated that there are 75 million Millennials in the U.S. (Rivera & Huertas, 2006). Millennials is the alias for the newest generation to reach adulthood. The Millennials are also called the Digital Natives for the reason that they are inherent users of technology, assured in the digital language of computers, video games and the Internet (Rivera & Huertas, 2006). According to Marano (2004) the Millennial generation may well lack core resiliency and limit setting behavior that is consequential of determining one's own struggles. Marano and Arnett (2004) suggested that this produces a circumstance that encourages binge behavior extending from eating and dieting patterns. Participant inclusion criteria for the target population included:

- Over 18 years old
- Must be willing to participate
- Residing in the United States
- Gender, race, education, and location were not conditions for selection

Sample

A purposive sampling technique was used. Participants were selected by contract with SurveyMonkey to select participants for the study based on the specified selection criteria. Therefore, SurveyMonkey randomly selected participants from their panel to participate in the study using appropriate selection criteria. SurveyMonkey prescreened subjects prior to panel inclusion. However, all participants answered prescreening

questions prior to taking the main survey to ensure selection criteria fidelity. SurveyMonkey panels consisted of a representative sample of the U.S. population. All panel participants voluntarily elected to participate. The study aimed for 100 participants that meet selection criteria. Once contracted and deployed, and after IRB approval, SurveyMonkey sent out approximately 200 surveys to the selected participants. Once 100 participants completed the survey, SurveyMonkey automatically stopped data collection.

Sampling and Sampling Procedures

Implementation of a purposive sampling technique helped to obtain the sample from the millennial population. Types of purposive sampling include maximum variation sampling, homogeneous sampling, typical case sampling, extreme case sampling, critical case sampling, total population sampling, and expert sampling (Neuman, 2003).

Purposive sampling takes into account the individual that has been identified as ready for examination and satisfies specific inclusion criteria (Neuman, 2003). Purposive sampling was used to obtain appropriate panels from the selection criteria. SurveyMonkey was used to construct a panel consisting of selection criteria. From that panel, SurveyMonkey randomly selected participants willing to participate. Therefore, from the panel obtained through purposive sampling, those participants were randomly selected through SurveyMonkey. According to Merriam (1998), this sampling technique was applied particularly in the presence of restraints in "time, money, location, as well as availability of sites or respondents" (p. 63). The main goal of purposive sampling was to

focus on particular characteristics of the selected population which will best enable me to answer the research questions.

Purposive sampling techniques are regularly applied within research to gather information commonly characteristic of the populace in examination. According to Walonick (2004), the purposive sampling procedure is frequently applied to research to appraise results deprived of general cost and time mandatory to choose a random sample (p1). Additionally, this method supports the scientist perform in reach of a defined period and circumstances which facilitate data assembly. Therefore, purposive sampling loses some degree of transferability and as a result, may lack presentation of the entire population targeted. As a result, participants selected can only moderately embody the populace within the study. Intrinsically, reproduction may be essential to fully confirm the results from the study (Keppel & Zedeck, 2001).

Notwithstanding its shortages, purposive sampling was considered an ideal approach to attain a sample from a population given time and circumstances. Accordingly, purposive sampling supports the scientist to pursue an approximation of truth when attaining reality (i.e. via random sampling) (Creswell, 2009).

Power Analysis

G Power was used to determine the minimum sample size for the study (Faul, Erdfelder, Lang, & Buchner, 2007). The method within G Power is *F* tests - multiple linear regression: Fixed model, R^2 deviation from zero. *A priori* sample purpose is measured by conducting a recognized power analysis (Aberson, 2010). Three aspects

reserve attention when guiding the inquiry comprising the anticipated power of the study, the effect size of the phenomena under study, as well as the level of significance to be applied in rejecting the null hypotheses (alpha) (Aberson, 2010). Study power is the probability of rejecting a false null hypothesis (Aberson, 2010). According to Kuehl (2000), a custom widely accepted agreement of power to reject a false null hypothesis is .80. Cohen (1988) emphasized effect size as an evaluation dimension of the power of the association amongst variables within the study. The effect size was categorized by means of Cohen's f^2, small, medium, and large (Cohen, 1988). As a result, a small effect = .10, medium = .25 and large = .40 (Cohen, 1988).

Alpha is specified by the confidence conveyed in the manner in which the null hypothesis is rejected. Social science research agreement advocates that alpha is determined at .05. Accordingly, with an established power by .80, the effect size recognized at .15, and the alpha determined by .05, the sample size necessary was 92 contributing participants (Faul et al., 2007). Five predictors were inserted into the model. Multiple linear regression provided the means to test all the predictors as a composite variable and also test individual predictors using one test. Figure 2. displays the relationship between power and sample size; as sample size increases, power increases.

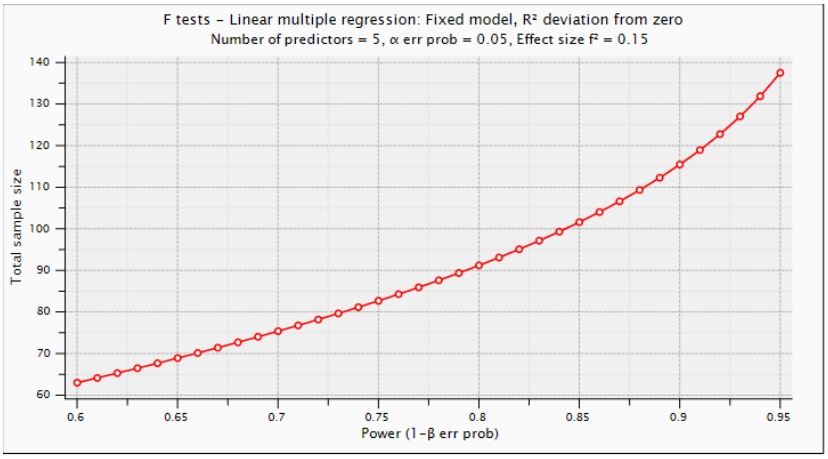

Figure 2. Power plot depicting the relationship between sample size and power

Procedures for Recruitment, Participation, and Data Collection

The proposed research was conducted via the SurveyMonkey platform. SurveyMonkey was established in 1999 and is considered to be the world's leading provider of web-based survey solutions. Sensitive data was protected through secure transmission along communication pathways. SurveyMonkey has methods and procedures to protect sensitive data that is proprietary to participants. Informed consent was included in the first page of the survey. A step by step of how the survey was conducted is outlined:

- Purposive sample participants through SurveyMonkey to create a panel willing to participate in the study.
- Panel participants were selected based on selection criteria.

- SurveyMonkey then randomly selected participants from their panel to participate in the study.
- SurveyMonkey sent a link to the survey to panel participants.
- Once the minimum sample size was obtained, the survey was closed.
- Survey responses was downloaded by me to an excel file and maintained on a secure server.

SurveyMonkey was used to obtain participants willing to participate in the study. A sample of participants were collected from a proprietary panel within SurveyMonkey. It took approximately 7 days to obtain a panel of participants and complete the survey via SurveyMonkey. Data collected was stored within SurveyMonkey platform and downloaded for analysis. The survey was controlled by password and used to download data. The survey invitation asked respondents to provide their valuable insight to help facilitate the proposed research study. Clear instructions were provided within the invitation to start the survey. The invitation included a link that guided the participant to the informed consent form and the survey. The invitation also included a support email to address any questions pertaining to the survey. The survey was deployed and data was collected in early December 2016. The survey was uploaded to SurveyMonkey for 2 weeks.

Instrumentation

Three distinct instruments were used in the study to collect data from participants. The five-factor model of personality (FFM) inventory was used to measure dimensions of

personality (Appendix A). The 2010-2011 Sugar Intake Health Survey (Appendix B) was used to measure personal sugar intake and a four-item demographic survey was used to profile the sample (Appendix C).

Five-factor model of personality Inventory

This study utilized the Five-factor model of personality (FFM). The survey has been published in the public domain and is free to use without permission from the authors (International Personality Item Pool, 2016). The FFM (NEO-PI-R Broad Domains of Personality) has a total of 10 questions per personality dimension. Respectively elements of the FFM are scaled at the interval level, where reply choices range from 1-6, with 1=strongly disagree, 2 = disagree, 3 = disagree more than agree, 4=agree more than disagree, 5 = agree, and 6= strongly agree (Appendix A).

The five-factor representation of personality (FFM) consists of five expansive trait measurements commonly represented as the "Big Five": Extraversion, Agreeableness, Conscientiousness, Neuroticism (on occasion termed by its polar contrary, Emotional Stability), and Openness to Experience (on occasion termed Intellect) (Soto & Jackson, 2015). According to John, Naumann, and Soto (2008), trait classification must convey a logical outline for differentiating, comparing, and designating the conduct, emotional, and observed individualities of people. Advantages of the Big Five are representative of the easily understood terms that describe the elements (John et al., 2008). Pytlik Zillig and colleagues found there are significant differences among the five personality traits when studied to understand if they are broad

in the concepts they incorporate and in the extensiveness of their effects (Pytlik Zillig, Hemenover, & Dienstbier, 2002). While traits have been explained historically by explicit behavior, in recent years, attention to both covert and overt responses with emphasis on behavior, cognition, and affect is important (Pervin, 1994; Angleitner, John, & Lohr, 1986; Werner & Pervin, 1986).

The aim of this study was to quantify the relationship among sugar intake and a representation encompassing five predictor variables (a) openness, (b) contentiousness, (c) extraversion, (d) agreeableness, and (e) neuroticism. Five predictor variables and a single dependent variable were specified in Figure 1. Within the representation, unstandardized beta (β) depicts the slope of the regression line or the change in the dependent variable for each one-unit variation in the predictor variable.

2010-2011 Sugar Intake Health Survey

The five-item sugar intake survey was used to measure participant's general sugar intake. The survey was developed by the Northern Ireland Health Services department in 2010 for the general population of Ireland. The survey has been published in the public domain and does not require permission to use (Appendix D). The survey applied a Likert-type arrangement to evaluate frequency of sugar intake on a regular basis. The survey was scaled at the ordinal/interval level meaning that individual items are scaled at the ordinal level whereas the total summated score is scaled at the interval level. The total score was derived by adding up replies to each question and then dividing by 5 (the number of items) to obtain a total score. Response option scaling included: 1 = Never, 2

= Rarely, 3 = Occasionally, 4 = Frequently, and 5 = Always. The second section of the survey was estimated less than five minutes to complete.

Demographic Survey

Four questions were used to profile participants. The demographic survey was to help understand the characteristics of the sample being collected. The data will also help future researchers conduct similar research if necessary or appropriate. The survey questions included Gender, Age, Education, and Ethnicity. Response options for each question were scaled at the nominal, ratio, and ordinal level respectively. Specifically, gender is scaled at the nominal level, age is scaled at the ratio level, and education and ethnicity is scaled at the ordinal level. Participants were required to answer all questions to the best of their ability.

Reliability and Validity

Reliability and validity of the big five instrument was assessed via Cronbach's alpha and factor analysis. The sample used to validate the instrument included industrial blue collar, white collar, and professional employees (Hamel & Bracken, 1986). Findings revealed that the overall reliability coefficients for the five sub-constructs were greater than .70, meaning that the overall FFM was sufficiently reliable. Specifically, internal consistency for each construct was found to be: Extroversion= .80, Agreeableness = .75, Conscientiousness = .83, Neuroticism = .85 and Openness = .68 (Sherry, Hewitt, Flett, Lee -Baggley, & Hall, 2007).

Findings from the factor analysis revealed that five distinct latent constructs emerged. Specifically, variables (a) openness, (b) contentiousness, (c) extraversion, (d) agreeableness, and (e) neuroticism. The five factors accounted for 72.8% of the overall Stress construct (Teh, Yong, Chong & Yew, 2011).

Operationalization of Variables

Daily Sugar Intake (DV)

Daily Sugar Intake (DSI) was measured using a 5-point Likert-type scale that is described by frequency of behavior, but anchored by numerical values; where, frequency of behavior is categorized as: 1 = *Never*, 2 = *Rarely*, 3 = *Occasionally*, 4 = *Frequently*, and 5 = *Always*. Five semantic phrases were used to describe behaviors related to sugar intake. Respondents were asked to select a numerical response that best fits their frequency of the behavior. Lower values mean less frequency while higher values represent greater frequency. The scale is considered an ipsative scale where respondents are forced to select an option; an escape option was not provided. Further, the scale was assumed to be an interval level scale since an equal relationship between response options existed (i.e., numerical values). Scores from the five questions were summed and averaged to obtain an overall sugar intake score for each participant.

Openness (Predictors)

Openness relates to qualities of interpersonal interaction such as accepting and adapting to others' viewpoints, and to conveying unrestricted rather than customary family values (McCrae, 1996). Openness has been associated with terms such as fantasy,

aesthetics, feelings, actions, ideas, and values by Costa and McCrae (1992). Openness was measured using a 6-point Likert-type scale that is anchored by numerical values. Ten semantic phrases were used to describe behaviors related to being open to experiences. Respondents were asked to select a numerical answer that best fits their agreement to the question. Lower values mean less agreement while higher values represent greater agreement. Response options were scaled at the interval level where 1=*strongly disagree*, 2 = *disagree*, 3 = *disagree more than agree*, 4=*agree more than disagree*, 5 = *agree*, and 6= *strongly agree.* The scale is considered an ipsative scale where respondents are required to select an option; an escape option was not provided. Further, the scale was assumed to be an interval level scale since an equal relationship between response options existed. Scores from the ten questions were summed and averaged to obtain an overall openness score.

Extraversion, (Predictors)

Extraversion relates to qualities of interpersonal interaction such as warmth and sociability with others, confidence and excitement seeking as well as positive emotions (Costa & McCrae, 1992). Extraversion was measured using a 6-point Likert-type scale that is affixed by numerical values. Ten semantic phrases were used to describe behaviors related to extraversion. Participants were requested to select a numerical answer that best fits with their agreement to the question. Lower values mean less agreement while higher values represent greater agreement. Response options were scaled at the interval level where 1=*strongly disagree*, 2 = *disagree*, 3 = *disagree more than agree*, 4=*agree more*

than disagree, 5 = *agree,* and 6= *strongly agree.* The scale is considered an ipsative scale where respondents are required to select an option; an escape option was not offered. Further, the scale was assumed to be an interval level scale since an equal relationship between response options existed. Scores from the ten questions were summed and averaged to obtain an overall extraversion score.

Agreeableness, (Predictors)

Agreeableness has been associated with trust, straightforwardness, altruism, ideas, values (Costa & McCrae, 1992). Agreeableness is also characterized as a blend of friendliness and compliance (Costa & McCrae, 1992). Agreeableness was measured using a 6-point Likert-type scale that is defined by numerical values. Ten semantic phrases were used to describe behaviors related to agreeableness. Participants were requested to select a numerical answer that best fits with their agreement to the question. Lower values mean less agreement while higher values represent greater agreement. Response options were scaled at the interval level where 1=*strongly disagree*, 2 = *disagree,* 3 = *disagree more than agree*, 4=*agree more than disagree*, 5 = *agree,* and 6= *strongly agree.* The scale is considered an ipsative scale where respondents are required to select an option; an escape option was not offered. Further, the scale was assumed to be an interval level scale since an equal relationship between response options existed. Scores from the ten questions were summed and averaged to obtain an overall agreeableness score.

Conscientiousness, (Predictors)

Conscientiousness has been associated with competence, order, dutifulness, achievement striving, self-discipline, deliberation (Costa & McCrae, 1992). This feature is occasionally discussed to as Dependability (Costa & McCrae, 1992). Conscientiousness was measured using a 6-point Likert-type scale that is affixed by numerical values. Ten semantic phrases was used to describe behaviors related to conscientiousness. Participants were requested to select a numerical answer that best fits with their agreement to the question. Lower values mean less agreement while higher values represent greater agreement. Response options were scaled at the interval level where 1=*strongly disagree*, 2 = *disagree*, 3 = *disagree more than agree*, 4=*agree more than disagree*, 5 = *agree*, and 6= *strongly agree.* The scale is considered an ipsative scale where respondents are required to select an option; an escape option was not offered. Further, the scale was assumed to be an interval level scale since an equal relationship between response options existed. Scores from the ten questions were summed and averaged to obtain an overall conscientiousness score.

Neuroticism (Predictors)

Neuroticism has been associated with anxiety, angry hostility, depression, self-consciousness, impulsiveness, vulnerability (Costa & McCrae, 1992). Neuroticism is occasionally recorded in the opposed direction and discussed to as Emotional Stability (Costa & McCrae, 1992). Neuroticism was measured using a 6-point Likert-type scale that is affixed by numerical values. Ten semantic phrases were used to describe behaviors related to neuroticism. Participants were requested to select a numerical answer that best

fits with their agreement to the question. Lower values mean less agreement while higher values represent greater agreement. Response options were scaled at the interval level where 1=*strongly disagree*, 2 = *disagree*, 3 = *disagree more than agree*, 4=*agree more than disagree*, 5 = *agree*, and 6= *strongly agree.* The scale is considered an ipsative scale where respondents are required to select an option; an escape option was not offered. Further, the scale was assumed to be an interval level scale since an equal relationship between response options existed. Scores from the ten questions were summed and averaged to obtain an overall neuroticism score.

Data Analysis

Multiple linear regression was used to test hypothesis 1. Multiple linear regression analysis is a statistical method applied to research the relationship among a single dependent variable (Daily Sugar Intake (DSI)), and two or more predictor variables (Allison, 1999). The dependent variable for the single hypothesis in the regression model is DSI and the collective set of independent variables applied to test hypothesis 1 are Openness, Extraversion, Agreeableness, Conscientiousness, and Neuroticism. The first hypothesis was planned to be accepted if the collective set of predictors is significantly correlated with DSI at $p < .05$ level. If the overall model was significant then Hypotheses 2-6 was to be evaluated to determine if the individual predictors statistically affect frequency of daily sugar intake. A p-value < 0.05 would determine that the findings are statistically significant.

Data analysis was directed through the application of the Student Version 20.0 of the Statistical Package for the Social Sciences (SPSS) software program. The study outcomes are offered in three separate segments within Chapter 4. The discrete segments of the chapter encompass demographic details, details of analyses, including a summary of the results sector. The demographic segment consists of a descriptive narrative of subject's characteristics. The detail of analysis segment in the chapter delivers a comprehensive examination of the hypothesis together with valuation of proper assumptions and concluding inferential outcomes. In conclusion, the summary of results segment covers a review of the overall research, the study design, conclusions through as well as expectations for the reader within chapter 5.

Based on the Health Belief Model and lack of research on the relationship between personality traits and sugar intake, the following research question and associated hypotheses are:

RQ1: What is the relationship between Millennials combined personality traits of openness, conscientiousness, extraversion, agreeableness, and neuroticism and frequency of daily sugar intake?

$H1_0$: There is no relationship between openness and frequency of daily sugar intake.

- Dependent Variable: Frequency of Daily sugar intake
- Predictor Variables: openness, conscientiousness, extraversion, agreeableness, and neuroticism scores

- Statistical analysis: Multiple Linear Regression
    - Y = A + BX1 + BX2 + BX3 + BX4 + BX5 + E

A is equal to the constant where X is 0 at Y. B is the slope of the regression line and X1 is the value of predictor 1, X2 is the value of predictor 2, X3 is the value of predictor 3, X4 is the value of predictor 4, and X5 is the value of predictor 5. E is equal to the error term. Multiple linear regression also provides the unique variants of X and Y (for X1 and Y, X2 and Y, etc.). Multiple regression analysis gives us the overall and the unique variance of X1 and Y, X2 and Y, X3 and Y, X4 and Y, X4 and Y. Multiple linear regression was used to avoid family wise error. Family wise error is the condition where the dependent variable is analyzed multiple times. Multiple linear regression provides the means to test the overall plus the individual predictor variables against the dependent variable in a single test.

Demographic variables were not used as control variables given that no recent substantive research has been conducted to suggest an effect exists. If an overall effect is found, recommendations for research were suggested.

$H2_0$: There is no relationship between Openness and frequency of daily sugar intake.

- Dependent Variable: Frequency of Daily sugar intake
- Predictor Variable: Openness score
- Statistical analysis: Multiple Linear Regression

$H3_0$: There is no relationship between conscientiousness and frequency of daily sugar intake.

- Dependent Variable: Frequency of Daily sugar intake
- Independent Variable: Conscientiousness score
- Statistical analysis: Multiple Linear Regression

$H4_0$: There is no relationship between extraversion and frequency of daily sugar intake.

- Dependent Variable: Frequency of Daily sugar intake
- Independent Variable: Extraversion score
- Statistical analysis: Multiple Linear Regression

$H5_0$: There is no relationship between agreeableness and frequency of daily sugar intake.

- Dependent Variable: Frequency of Daily sugar intake
- Independent Variable: Agreeableness score
- Statistical analysis: Multiple Linear Regression

$H6_0$: There is no relationship between neuroticism and frequency of daily sugar intake.

- Dependent Variable: Frequency of Daily sugar intake
- Independent Variable: Neuroticism score
- Statistical analysis: Multiple Linear Regression

In effort to identify the correlation or effect discovered within the study, a regression table was presented. As previously mentioned, the alpha was established at p = .05 on condition that assumptions of normality are met during the study analysis. Proper steps were taken if assumptions were violated. As an example, the investigator may select to transform the variables to normalize an offending distribution when assumptions are slightly violated.

Profile of Sample. Age was applied to profile contributors replying to the survey. Individually, the variable was conferred by means of presenting quantitative descriptions in writing and demonstrated through a table. The data conveyed consisted of frequency count by group level (where appropriate), Mean, Standard Deviation, Skewness, Kurtosis and Total number of respondents (N). SPSS/EXPLORE and SPSS/DESCRIPTIVE was applied to derive the above-mentioned data points.

Outliers. A test for univariate outliers was conducted to determine if any cases may not statistically be part of the sample collected. In effort to distinguish outliers, case scores were converted into z-scores and compared to the critical value of +/- 3.29, $p <$ .001; +/- 3.29 represents greater than 3 standard deviations from the mean (Tabachnick & Fidell, 2007). Those cases that exceeded this value were removed.

Missing Data. Cases with missing data were detected by running frequency counts in SPSS 17.0. Cases with more than 5 % missing data were removed from analysis. This means that if a participant did not respond to a question on the sugar intake questionnaire or one of the big five sub constructs, they were removed from the study.

Parametric Assumptions. Assumptions of normality, linearity, as well as homoscedasticity were evaluated to detect any violation of parametric assumptions. Nevertheless, a graphical device was created to assist in determining the degree of normality. Specifically, a histogram was presented to provide visual evidence of degree of normality. Nonnormality was detected by running Shapiro-Wilks' test and creating z-scores for skewness and kurtosis. If the distribution is found to be nonnormal, variable transformation were attempted to improve distribution parameters.

Order of Analyses. Demographic data were presented first to build a profile of the sample population verified. Subsequently, missing data as well as outliers were evaluated and accomplished according to the prescription presented. Moreover, normality was evaluated to ensure parametric assumptions are met. As a final point, Multiple linear regression was utilized to test H1, to define if relationships occur among the specified variables.

Threats to Validity

Prospective weaknesses of the study take account of sampling technique, inferential statistics, as well as the type of statistical analysis utilized. Considering a purposive sampling methodology was utilized, generalization to the greater population may be impacted. Nevertheless, it is assumed that the targeted sample were a representative sample of the population under examination. Moreover, considering inferential statistics were used to draw conclusions, the probability of committing a Type I error exists; where a true null hypothesis is incorrectly rejected. However, to diminish

this concern, the confidence level to define acceptance of the null hypothesis was set at .05. Therefore, the probability of error was expected at less than 5%. In addition, correlational designs as expected limit generalizability given the nature of the variables. The predictor and dependent variables in the study have been predefined by environmental passage. Accordingly, a true experiment by means of random assignment cannot be used. As a result, only correlation distinctive of causation can be concluded from the study results.

The scope of the study was limited to Millennials meeting specific age inclusion criteria to reduce the effect of confounding variables. Further, the study design was limited to a quantitative approach, which reduces the effect of researcher bias. This means that the likelihood of researcher bias influencing findings is reduced. Finally, only validated and reliable instruments were used in the study. This approach reduces the possibility of measuring latent constructs that are not part of the study variables.

Ethical Consideration

Ethical considerations were made related to the stages of research that involved formulating the research questions and designing the study including types of questionnaires and ethics. Additionally, the data collection processes, analysis, and reporting employed considerations towards ethics. Professional ethical guidelines from the Code of Conduct of the American Psychological Association (APA, 1992) were considered throughout the study. The process of data and safety monitoring was applied when reviewing results to guarantee the continuing safety of participants and the

continuing validity and scientific merit (APA, 1992). Informed consent was provided to the participants before conducting the survey. Although no potential harm was expected, participants were informed of their right to refuse participation before or during the survey (Frankfort-Nachmias & Nachmias, 2008). Confidentiality information was not collected. This means that names, addresses, or any information that will identify the participant were not taken. Researcher and dissertation chair contact information were provided in advance of the survey. Institutional permissions, including IRB approvals were obtained for the study.

Ethical considerations account for the participant's right to anonymity in that identifying information was not used to ensure this right. The risk level to participants was considered to be negligible. In addition, all through the data collection and prior to commencing the data analysis process, each participant's results were coded numerically to prevent identification.

An additional ethical consideration was voluntary participation. Participants were required to consent to volunteering to participation after they had read the informed consent form (ICF). The informed consent form explained the significance of the study including risks. The ICF clearly articulated that participation is voluntary.

The survey was organized based upon the proposal that good ethical research will inform respondents in advance with regards to their involvement and their free will to participate in the study (Fowler, 2009). The data collection instrument applied considered respect for the identity, opinions, and privacy of the respondent. Information with regard

to the participant's name, religious beliefs, sexual orientation, health, or other records were not questioned or gathered for the study. The informed consent declared all confidentiality, privacy, and anonymity of the participants. Findings were published in aggregate form, meaning that an individual's responses, despite its anonymous quality, were not revealed or recorded for public view.

Summary

This quantitative study examined the relationship between the Big Five Personality traits and daily sugar intake in Millennials. Chapter 3 outlined not only the research methodology that was utilized to accomplish this determination but also defined the sample, data collection processes, and data interpretation/analysis. In conclusion, ethical deliberations were well-thought-out to confirm to confidentiality as well as protection of all contributing participants.

Chapter 4 will take account of a depiction of the data gathered, the data analysis procedures, as well as the results of the study as they connect to the hypotheses and the research questions. In continuance, Chapter 5 will discourse an outline of the research, clarification of the findings, inferences of the study results, confines identified within the study, as well as proposals for imminent examination.

Chapter 4: Results

Introduction

The link between sugar and various ailments have been confirmed by various aforementioned studies. More recently, the link between dietary sugar intake and disease mortality was confirmed by Dhurandhar and Thomas (2015). With approximately 15 years of follow up, study findings confirmed individuals who consumed more than 25% total added sugar intake had greater cardiovascular mortality (Dhurandhar & Thomas, 2015). Majority of the US population consume more added sugar than is suggested for a healthy diet.

Personality traits and the link to health related issues has been confirmed. However, there has been no research on personality traits and how they may relate to sugar intake. Considering the present overwhelming occurrence of nutrition-related health problems and their associated social costs, dietary changes are immediately required to reduce sugar intake (Romieu et al., 2016). Filling this gap may be necessary for supporting individuals to reduce sugar intake that will in turn help promote health and quality of life.

Data Collection

Walden's Institutional Review Board (IRB) approval was obtained for my study entitled; the approval number is 11-15-16-0295536. After finishing designing the survey, a web link was created to distribute the survey through the SurveyMonkey platform. To start collecting responses, the web link was sent to the defined target audience by email.

The target audience was determined based on individuals who meet the defined selection criteria. The link directed the individual to the invitation letter and informed consent form. Participants had to agree to the terms and conditions of the informed consent form before moving on to the survey. The survey was divided in three sections: the demographic section which contained four questions, the Sugar Intake Survey containing five questions, and the Personal Inventory containing 10 questions. The survey included a total of 19 questions. Survey responses were then recorded directly into the account created within SurveyMonkey. A total of 106 participants signed up for the study through the SurveyMonkey Participant Pool. The study was deployed during November 2016. SurveyMonkey sent out reminders to announce the study and remind signers to participate in the study. The average time a participant spend on answering the questions was 14 minutes; the least was 5 minutes, and the most being 30 minutes.

Data Analysis Procedures

Inferential statistics were used to draw conclusions from the sample tested. After further review of the Big Five Personality Inventory, a multiple linear regression analysis was deemed appropriate because the Survey had interval-type data. Multiple linear regression analyses was deemed the appropriate data analysis procedure to reduce the probability of Type 1 statistical errors. The Statistical Package for the Social Sciences (SPSS) was used to code and tabulate scores collected from the survey and provide summarized values where applicable including the mean and standard deviation. Multiple Linear Regression analysis was used to evaluate the six hypotheses:

$H_0$1: There is no relationship between a model containing five personality traits (openness, conscientiousness, extroversion, agreeableness, and neuroticism) and frequency of Millennials daily sugar intake.

$H_0$2: There is no relationship between openness and frequency of daily sugar intake.

$H_0$3: There is no relationship between conscientiousness and frequency of daily sugar intake.

$H_0$4: There is no relationship between extraversion and frequency of daily sugar intake.

$H_0$5: There is no relationship between agreeableness and frequency of daily sugar intake.

$H_0$6: There is no relationship between neuroticism and frequency of daily sugar intake.

Prior to analyzing the six hypotheses, I performed data cleaning and data screening to ensure the variables of interest met appropriate statistical assumptions. Thus, the multiple linear regression analyses were conducted after study variables were first evaluated for missing data, univariate outliers, normality, linearity, and homoscedasticity. Subsequently, multiple regression analyses, and zero-order correlation analysis were conducted to determine if there were significant relationships between variables of interest. Displayed in Table 2 is a summary of the variables and analyses used to evaluate the six research questions.

Table 2

Variables and Statistical Tests Used to Evaluate Research Questions 1 and 2

Research Question	Criterion Variable	Predictor Variable	Statistical Test
H1	Sugar Intake	Combined Big Five Traits	Multiple Linear Regression and Zero-order Correlation
H2	Sugar Intake	Openness	Multiple Linear Regression and Zero-order Correlation
H3	Sugar Intake	Conscientiousness	Multiple Linear Regression and Zero-order Correlation
H4	Sugar Intake	Extraversion	Multiple Linear Regression and Zero-order Correlation
H5	Sugar Intake	Agreeableness	Multiple Linear Regression and Zero-order Correlation
H6	Sugar Intake	Neuroticism	Multiple Linear Regression and Zero-order Correlation

Reliability Analyses

Reliability analysis was run to determine if the criterion variable (sugar intake) and predictor variables (Big Five Personality Inventory) were sufficiently reliable. Reliability analysis was used to study the properties of measurement scales and the items that compose the scales (Nunnally, 1978*)*. Cronbach's alpha (α) reliability analysis procedure calculated a reliability coefficient that ranged between 0 and 1. The reliability coefficient was based on the average interitem correlation. Internal consistency is a procedure to estimate the reliability of a test from a single administration of a single form (Nunnally, 1978). Internal consistency depends on the individual's performance from item to item based on the standard deviation of the test and the standard deviations of the items. Acceptable levels of reliability depend on the purpose of the instrument. Acceptable reliability of instruments developed for research purposes can be as low as 0.60 (Nunnally, 1978*).*

Reliability Analyses of the Big Five Instrument

Reliability of the Big Five instrument was assessed via Cronbach's alpha. Internal consistency for each construct was found to be sufficiently reliable: Openness = .67, Conscientiousness = .80, Extroversion = .81, Agreeableness = .71, and Neuroticism = .79. Findings correspond with research conducted by Sherry, Hewitt, Flett, Lee -Baggley, & Hall (2007).

Table 3.

Reliability Analysis of the Big Five Traits from Research and Current Study

Big Five Traits	Sherry, et, al (2007)	Cronbach's alpha
Openness	0.68	0.67
Conscientiousness	0.83	0.80
Extroversion	0.80	0.81
Agreeableness	0.75	0.71
Neuroticism	0.85	0.79

Reliability Analyses of the Sugar Intake Survey

Reliability analysis was run to determine if the criterion variable (sugar intake) was sufficiently reliable. Results from the tests found that Cronbach alpha was .058e (α = 0.58, N = 106).

Demographics

Data were collected from 106 participants. Fifty four participants were female while 52 participants were male. Sixty nine participants (65%) were between the ages of 35-44 years old (*n* = 69) while 30 (28%) were between the ages of 25 and 34 (*n* = 30). Only six participants were older than 44 and one participant reported their age being less than 25.

Table 4

Frequency and Percent Statistics of Participants' Gender and Age Group

Demographic Variable	Frequency	Percent
Gender		
Female	54	50.90
Male	52	49.10
Age Group		
18-24	1	0.90
25-34	30	28.30
35-44	69	65.10
45-54	5	4.70
55-64	1	0.90

Note. Total *N* = 106

For education level, most participants reported graduating from college (*n* = 38, 36%). Approximately 15% (*n* = 16) reported graduating from high school while another 15% (*n* = 16) reported having 2 years of college. Furthermore, 36% of participants' highest level of education was a bachelor's degree (*n* = 38). Approximately 11% (*n* = 12) reported having some graduate school or having completed graduate school.

Participants were mostly Caucasian (*n* = 68, 64%) while approximately 19 participants reported being African American (*n* = 19, 18%). Displayed in Table 5 are frequency and percent statistics of participants' age groups, level of education, and educational setting.

Table 5

Frequency Statistics for Education and Ethnicity

Demographic Variable	Frequency	Percent
Education		
11th Grade	3	2.80
Graduated High School	16	15.10
1 year College	9	8.50
2 year College	16	15.10
3 year College	11	10.40
Graduated College	38	35.80
Some Graduate School	5	4.70
Completed Graduate School	7	6.60
Ethnicity		
American Indian or Alaskan Native	2	1.90
Asian or Pacific Islander	6	5.70
African American	19	17.90
Hispanic/Latino	9	8.50
Caucasian	68	64.20
Prefer not to answer	2	1.90

Analysis of Hypotheses 1-6

Hypotheses 1-6 were tested using multiple linear regression and a zero-order correlation analysis. The dependent variable for Hypotheses 1-6 was sugar intake scores as measured by the 6-item Sugar Intake survey. The independent variables for the

hypotheses were the Big Five Personality Traits. Items were averaged to obtain an overall trait score for each dimension.

Descriptive statistics were run for each variable in the study. The sample size was 106 (*N* = 106). The 6-item Sugar Intake Inventory was scaled at the interval level where response options were: 1= *Never*, 2 =*Rarely*, 3 = *Occasionally*, 4 = *Frequently*, and 5 = *Always*.

The FFM (NEO-PI-R Broad Domains of Personality) was scaled at the interval level where response options ranged from 1-7, with 1=*strongly disagree*, 2 = *disagree*, 3 = *disagree more than agree*, 4 = *neither agree nor disagree*, 5=*agree more than disagree*, 6 = *agree*, and 7= *strongly agree*. Table 6 displays minimum, maximum, mean, and standard deviation, *N* = 106.

Table 6

Descriptive Statistics for the Eight variables used in the Study

Variables	Minimum	Maximum	Mean	Std. Deviation
Gender	1.000	2.000	1.491	0.502
Age	1.000	5.000	2.764	0.594
Sugar Intake	1.200	4.600	2.564	0.696
Extraversion	1.000	7.000	4.005	1.513
Agreeableness	1.500	7.000	4.807	1.156
Conscientiousness	2.000	7.000	5.217	1.201
Emotion	1.500	7.000	4.481	1.456
Openness	1.500	7.000	5.278	1.195

Data Cleaning

Data were collected from a sample of 106 participants within the United States. Before data were evaluated, the data were screened for missing data and univariate outliers. Missing data were investigated using frequency counts and no cases were found to exist. The data were screened for univariate outliers by transforming raw scores to z-scores and comparing z-scores to a critical range between - 3.29 and + 3.29, $p < .001$ (Tabachnick & Fidell, 2007). Z-scores that exceed this critical range were more than three standard deviations away from the mean and thus represented outliers. The distributions were evaluated and no cases with univariate outliers were found within the distribution. Therefore, data were collected from a sample of 106 millennials ($N = 106$).

Normality

Before Hypothesis 1 was analyzed, basic parametric assumptions were assessed. For the model containing all five personality traits, assumptions of normality and heteroscedasticity were tested. To test if the distributions were normally distributed the skew and kurtosis coefficients were divided by the skew/kurtosis standard errors, resulting in z-skew/z-kurtosis coefficients. This technique was recommended by Tabachnick and Fidell (2007). Specifically, *z*-skew/z-kurtosis coefficients exceeding the critical range between - 3.29 and + 3.29 ($p < .001$) may have indicated nonnormality. Thus, based on the evaluation of the z-skew/z-kurtosis coefficients, the variables were not found to be significantly skewed ($z\text{-}skew < 3.29$) or kurtotic ($z\text{-}kurtosis < 3.29$). In addition, after examining the normal probability-probability plot of regression

standardized residuals, heteroscedasticity was assumed. Figure 3 depicts the normal probability-probability (P-P) plot based on the standardized residuals. The X axis depicts the observed cumulative probability based on the percentiles in the frequency distribution of the residuals. The Y axis is based on taking the standardized residual (Z-score) and computing the cumulative density (percentile; probability of that value or below) from the normal distribution. If the residuals were normally distributed the values would fall on the diagonal line of identity. As evidenced by the plot, no evidence of heteroscedasticity was present.

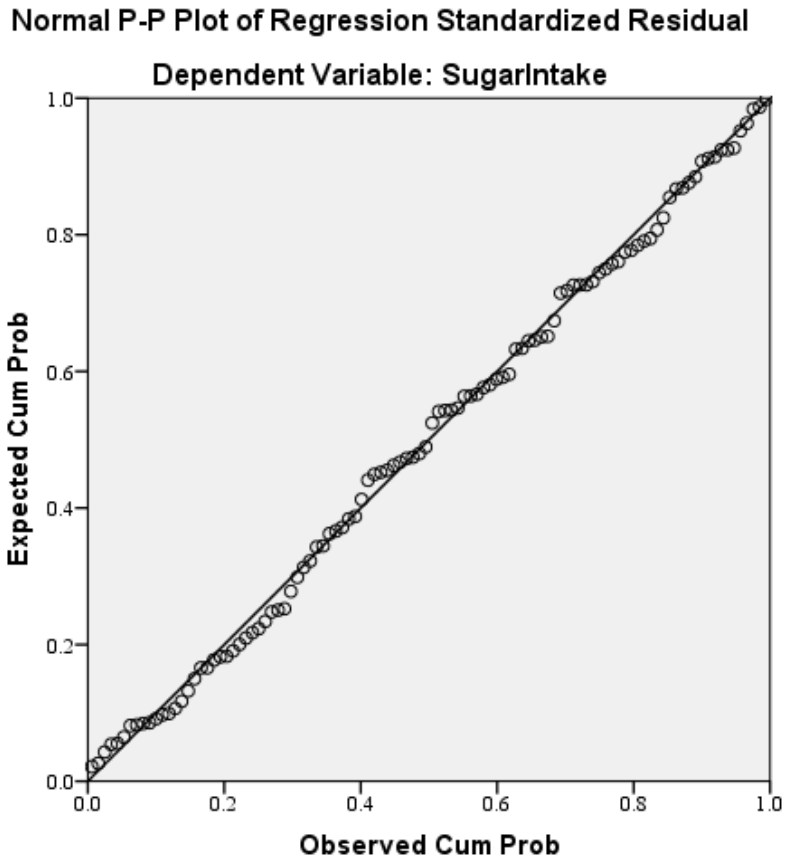

Figure 3. Normal P-P plot of regression standardized residual dependent variable: sugar intake

Collinearity

Collinearity statistics were run to ensure predictor variables did not exhibit singularity. Table 7 presents variance proportions, eigenvalues, and a condition index for each of the predictor variables in the model. Variance proportions of .50 and larger were considered problematic (Pedhazur, 1982, p. 303). Collinearity was spotted by finding two or more variables that have large proportions of variance (.50 or more) that correspond to

large condition indices (Pedhazur, 1982, p. 303). A rule of thumb was to label as large those condition indices in the range of 30 or larger (Pedhazur, 1982, p. 303). Based on examination of Table 7, there was no evident problem with collinearity.

Table 7

Collinearity Statistics for the Specified Model Containing Five Personality Predictors

Dimension	Eigenvalue	Condition Index	Variance Proportions					
			(Constant)	Extraversion	Agreeableness	Conscientiousness	Emotion	Openness
(Constant)	5.711	1	0.00	0.00	0.00	0.00	0.00	0.00
1	0.137	6.455	0.00	0.50	0.03	0.01	0.13	0.00
2	0.06	9.784	0.01	0.09	0.15	0.08	0.84	0.00
3	0.047	10.995	0.00	0.12	0.46	0.27	0.00	0.16
4	0.03	13.872	0.00	0.18	0.02	0.51	0.02	0.73
5	0.015	19.31	0.99	0.09	0.34	0.12	0.01	0.11

a Dependent Variable: Sugar Intake

Hypothesis 1 Results

Multiple linear regression was used to determine if there was a relationship between a model containing five personality traits (Openness, Conscientiousness, Extroversion, Agreeableness, and Neuroticism) and frequency of Millennials daily sugar intake. Results from multiple linear regression indicated that there was no significant relationship between Sugar Intake and the omnibus model containing the five personality traits; $R = .128$, *R-squared*, $F\ (5,100) = .331$, $p = .893$.

Table 8 displays descriptive statistics for the omnibus regression model. R depicted the strength of the relationship; R-square represented shared variance; *F* was the

value defined by between subjects error divided by within subjects' error. Sig represented the probability of error or likelihood of finding a similar R-squared if the regression test was conducted again on a similar sample.

Table 8

Omnibus Regression Model Displaying Descriptive Statistics for Model 1 and Individual Predictor Variables.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	F	Sig.
1	.128a	0.016	-0.033	0.70735	0.331	0.893
	Variable	Unstandardized Coefficients	Std. Error	Standardized Coefficients	*t*	Sig.(*p*)
1	(Constant)	2.755	0.496		5.552	
	Extraversion	0.03	0.05	0.066	0.611	0.542
	Agreeableness	0.029	0.063	0.048	0.457	0.649
	Conscientiousness	-0.052	0.062	-0.089	-0.834	0.406
	Neuroticism	-0.01	0.051	-0.02	-0.191	0.849
	Openness	-0.026	0.065	-0.045	-0.399	0.691

Note. Predictors: (Constant), Openness, Agreeableness, Emotional Stability, Conscientiousness, Extraversion

Dependent Variable: Sugar Intake

N = 106

Hypothesis 2 Results

Multiple Linear Regression and Zero-order correlation analysis were used to determine if there was a relationship between the personality trait, Openness, and frequency of Millennials daily sugar intake. Correlation coefficient from zero-order correlation analysis was $r = .053$, $p > .05$ which indicated no linear correlation between

sugar intake and the Openness variable. Results from multiple linear regression revealed that there was no relationship between the two variables; *Unstandardized Beta (B)* = -0.026, *T* = -.399, *p* = 0.691. Figure 4 displays the relationship between the two variables. As evidenced by the negative T value and slope of the regression line, the relationship was slightly negative and nonsignificant. According to the *Unstandardized Beta* coefficient of -.026, for every one unit increase in the value of Openness, Sugar Intake decreased by .026 points.

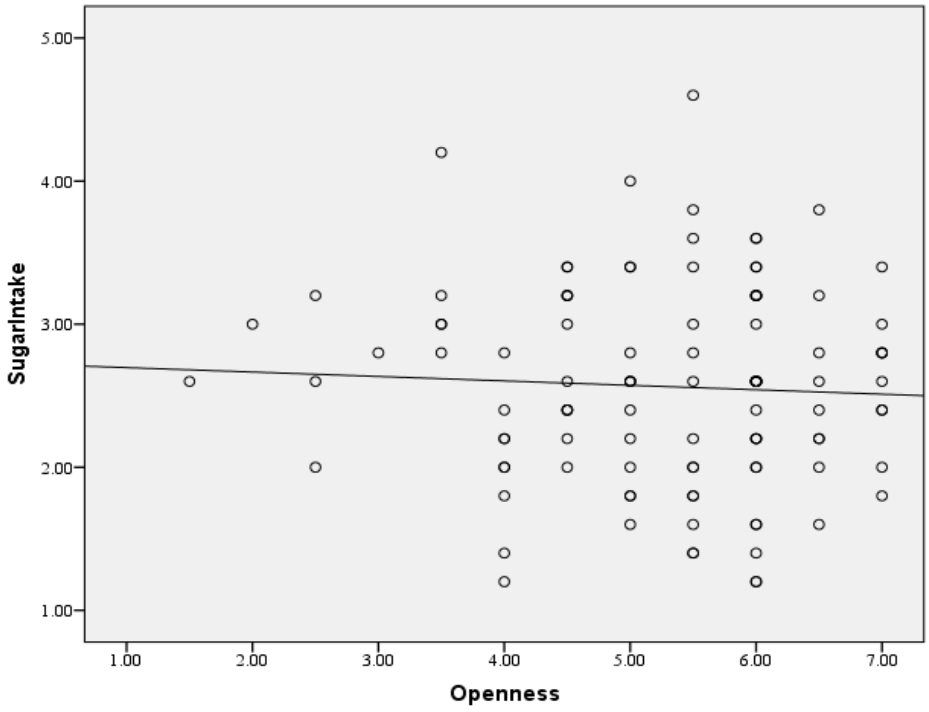

Figure 4. Scatter-dot graph displaying the observed relationship between openness and Sugar Intake.

Hypothesis 3 Results

Multiple Linear Regression and Zero-order correlation analysis were used to determine if there was a relationship between the personality trait, conscientiousness and frequency of daily sugar intake. Correlation coefficient from zero-order correlation analysis was $r = .101$, $p > .05$, which indicated no linear correlation between sugar intake and the Conscientiousness variable. Results from multiple linear regression revealed that there was no relationship between the two variables; *Unstandardized Beta (B)* = -0.052, $T = -.834$, $p = 0.406$. Figure 5 displays the relationship between the two variables. As evidenced by the negative *T* value and slope of the regression line, the relationship was slightly negative and nonsignificant. According to the *Unstandardized Beta* coefficient of -.052, for every one unit increase in the value of conscientiousness, Sugar Intake decreased by .052 points.

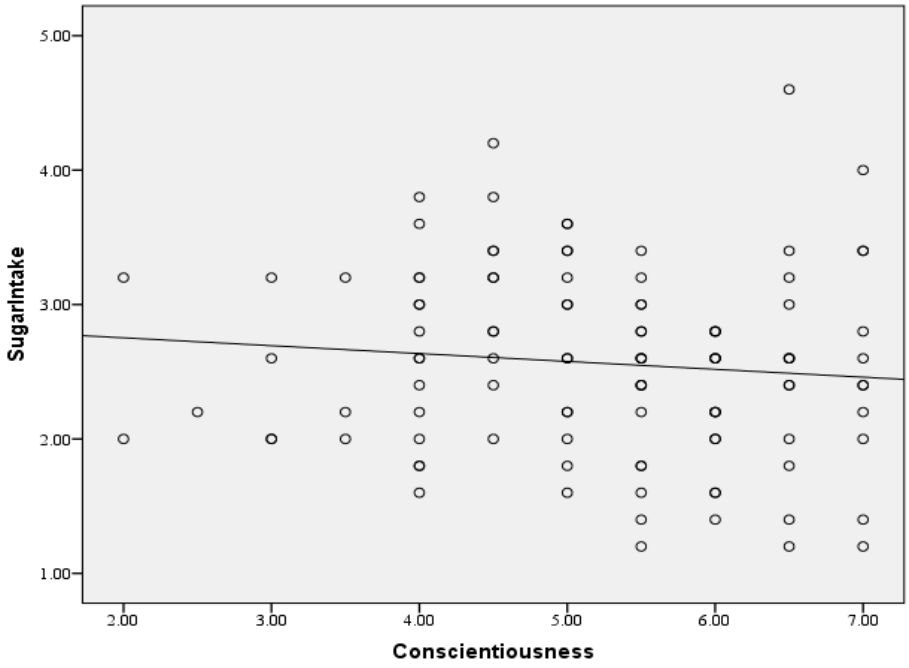

Figure 5. Scatter-dot graph displaying the observed relationship between conscientiousness and Sugar Intake.

Hypothesis 4 Results

Multiple Linear Regression and Zero-order correlation analysis were used to determine if there was a relationship between the personality trait, Extraversion and frequency of daily sugar intake. Correlation coefficient from zero-order correlation analysis was $r = .048$, $p > .05$, which indicated no linear correlation between sugar intake and the Extraversion variable. Results from multiple linear regression revealed that there was no relationship between the two variables; *Unstandardized Beta (B)* = 0.03, $T = .611$, $p = 0.542$. Figure 6 displays the relationship between the two variables. As evidenced by

the positive *T* value and slope of the regression line, the relationship was slightly positive and nonsignificant. According to the *Unstandardized Beta* coefficient of -.03, for every one unit increase in the value of Extraversion, Sugar Intake increased by .03 points.

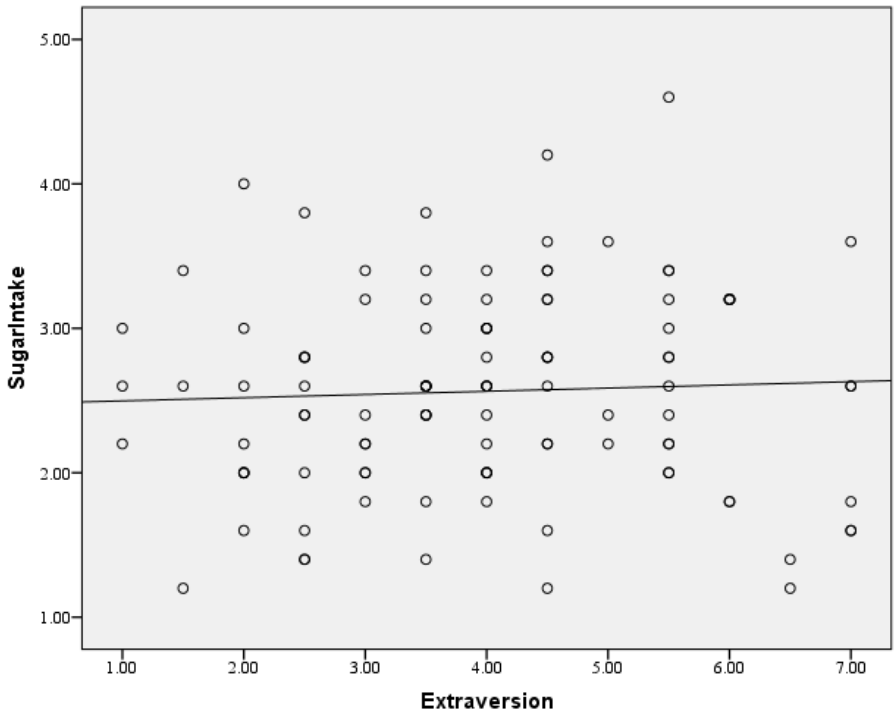

Figure 6. Scatter-dot graph displaying the observed relationship between extraversion and Sugar Intake.

Hypothesis 5 Results

Multiple Linear Regression and Zero-order correlation analysis were used to determine if there was a relationship between the personality trait, Agreeableness and

frequency of daily sugar intake. Correlation coefficient from zero-order correlation analysis was $r = .017$, $p > .05$, which indicated no linear correlation between sugar intake and the Agreeableness variable. Results from multiple linear regression revealed that there was no relationship between the two variables; *Unstandardized Beta (B)* = 0.029, *T* = .457, $p = 0.649$. Figure 7 displays the relationship between the two variables. As evidenced by the positive *T* value and slope of the regression line, the relationship was slightly positive and nonsignificant. According to the *Unstandardized Beta* coefficient of .029, for every one unit increase in the value of Agreeableness, Sugar Intake increased by .029 points.

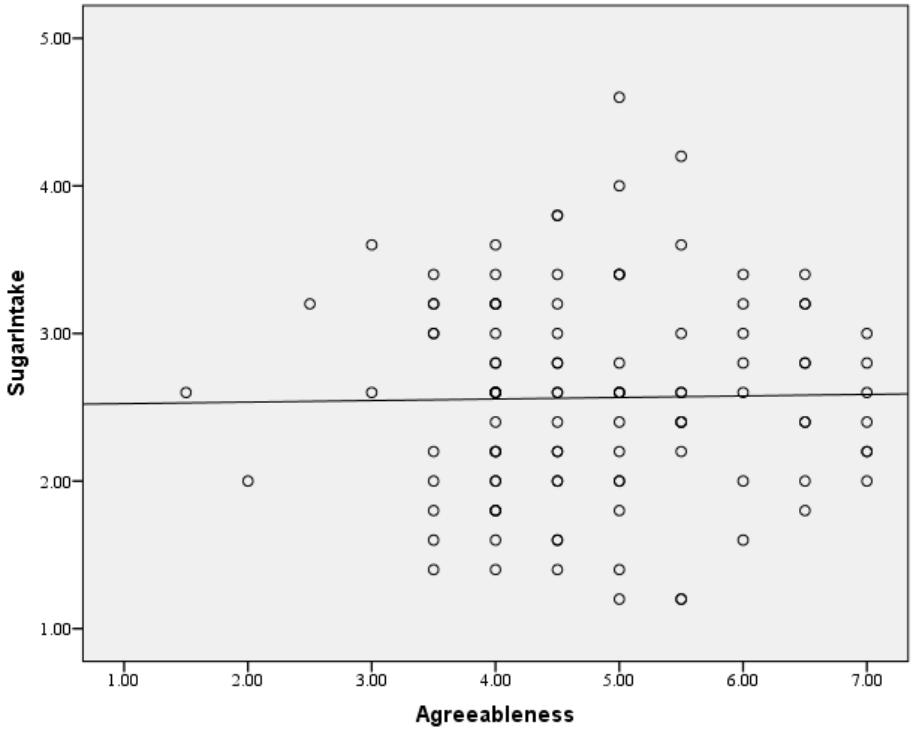

Figure 7. Scatter-dot graph displaying the observed relationship between agreeableness and Sugar Intake.

Hypothesis 6 Results

Multiple Linear Regression and Zero-order correlation analysis were used to determine if there was a relationship between the personality trait, Neuroticism, and frequency of daily sugar intake. Correlation coefficient from zero-order correlation analysis was $r = .044$, $p > .05$, which indicated no linear correlation between sugar intake and the Neuroticism variable. Results from multiple linear regression revealed that there was no relationship between the two variables; *Unstandardized Beta (B)* = -0.01, $T = -.191$, $p = 0.849$. Figure 8 displays the relationship between the two variables. As evidenced by the negative *T* value and slope of the regression line, the relationship was slightly negative and nonsignificant. According to the *Unstandardized Beta* coefficient of .01, for every one unit increase in the value of Neuroticism, Sugar Intake decreased by .01 points.

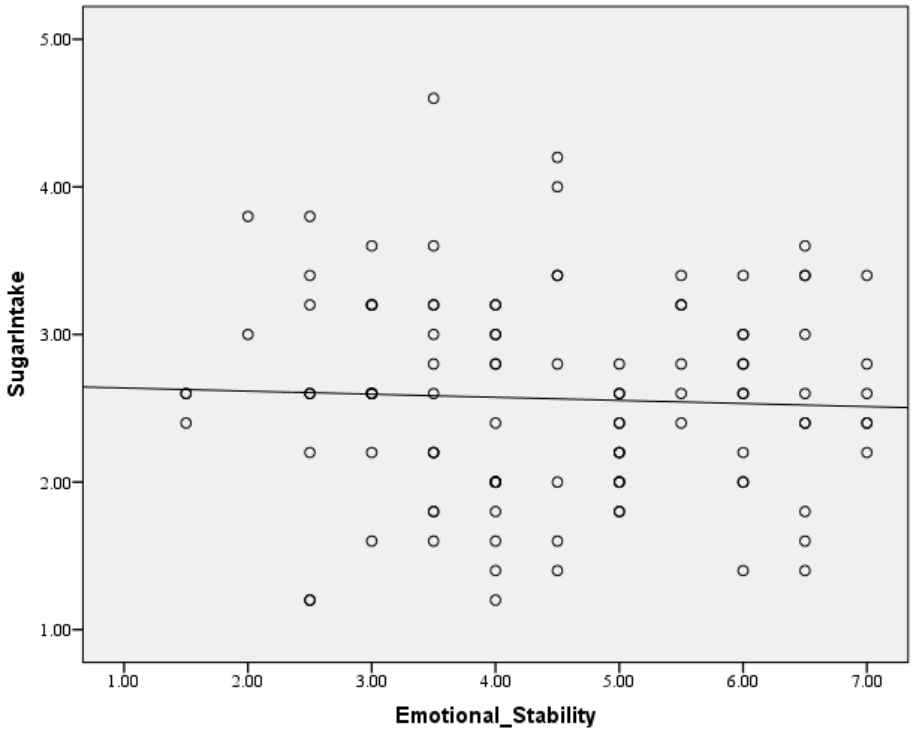

Figure 8. Scatter-dot graph displaying the observed relationship between neuroticism and Sugar Intake.

A zero-order correlation table using Pearson correlation was run to confirm findings of the multiple linear regression analysis. The analysis confirms findings where no significant relationship was found between sugar intake and the big five personality traits. Table 9 presents Pearson's correlation coefficients (*r*) for each possible set of variables.

Table 9

Zero-Order Correlation Analysis

Variable	Pearson Correlation					
	1	2	3	4	5	6
1 Sugar Intake	1	0.048	0.017	-0.101	-0.044	-0.053
2 Extraversion		1	-0.175	-0.028	-0.119	0.328
3 Agreeableness			1	0.157*	0.261**	-0.012
4 Conscientiousness				1	0.227**	0.291**
5 Neuroticism					1	0.175**
6 Openness						1

Note. * = p < .05, ** = p < .01.

Exploratory Analysis

An exploratory analysis was conducted to determine the relationship between a model containing the five personality indexes and sugar intake after controlling for age and gender. Sequential multiple regression was used to estimate model fit. Assumptions were examined for the model and all appeared to be within specified parameters.

Results indicated that after adding the five personality traits to a model containing Age and Gender, R-square change (R-square Change = .019, F_{change} (5, 9 8) = .401 was not significantly affected (*Significant (Sig) F Change* = .847). Therefore, after controlling for age and gender, no significant relationship between a model containing the five personality factors and Sugar Intake was found; p = .847. Table 10 displays the summary

statistics for the sequential regression model. Model 1 contained Age and gender while model 2 contained the five personality indexes. The dependent variable was Sugar Intake.

Table 10

Summary Statistics for Sequential Multiple Regression Analysis Controlling for Age and Gender

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.252a	0.064	0.045	0.67999	0.064	3.501	2	103	0.034
2	.287b	0.082	0.017	0.69009	0.019	0.401	5	98	0.847

a Predictors: (Constant), Age, Gender
b Predictors: (Constant), Age, Gender, Extraversion, Emotions, Conscientiousness, Openness, Agreeableness
c Dependent Variable:
Sugar Intake

Summary of Results

incorporated the correlations, and the ability of big five personality traits to predict sugar intake. Data analysis procedures were outlined in this chapter. Moreover, variables and statistical tests used to evaluate research questions 1 and 2 were explained in Table 2. Reliability analyses were explained for the Big Five Instrument as well as the Sugar Intake Survey showing both surveys to be sufficiently reliable. Data were collected and evaluated from a sample of 106 millennials. Participant demographics were analyzed and delineated. Frequency and percent statistics of participants' gender and age group

were outlined in Table 4 while frequency statistics for education and ethnicity were identified in Table 5.

Multiple Linear Regression analyses and zero-order correlation analysis were conducted to determine if there were significant relationships between variables of interest. A correlation between a model containing five personality traits (Openness, Conscientiousness, Extroversion, Agreeableness, and Neuroticism) and frequency of Millennials daily sugar intake were not significant. This chapter contained a description of the results of the data analysis that addressed the six research questions. Data collection and data screening were reviewed. Descriptive statistics were provided for the five predictor and criterion variables. The correlations were reviewed and further described. Regression models were also evaluated and explained in Chapter 4. Chapter 5 is a summary of results. Implications for social change will also be discussed. Lastly, recommendations for future research were presented.

Chapter 5: Interpretation

Introduction

The impact of sugar intake on health has continued to be a controversial topic since 2002. In the past few years, evidence has mounted that sugar intake harms health. Recent research has tied sugar with various forms of ailments including heart disease, diabetes, arthritis, and certain cancers. As part of the response to the global epidemic of diabetes and obesity as well as major threats to lives and well-being of populations across the globe, the World Health Organization and the Food and Agriculture Organization of the United Nations recommended limiting the poulation's intake of added sugars to less than 10 percent (Nishida, Uauy, Kumanyi, & Shetty, 2004).

There have been a succession of studies investigating obesity and mental health conditions, however, diminutive research has been led with respect to the association among trait personalities including openness, conscientiousness, extraversion, agreeableness, and neuroticism, along with their sugar intake (Halfon, Larson, & Slusser, 2013; Nichele & Yen, 2016). It is important to provide guidance for health professionals as well as the general public on ways to consider reducing sugar intake. As such, to fill the gap in the literature, six hypotheses were developed to answer the question: What is the relationship between the big five personality traits and daily sugar intake?

Research Design and Rationale

A quantitative approach was used to gather data. A cross-sectional survey was used to assess the correlation among the variables. Purposive sampling via

SurveyMonkey panels was used to collect data from eligible participants. The design represented a plan to collect specific empirical evidence, identify data variance, and measure variance in the dependent variable as a function of predictor variables. The purpose of this quantitative study was to test the theory of the Health Belief Model (HBM) as it relates to sugar intake and personality traits. The aim was to discover what effect personality schemas have on Millennials' sugar intake. The dependent variable, sugar intake, is a continuously scaled variable while the predictor variables are also continuously scaled.

Multiple linear regression analyses and zero-order correlation analysis were conducted to determine if there were significant relationships between variables of interest. A correlation between a model containing five personality traits (openness, conscientiousness, extroversion, agreeableness, and neuroticism) and frequency of Millennials daily sugar intake were not significant. That is, the five dimensions of personality were not significantly associated with Millennials daily sugar intake.

SPSS 23.0, multiple regression was used to determine if there was a relationship between a model containing five personality traits (openness, conscientiousness, extroversion, agreeableness, and neuroticism) and frequency of Millennials daily sugar intake. Results indicated that there was no significant relationship between sugar intake and the omnibus model containing the five personality traits; $p = .893$. Moreover, the five follow-up hypotheses that examined the univariate relationship between each of the five personality traits and daily sugar intake were not significant.

Interpretation of the Findings

Personality traits have a significant impact on an individual's behavior (McCrae & Costa, 1992, p. 367). Understanding how personality traits relate to sugar intake in Millennials is just as important as understanding the personality characteristics that may improve identification of an underlying issue that has yet to be understood. In a study conducted by Sutin, Ferrucci, Zonderman, and Terracciano (2011), conscientiousness and neuroticism are associated with how an individual observes their personal health and welfare and the way they attain good health and prevent illness. These two main traits were acknowledged to have further substantial bearing on the identified health behaviors compared to others, predominantly with respect to weight. People that attain a high score with regard to the quality of conscientiousness have a tendency to be leaner and participate in improved healthy options (Sutin et al., 2011). As a result of their inclination to have more organization and order accompanied by self-discipline, a healthy weight is also supported in addition to improved lifestyle options (Sutin et al., 2011).

In comparison, people who attain a high score with regard to the trait of neuroticism have a tendency to be chaotic throughout several parts of their life, including their health (Sutin et al., 2011). Sutin et al. (2011) explained that conceivably, as a result of the higher level of pessimism, the individuals' score in neuroticism tend to maintain this behavior throughout all parts of their lives. Weight is considered one of the advanced disordered states with individuals who score high in neuroticism. That is, high beuroticism scores revealed figuratively high values on both spectrums of anorexic and

morbidly obese (Sutin et al., 2011). In theory, Sutin et al. (2011) highlighted that this is attributable to unwholesome eating behaviors and more sedentary lifestyle choices.

In addition, Sutin et al. (2011) identified associations with elevated impulsiveness and reduced self-control to be traits that steadily designated elevated weight analyses. The researchers credited the study results to individuals possessing traits that did not resist temptation (like sugar) and implementing the control necessary to sustain a fit weight. Therefore, the identified people were consistently more probable to participate in further conducts that advance the hazards to their mortality including "binge eating, being physically inactive, smoking, drinking, and abusing drugs" (Sutin et al., 2011, p. 11).

However, my findings did not directly link increased sugar intake with any of the Big Five personality traits including conscientiousness or neuroticism. Although research suggested that a lower level of conscientiousness would be related to a higher incidence of sugar intake and high levels of neuroticism would be related to higher levels of sugar intake, my findings did not support this assertion.

Limitations of the Study

Several limitations in this study may have contributed to the nonsignificant findings. Specifically, sample size, instrument sensitivity, and data collection strategy may have constrained variation of data. For quantitative data analysis, it is important to ensure that type of participant is well defined and the quantity of participants is sufficient enough to detect a relationship between variables. For this study, sample size was determined by a formal power analysis. When conducting a power analysis it is very

beneficial to refer to research for an appropriate effect size. For this study effect size was estimated based on Cohen's standards (Cohen, 1988) due to lack of research on the topic. Effect size was estimated to be .15 (medium), but actual effect size was less than .08. This difference may have contributed to not having enough participants in the study. Further, participants were obtained from SurveyMonkey, which is a for profit entity that entices individuals to participate in studies for a benefit. Although the benefit is small and not directly given to participants, a confounding effect may have been present. That is, SurveyMonkey participants may be well seasoned and very familiar with common personality traits inventories. This seasoning may be dulling the variation of responses and can be, perhaps, contributing to an effect called regression toward the mean. This theory, developed by Galton in 1886, suggested that extremes do not survive (Galton, 1886). As applied to this study, if participants are repetitively surveyed (as in the case of SurverMonkey participants) extreme scores are likely to creep toward the mean—extreme scores do not survive. This phenomenon effectively reduces the variation in scores and therefore makes it harder to find a relationship if one exists in the data. To mitigate this affect, researchers should ask participants (especially SurveyMonkey participants) if they have taken a personality inventory in the past. Most likely they have and suggest that the greater population in general may be over surveyed.

Another consideration is the fact that this study was conducted using a cross-sectional design. This means that participants were asked to complete the daily sugar intake survey at a single time point rather than obtaining data across time. This strategy

may have reduced the likelihood of obtaining true daily sugar intake values. This means that participants may not have self-reported sugar intake due to extemporaneous factors that where affecting their attitudes at the time the data was collected.

Moreover, sugar intake may be a sensitive subject to some meaning that millennials may, collectively, view sugar intake as culturally forbidden. One can look at the rise in health care products and *natural foods* to understand a partial resistance to products with processed sugar in it. Although participants may be consuming processed sugar, their willingness to honestly divulge the information may be affected. Further, cognitive dissonance may also be affecting their ability to fully divulge sugar consumption. That is, they may be consuming the processed sugar but, reporting low consumption to maintain a sense of self—as perceived by others.

Recommendations

For researchers, three recommendations are presented. The sample size for this study was 106 and posthoc power was calculated to be around 20%. This suggests that a sufficient sample size was not obtained given the characteristics of the data. This means that a larger sample may have yielded a significant finding. The effect size for the study was around .10 meaning that approximately 900 participants would have been necessary to find a significant relationship between specified variables. As such, it is recommended that the study be replicated with a larger sample size. It is also recommended that researchers use the long version of the Big Five Personality trait inventory rather than the 30-item version to obtain greater clarity of the individual personality traits. This strategy

may help to parse out, in finer detail, personality variations associated with each participant.

Researchers should consider measuring daily blood sugar intake directly rather than indirectly. This means that an average daily glucose level could be obtained to replace self-reported data. This would reduce the error associated with the data that was collected in this study.

Researchers could also collect daily sugar intake over time rather than at a point in time. This study employed a cross-sectional data collection strategy rather than collecting data over time. Collecting self-reported data over time may eliminate the effect that personality has on reporting sensitive information like eating habits.

Implications

This study findings have several implications for social change. Foremost, it is significant to have scientific understanding if a there is a significant relationship between personality traits and daily sugar intake in effort to support individuals and their reduction of daily sugar intake. With solid evidence to support that keeping sugar intake at less than 10 % of total energy intake reduces overall risk of obesity, tooth decay, as well as obesity, a new World Health Organization guideline recommends a further reduction to below 5 % or about 25 grams (6 teaspoons) per day for additional health benefits (WHO, 2016). Additionally, scientific interpretation of a relationship between daily sugar intake and personality traits may prove helpful for the generation of constructive educational materials for the general public, students, as well as health

professionals to develop robust preventative programs in practice (Rejeski, Ambrosius, Brubaaker, & Focht, 2003). Although the study conducted found no relationship between personality traits and daily sugar intake, this does not mean that a relationship does not exist. Rather, it simple means that given the research protocol and limitations associated with sample size, instrument sensitivity, data collection strategy, the null hypotheses could not be rejected. Therefore, based on the narrow definition of this study, specific personality traits were not linked to sugar intake.

Millennials may benefit from this study since consumption of processed sugar may simply be related to prevalence and availability of the product rather than any one type of personality trait. Despite theoretical discourse that a relationship might exist, the results observed in this study suggest that a relationship does not exist. Furthermore, cultural norms and family traditions may drive consumption more that any one specific personality does.

Recommendations for Practice

Practitioners should, perhaps, consider how personality traits may be affecting eating habits including consuming food with high sugar content. Practitioners should not necessarily discount past research that suggest a relationship does exist between personality and eating habits, rather, they should treat individuals on an individual basis.

Conclusion

The purpose of the study was to investigate if there is a relationship among millennials big five personalities that include (a) openness, (b) conscientiousness, (c)

extraversion, (d) agreeableness, and (e) neuroticism, and one's daily sugar intake. The aim of the study was to test whether the independent variables (openness, conscientiousness, extraversion, agreeableness, neuroticism) predicts the dependent variable (daily sugar intake).

A cross sectional, quantitative research design using Likert-type survey was used to obtain data from millennials. Findings were not significant, meaning that no relationship between personality traits and daily sugar intake was found. It was inferred that the nonsignificant findings may have been to the low sample size and lack of variation in the data. Researchers are encouraged to replicate the study with a larger sample size and similar study design in various populations.

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Appendix A

NEO-PI-R Broad Domains of Personality

Five-factor model of personality Inventory – How it Works

The FFM (NEO-PI-R Broad Domains of Personality) has a total of 10 questions per personality dimension. Respectively, elements of the FFM are scaled at the interval level, where reply choices range from 1-6, with 1=strongly disagree, 2 = disagree, 3 = disagree more than agree, 4=agree more than disagree, 5 = agree, and 6= strongly agree.

The five-factor representation of personality (FFM) consists of five expansive trait measurements commonly represented as the Big Five: extraversion, agreeableness, conscientiousness, neuroticism (on occasion termed by its polar contrary, emotional stability), and openness to experience (on occasion termed intellect). Trait classification must convey a logical outline for differentiating, comparing, and designating the conduct, emotional, and observed individualities of people.

Five predictor variables and one dependent variable are specified in Figure 1. Within the representation, unstandardized beta (β) depicts the slope of the regression line or the change in the dependent variable for each one-unit variation in the predictor variable. Reliability and validity of the big five instrument were assessed via Cronbach's alpha and factor analysis. The following scale applies:

The Big Five

Neuroticism

10-item scale (Alpha = .86) + keyed

1. Often feel blue.
2. Dislike myself.
3. Am often down in the dumps.
4. Have frequent mood swings.
5. Panic easily

– keyed

1. Rarely get irritated
2. Seldom feel blue.
3. Feel comfortable with myself.
4. Am not easily bothered by things.
5. Am very pleased with myself.

Extraversion

10-item scale (Alpha = .86) + keyed

1. Feel comfortable around people.
2. Make friends easily.
3. Am skilled in handling social situations.
4. Am the life of the party.
5. Know how to captivate people.

– keyed

1. Have little to say.
2. Keep in the background.

3. Would describe my experiences as somewhat dull.
4. Don't like to draw attention to myself.
5. Don't talk a lot.

Openness to Experience

10-item scale (Alpha = .82) + keyed

1. Believe in the importance of art.
2. Have a vivid imagination.
3. Tend to vote for liberal political candidates.
4. Carry the conversation to a higher level.
5. Enjoy hearing new ideas.

– keyed

1. Am not interested in abstract ideas.
2. Do not like art.
3. Avoid philosophical discussions.
4. Do not enjoy going to art museums.
5. Tend to vote for conservative political candidates.

Agreeableness

10-item scale (Alpha = .77) + keyed

1. Have a good word for everyone.
2. Believe that others have good intentions.
3. Respect others.

4. Accept people as they are.
5. Make people feel at ease.

– keyed

1. Have a sharp tongue.
2. Cut others to pieces.
3. Suspect hidden motives in others.
4. Get back at others.
5. Insult people

Conscientiousness

10-item scale (Alpha = .81) + keyed

1. Am always prepared.
2. Pay attention to details.
3. Get chores done right away.
4. Carry out my plans.
5. Make plans and stick to them.

– keyed

1. Waste my time.
2. Find it difficult to get down to work.
3. Do just enough work to get by.
4. Don't see things through.
5. Avoid my duties.

Appendix B

2010-2011 Northern Ireland Sugar Intake Health Survey

Daily Sugar Intake (DSI) is measured via a 5-point Likert-type scale that is described by frequency of behavior, but anchored by numerical values; where, frequency of behavior is categorized as: 1 = *Never*, 2 = *Rarely*, 3 = *Occasionally*, 4 = *Frequently*, and 5 = *Always*. Five semantic phrases are used to describe behaviors related to sugar intake. Respondents were asked to select a numerical response that best fits their frequency of the behavior. Lower values mean less frequent sugar intake while higher values represent greater frequency of sugar intake. The scale is considered an ipsative scale where respondents are forced to select an option; an escape option is not provided. Further, the scale is assumed to be an interval level scale since an equal relationship between response options exists (i.e., numerical values). Scores from the five questions were summed and averaged to obtain an overall sugar intake score for each participant. After averaging the score for each participant across the five questions, the minimum score is 1 while the maximum score is 5. Participants were asked to complete each question to the best of their ability. The following questions apply:

Personal Sugar Intake Questionnaire [Part 2]

PART III

For each of the statements below, choose the answer that most accurately describes your're

*** 1. I choose foods low in sugar.**

Always | Frequently | Occasionally | Rarely | Never

*** 2. I eat snacks, especially after dinner.**

Always | Frequently | Occasionally | Rarely | Never

*** 3. When choosing the food I eat, I consider its nutritional value.**

Always | Frequently | Occasionally | Rarely | Never

*** 4. I add at least 2 spoons sugar into my coffee or tea.**

Always | Frequently | Occasionally | Rarely | Never

*** 5. I add sugar to food while cooking and/or after it is served.**

Always | Frequently | Occasionally | Rarely | Never

Appendix C

Demographic Survey

1. Gender
    - Male
    - Female
2. Age_____
3. Education: How many years of formal education have you completed
    - High School (12 years or less)
    - 2 years of College (14 years)
    - Bachelor's Degree (16 years)
    - Master's degree (18 years)
    - Greater than Master's (> 18 years)
4. What ethnicity do you identify with?
    - Asian
    - African American
    - Caucasian
    - Hispanic
    - Other

Appendix D

Permission to use 2010-2011 Northern Ireland Sugar Intake Health Survey

From:

Sent: Tue 6/14/2016 3:00 AM

Good Morning:

Many thanks for your email.

The FSA has no objections to you using our surveys as part of your dissertation.

Thank you.

Marketing / Communications Officer

Appendix E

Invitation to Participate in a Research Study Survey

Walden University, School of Public Health, USA

November 2016

Good morning!

This letter is an invitation to consider participating in a study I am conducting as part of my Doctoral degree in Public Health at Walden University under the supervision of Dr. John Nemecek. The purpose of this study is to examine if sugar intake is related to personality traits in the Millennial population.

Participation in this study is voluntary. It will involve a survey of approximately 30 minutes in length to take place online. You were selected to be part of this project because you have been identified as over 18 years old, at least 18 but no more than 35 years old, must be willing to participate, residing in the United States of America. Your time to participate in this brief web survey may promote positive social change by helping understand the role personality traits play in determining sugar intake, which in turn help to reduce sugar intake so as to reduce the associated health risks of consuming high sugar.

Your answers will be completely confidential. Anonymous methods will be applied for the study. The results of the survey will be reported in a summary format. To complete the survey online, please go to the URL below. Thank you in advance for your participation in this important project. If you have any questions about the administration of the survey, please contact Flora Gashi by email at

Sincerely,

Flora Gashi, Walden University Researcher