5-2019

Alcohol Use, Dietary, and Exercise Behaviors: A Latent Profile Analysis of Young Adult Lifestyle Behaviors

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A Latent Profile Analysis of Young Adult Lifestyle Behaviors

A thesis submitted in partial fulfillment
of the requirements for the degree of
Master of Sciences in Human Environmental Sciences

by

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University of Arkansas, Fayetteville
Bachelor of Arts in Psychology
2017

May 2019
University of Arkansas

This thesis is approved for recommendation to the Graduate Council.

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Abstract

As individuals enter adulthood, their lifestyles and lifestyle behaviors begin to change drastically. These lifestyle behavior changes in emerging adulthood provide a foundation for future health behaviors that often persist through all of adulthood. The aim of this study was to use Latent profile analyses (LPA) to discover distinct profiles of homogenous groups of young adults based on alcohol, diet, and exercise behaviors. Overall, five distinct profiles for both males and females were identified: Moderates, Unhealthy Eaters, Medium Drinkers, Healthier Eaters and Exercisers, and Heavy Drinkers. Heavy Drinkers and Unhealthy Eaters were the highest risk groups and reported the highest number of days where their mental and physical health was poor. Medium Drinkers also reported more days where their mental health was poor relative to the Healthier Eaters and Exercisers. Future work should examine the motivations of individuals falling into these groups to identify mechanisms to intervene in order to promote healthy lifestyles as these young adults move into adulthood.

Acknowledgements

I would like to thank Jennifer Becnel, Dylan Martinez, Zachary Giano, Sabrina Trudo, and Amanda Williams for assisting me in this achievement.

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Introduction

Healthful eating and exercise habits are essential for health promotion and disease prevention. One of the most common results of unhealthy habits is obesity, and rates have been increasing around the world (James, 2008). In the United States, it is estimated that 39.6% of adults and 18.5% of children and adolescents are obese (National Center for Health Statistics, 2017; Mitchell, Catenacci, Wyatt, & Hill, 2012). These percentages have steadily increased by 9.1% for adults and 4.6% for youth since 1999-2000 (NCHS, 2017). Obesity is a health hazard in itself due to the high likelihood of physical and psychological comorbidities (Simon et.al, 2006). While it can be brought on by a number of factors, obesity is a basic function of energy imbalance that results from excess energy intake being stored as fat (Hruby & Hu, 2015).

One important influencing factor of obesity is sedentary behavior. Sedentary behavior is considered as any activity with low metabolic energy expenditure (Gonzalez, Fuentes, & Marquez, 2017). Sedentary behavior is typically a matter of sitting or lying down too often, and therefore a lack of exercise. One of the most salient indicators of sedentary behavior over the last 60 years is watching television, which has undoubtedly contributed to the rising adiposity prevalence (Qi et al., 2012). An unhealthy ratio of too much sitting and too little exercise is a risk factor for not only obesity, but also the comorbidities of obesity such as type 2 diabetes, cardiovascular disease, and even some types of cancer, as well as poor psychosocial health outcomes (Hamilton et al., 2008).

Another behavior with a definite propensity for health hazards is excessive alcohol consumption, such as binge drinking and frequent use. Excessive alcohol use can lead to the development of chronic diseases and other serious health problems such as hypertension, heart disease, liver disease, stroke, and cancer of the breast, mouth, throat, esophagus, liver, and colon

(CDC, 2018). Excessive alcohol consumption accounts for 1 in 10 deaths among working-age adults in the United States (Stahre et al., 2014). While these behaviors are unhealthy and can set an individual on a trajectory of adverse health consequences, little is known about how exercise, sedentary behavior, risky alcohol use, and eating behaviors cluster together to predict weight in emerging adulthood. This is a critical gap considering emerging adulthood is an important period for the development of lifelong health behaviors (Riggs-Romaine, 2018).

Emerging Adulthood as a Developmental Period

A recurring theme found in the examination of deleterious behaviors across age groups is that emerging adulthood is both a time of increased risk-taking behaviors and a period for the development of health behaviors (Riggs-Romaine, 2018). Emerging adulthood, the age range described by Arnett (2000) as 18 to 25 years old, has been found to be the age range at which health risk behaviors peak in many facets. Moving on to college or other career endeavors after high school is generally the largest transition young adults make in their lives. With these transitions comes an introduction to brand new environments and behaviors common to the adult experience. This typically involves moving out of parents' homes and beginning life on their own. Young adults are forging new social networks while taking on increasingly mature roles and responsibilities, both economic and academic (Taylor, Doane, & Eisenberg, 2013). Those who continue their academic careers in college often face rigorous academic schedules and increased stress (Baer, 2002). The stress associated with this transition can exacerbate the engagement in unhealthy eating and alcohol use, especially when coupled with a drastic decline in parental supervision (Bae, Kivlahan, & Marlatt, 1995).

Emerging adults are likely to engage in risky eating and drinking behaviors due to pressures to engage in what is popular behavior as well as explore their identity by trying out

different behaviors (Burke, 2010). As emerging adults are just learning to develop life-long health behaviors, gaining a better understanding of how these health behaviors cluster together will aid in the creation of intervention or prevention programs to promote healthy, life-long behaviors and bring awareness to health hazards.

Exercise Behaviors in Emerging Adulthood

There exists a pattern wherein exercise becomes of less importance in this transitionary period of young adults. Over the 12 years from adolescence to early adulthood, physical activity decreases an average of 24%, which represents the most dramatic decline in physical activity across a person's life (Kwan et al., 2012). The transition into post-high school is in particular a one-time period when individuals become much less active (Kwan et al., 2012). National physical activity guidelines recommend that adults engage in at least 150 weekly minutes of moderate-intensity activity or 75 weekly minutes of vigorous-intensity aerobic activity for healthy living (PAGAC, 2008). Of all 18 to 39 year olds in a recent sample, 62% were not meeting minimal physical activity recommendations (Valle et al., 2015).

Dietary Intake in Emerging Adulthood

As emerging adults transition to adulthood, they experience more autonomy in how they can spend their time and money. In addition to forgoing exercise more often, emerging adults typically make unhealthy diet choices, while prioritizing convenience and taste of food over all other choice factors (Abraham, Noriega, & Shin, 2018). According to the Centers for Disease Control and Prevention (CDC), only 1 in 10 American adults meet the federal recommended guidelines for fruit and vegetable consumption (CDC, 2018). Additionally, adults 18-30 years have reported the lowest amount of fruit and vegetable consumption compared to other age categories (CDC, 2018). In a recent study by Cha and colleagues (2014), a significant positive

predictor of health consideration was understanding nutritional requirements and comprehending health-related information in order to make appropriate health-related decisions (Huizinga et. al, 2009). Healthy diets emphasize healthful unsaturated fats, whole grains, protein, and most importantly fruits and vegetables, while limiting consumption of trans-unsaturated fats, highly refined grains, and sugary beverages (Skerrett, & Willett, 2010).

Alcohol Use in Emerging Adulthood

In addition to commonly opting for convenient, inexpensive, and often unhealthy food choices, young adults also typically have easy access to alcohol through legal or illegal means, depending on their age (Abraham, Noriega, & Shin, 2018; Yoon el. al, 2017). In a sample of college students in the United States, half of them under the legal drinking age of 21 obtained alcohol very easily. Younger drinkers are also much more likely to drink to excess (i.e., binge drink) and experience a greater degree of the negative consequences of drinking relative to their elder counterparts (Wechsler et. al, 2002). Binge drinking is classified as drinking four or more standard drinks for women and five or more standard drinks for men in the span of about two hours, which is an approximation of the volume necessary to raise one's blood alcohol level to 0.08 mg per 100mL of blood (NIAAA, 2006). Young adults between the ages of 18 and 24 years have the highest rates of alcohol use and the largest proportion of problem drinkers (Cservenka & Brumback, 2017). In addition to these more immediate adverse outcomes, binge drinking has long-term detriments to health as well, such as severe liver damage and kidney dysfunction. There is much epidemiological evidence demonstrating that binge drinking exacerbates the liver damage in chronic alcoholics for which they are receiving treatment (Llerena et al., 2015).

Binge drinking has been associated with poor diets, unhealthy weight control, body dissatisfaction, and sedentary behavior (Nelson, Lust, Story, & Ehlenger, 2009). However, the relationship between alcohol consumption and sedentary behavior is controversial, as several studies have found a positive correlation between alcohol consumption and physical activity while others find a negative relationship (Barrett, 1995; Barry, 2011; Piazza-Gardner, 2012; Dodge, Clarke, & Dawn, 2016). It is hypothesized that this is a result of differing health knowledge and motivation to refrain from gaining weight (Nelson, Lust, Story, & Ehlinger , 2009).

Weight and Weight Gain

This newfound autonomy often results in unhealthy outcomes in young adults, including unwanted gaining of weight (Dietz, 2017). Emerging adults had the highest increase in obesity prevalence (Mokdad et. al, 1999), and obesity among young adults has more than doubled in the past 30 years with 70.2% of adults in the United States being overweight or obese (Nelson et. al, 2008; CDC, 2018). It is normative for people to gain weight as they age (CDC, 2018). However, the transition from adolescence to adulthood is a period of particularly increased risk of weight gain. This gaining of weight in adulthood is largely brought on by an increasingly sedentary lifestyle as well as excessive and/or unhealthy food consumption.

There is also evidence to suggest that alcohol use plays a role in weight gain in emerging adults. In a study by Lloyd-Richardson (2008), moderate-risk drinkers demonstrated significant BMI increases in emerging adulthood relative to non-drinkers and low-risk drinkers. These heavier drinkers were more likely than low-risk drinkers to report increased appetite after drinking. Additionally, almost half of the participants surveyed reported making unhealthy food choices and overeating after drinking alcohol (Lloyd-Richardson, 2008). Not only are extra,

non-nutritious calories entering the diet via copious alcohol consumption, but the unhealthy food choices that often accompany drinking also play a large part in these health changes. As alcohol consumption increases, so does caloric intake (Hillers, 1985). Additionally, as alcohol consumption increased, there was a decrease in the percentage of energy derived from the essential macronutrients of protein, fat, and carbohydrates, therefore the nutritional quality of the diet declined (Hillers, 1985). It is important to note just how caloric alcohol really is in relation to these macronutrients: while protein and carbohydrates both have 4 calories per gram and fat has 9 calories per gram, alcohol has 7 calories per gram (Carreiro et al., 2016). Alcohol consumption has been shown to affect mood and disinhibit the food consumption choices of normally restrained and responsible eaters (Polivy, 1976). Heavy drinkers, particularly male heavy drinkers, have less favorable nutritional intake than moderate drinkers and non-drinkers (Fawehinmi et. al, 2012)

Weight-Conscious Drinking

Weight gain and/or the fear thereof among young adults has led to development of certain compensatory behaviors surrounding heavy episodic drinking, such as preemptive calorie restriction before alcohol consumption, as well as physical activity of various levels of intensity. These potential problematic behaviors of weight-conscious drinkers have been labeled by some researchers as "drunkorexia" (Eisenberg & Fitz, 2014; Wilkerson et. al, 2017). This condition has been coined to describe the phenomenon of drinkers who generally want to avoid the outcome of weight gain from excessive drinking. This can be done by excessive exercise, restricting food intake prior to drinking, or even the use of laxatives or purging behaviors (Eisenberg & Fits, 2014).

One common behavior of weight-conscious drinkers is the intentional restriction of calories before a heavy drinking episode (Research Society on Alcoholism, 2016). Burke (2010) found that of the 14% of students who restricted caloric intake before drinking, just 6% reported this behavior was to avoid gaining weight. The other 10% reported this behavior was simply to enhance the alcohol's intoxicating effects. It seems that rather few young drinkers are aware of the influence of heavy drinking episodes on increased appetite and decreased inhibition in food choice and consumption.

Another common behavior of weight-conscious drinkers is physical exercise. One literature review showed that 88% of studies with college students and 75% of studies with nonstudent adults reported a positive relationship between physical activity and alcohol use (Dodge, 2016). This is an intriguing discovery of a positive relationship between what would typically be considered one pro-health behavior and one health risk behavior, contrary to the aforementioned findings of Nelson and colleagues (2009). All ages of alcohol consumers have been shown to be more active than nondrinking peers. In fact, many studies posit a dose-response relationship between physical activity and alcohol consumption, indicating that physical activity level increases as drinking increases (Piazza-Gardner, 2012; Barry & Piazza-Gardner, 2011). The intensity of compensatory physical activity has been shown to vary among drinkers. In one study, 11.2% of college students reported behaviors of weight-conscious drinkers based on physical activity of moderate intensity, while 14.7% reported vigorous intensity physical activity as their compensatory behavior for drinking (Wilkerson, 2017). As mentioned previously, weight gain is the most salient and immediate effect of excessive drinking. There is a 50-100% increase in risk of developing an alcohol use disorder in those who participate in just a low intensity leisure time physical activity, as compared to those who exude

a moderate to high level of physical exhaustion during leisure time physical activities. Being sedentary in leisure time is also a risk factor for developing an alcohol use disorder (Ejsing, Becker, Tolstrup, & Flensborg-Madsen, 2015).

Although less common than the aforementioned calorie restriction and increased exercise, weight-conscious drinkers have exhibited more extreme behaviors to compensate for the calories in alcohol, such as intentional purging after binges. Moreover, female college drinkers are more likely to engage in these bulimic-type behaviors than their male counterparts (Research Society on Alcoholism, 2016).

Gender

Few research teams have examined eating, exercise, and alcohol use behaviors between genders, but the few that have find contradictory results. Peralta (2015) suggested that men and women do not differ significantly in their compensatory weight-control behaviors, however, recent binge drinking, other substance use, and masculine orientation were positively correlated with behaviors of weight-conscious drinkers (2015). Wilkerson (2017) posited that there was no difference found between genders as a predictor of behaviors of weight-conscious drinkers, but BMI was a predictor of those behaviors. This contradicts Burke and colleagues (2010), who found no association between BMI and alcohol use behaviors, but did find differences between genders. Burke (2010) found that of the students who restricted caloric intake on days they knew alcohol consumption would occur, 70% of those who restricted calories to avoid gaining weight were female and 68% of those who restricted calories to feel alcohol's effects better were male. These proportions could be partially explained by the slightly unbalanced gender makeup of the sample, however, Eisenberg and Fitz (2013) suggested that women engage in these "drunkorexic", weight-conscious drinking behaviors more often than men, and it is because of

their higher motivation for weight control. Bryant (2011) also posited that female students engage in exercise and dietary restriction more than male students to control calories both proactively and reactively from drinking episodes, however, Barry (2013) found a positive relationship between exercise and alcohol use only for males. Weight loss behaviors were positively associated with drinking for both female and male students, but females had the stronger association. It is possible that male and female students have different methods and motivations for weight-conscious drinking behaviors.

Gaps in Previous Research

Extant research has focused primarily on college students while simply describing the behaviors of one specific type of drinker without taking into account the various profiles that may exist for emerging adults. Studies that have investigated how these behaviors are interrelated and examined for differing profiles have utilized cluster analysis. Cluster analysis is a statistical method that has been useful in previous research in identifying homogenous groupings of data with no previously known structure. While cluster analysis is useful in determining groups of individuals based on their similarities across many factors, (Jimenez, Green, Subramanian, & Razak, 2018), cluster analysis is a bottom-up approach; it is merely a description of attributes related to one another with no fit indices, and the number of clusters is subjective (Hagenaars & McCutcheon, 2009). There is a more advanced algorithm called latent profile analysis that is more advantageous, however most researchers opt for cluster analysis because it is faster to compute. Latent profile analysis is a probabilistic model for clustering which lends itself to more theoretical speculation about the nature of the clustering. Latent Class Analysis uses patterns of association in people's behaviors to determine probabilities for

behaviors in the classes, so that inferences with maximum probability can be made to separate individuals into classes based on their behaviors or other features.

Present Study

This study moves beyond previous work by using a variant of Latent Class Analysis, Latent Profile Analysis (LPA), to identify and examine unique homogenous groups of young adults based on alcohol use, diet, and exercise behaviors based on the means of continuous observed variables. Using a large, nationally representative sample of young adults from the Behavioral Risk Factor Surveillance System (BRFSS), the purpose of the present study is to identify profiles of lifestyle behaviors in a sample of young adults. Additionally, this study examines these profiles by gender. The profiles likely vary by males and females since drinking patterns and dietary patterns differ for males and females. The principle research question becomes: What homogenous group profiles are identified when examining eating behaviors, exercise behaviors, and alcohol use/misuse in emerging adult males and females using latent profile analysis? The secondary aim is to ascertain how BMI, physical health, mental health, and general health differ between these observed profiles.

Method

Participants

The Behavioral Risk Factor Surveillance System (BRFSS) is an annual survey conducted by random-digit-dialed telephone (both cellular and landline) in all 50 United States, Washington D.C., and U.S. territories. The goal of the BRFSS is to collect information on health-related activities, behavioral risk factors, preventive health practices, substance use, and other chronic conditions among noninstitutionalized adults over the age of 18. The full 2017 dataset includes 450,648 records. The number of responses were limited to males and females between the ages

of 18 and 25, and then further restricted for computation efficiency. Respondents in the final reduced sample with complete data on study variables (N=17,286) were separated by gender for latent profile analysis, resulting in a sample of 9,237 males and a sample of 8,049 females. Males, comprising 53.4% of the entire sample, had a mean age of 23.22 years (SD = 3.16). Males' race/ethnicity distribution was 66.9% White, 7.1% Black, 5.1% Asian, 2.1% Native American/Alaskan, 13.9% Hispanic, and 5.0% other. Females, comprising the other 46.6% of the study, had a mean age of 23.38 years (SD = 3.16). Females' race/ethnicity distribution was 63.3% White, 8.2% Black, 5.7% Asian, 2.0% Native American/Alaskan, 15.7% Hispanic, and 5.1% other.

Measures

Demographics. Participants were asked a variety of demographic questions. *Income* was measured by the question of "What is your annual household income from all sources?" Responses were coded into eight categories, where "1" was less than $10,000, "2" $10,000 to $15,000, "3" $15,000 to $20,000, "4" $20,000 to $25,000, "5" $25,000 to $35,000, "6" $35,000 to $50,000, "7" $50,000 to $75,000, and "8" of more than $75,000. Participants reported their age ("How old are you?") with participants older than 80 being collapsed into an "80+" category (less than .5%). Participants identified their *gender* as male or female. Participants reported their *race/ethnicity*, with options of "1" White, "2" Black, "3" Asian, "4" American Indian/Alaskan Native, "5" Hispanic," or "6" other race/ethnicity.

Food Consumption. Healthy food consumption was assessed with two items. *Fruit intake* was assessed by the question of "Now think about the foods you ate or drank during the past month that is, the past 30 days, including meals and snacks. Not including juices, how often did you eat fruit? You can tell me times per day, times per week, or times per month." Answers

were coded in fruit per day. *Vegetable intake* was assessed by the question of "How often did you eat a green leafy or lettuce salad, with or without other vegetables? Answers were coded in vegetables per day. Healthy food consumption was a summed variable of fruit intake and vegetable intake. Unhealthy food consumption, or *French fries per day* was assessed by the question of "How often did you eat any kind of fried potatoes, including French fries, home fries, or hash browns?" While fried potatoes could be counted toward vegetable intake in nutrition research (Slavin & Lloyd, 2012), eating fried foods of any kind can bring health consequences, as eating fried food is associated with obesity (Guallar-Castillon et al., 2007). Fried potato consumption was chosen as the unhealthy eating indicator since this was the only available option for fried food in the BRFSS.

Exercise. Exercise was assessed with two items. Participants were asked "During the past month, other than your regular job, did you participate in any physical activities or exercises such as running calisthenics, golf, gardening, or walking for exercise?" If participants answered yes, they were asked "How many times per week or per month did you take part in this activity during the past month?" Answers were coded in times per week.

Alcohol. *Alcohol use* was measured by participants' responses to two questions. Participants were first asked "During the past 30 days, how many days per week or per month did you have at least one drink of any alcoholic beverage such as beer, wine, a malt beverage or liquor? Answers were coded in days per week. Participants who responded "Don't know/Not sure" or refused to answer were omitted from the study. Participants were then asked "One drink is equivalent to a 12-ounce beer, a 5-ounce glass of wine, or a drink with one shot of liquor. During the past 30 days, on the days when you drank, about how many drinks did you drink on

the average?" Drinking days per week and drinks per drinking day were multiplied to calculate *Drinks per week.*

Health. *Poor mental health* was indicated by "Now thinking about your mental health, which includes stress, depression, and problems with emotions, for how many days during the past 30 days was your mental health not good?" with responses of 0 to 30. *Poor physical health* was assessed by the question of "Now thinking about your physical health, which includes physical illness and injury, for how many days during the past 30 days was your physical health not good?" with responses of 0 to 30. *Poor General health* was indicated by "Would you say that in general your health is--"with responses of (1) Excellent, (2) Very Good, (3) Good, (4) Fair, or (5) Poor.

Data were analyzed using M-Plus multivariate software. Latent Class Analysis (LCA), Analysis of Variance (ANOVA), and Tukey's Post Hoc test were utilized to examine the data. LCA is useful for analyzing relationships within categorical and continuous data. The identification of latent classes are not directly observed, rather they are inferred from multiple observed indicators within the data (Finch & Bronk, 2011). This analysis provides a valuable framework for describing population heterogeneity in terms of differences across individuals on a set of behaviors or characteristics, instead of defining the variability in the data by a single variable (Henry & Muthen, 2010). The BIC is a statistic developed to aid model selection by penalizing the number of factors in a model; the lower this number, the better fit compared to the other class options (Schreiber, 2016). Entropy is a statistic designed to measure how accurately respondents can be assigned to classes, with a score of 1 being 100% certainty about class allocation (Celeux & Soromenho, 1996; Schreiber, 2016). Latent class scores were converted to Z-scores for graphic representation of the variables utilized to define the latent classes for males

and Females (Figure 1). ANOVA was used to calculate if there were significant differences in the health indicators between latent classes, and Tukey's Post Hoc test was used to ascertain between what specific classes those differences occurred.

Results

The descriptive statistics (n = 17,376), for male participants (n = 9,327), and for female participants (n = 8,049) is displayed in Table 1. The full sample with males and females combined consumed an average of 3.39 standard alcoholic drinks per week (SD = 6.71), exercised an average of 3.12 times per week (SD = 2.58), ate an average of 1.55 fruits and vegetables per day (SD = 1.34), and consumed an average of 0.3 servings of fried potatoes per day (SD = 0.39). Males consumed an average of 4.35 standard alcoholic drinks per week (SD = 7.93), exercised 3.2 times per week (SD = 2.59), ate an average of 1.47 fruits or vegetables per day (SD = 1.34), and consumed fried potatoes an average of 0.33 times per day (SD = 0.43). Females consumed an average of 2.28 standard alcoholic drinks per week (SD = 4.7), exercised 3.02 times per week (SD = 2.56), ate an average of 1.64 fruits or vegetables per day (SD = 1.33), and consumed fried potatoes an average of 0.26 times per day (SD = 0.34).

For health, the full sample averaged 2.19 days (SD = 5.42) in the past month when physical health was not good and 4.98 days (SD = 8.19) when mental health was not good. For general health, with 1 indicating excellent and 5 indicating poor, the full sample had an average score of 2.24 (SD = 0.95). Average BMI for the full sample was 26.17 (SD = 5.98). Males averaged 1.87 days in the last month where physical health was not good (SD = 5.05) and 4.06 days where mental health was not good (SD = 7.57). For general health, with a score of 1 indicating excellent and 5 indicating poor, males averaged a score of 2.19 (SD = 0.94). Average BMI for males was 26.13 (SD = 5.55). Females averaged 2.56 days in the last month where

physical health was not good (*SD* = 5.81) and 6.05 days where mental health was not good (*SD* = 8.73). For general health, females averaged a score of 2.29 (*SD* = 0.95). Average BMI for females was 26.22 (*SD* = 6.45).

Comparing the male and female samples, males drank more alcohol per week, $t(17,374) = 21.31$, $p < .001$ (Table 2). Males exercised more per week, $t(17,374) = 4.48$, $p < .001$. Females ate more fruits and vegetables per day, $t(17,374) = -8.07$, $p < .001$. Males ate more fried potatoes per day, $t(17,374) = 11.73$, $p < .001$. Comparing the health indicators between males and females, females reported more days than males where physical health was not good, $t(17,374) = -8.23$, $p < .001$. Females also reported more days where mental health was not good, $t(17,374) = -15.89$, $p < .001$. Females reported significantly worse general health, $t(17,374) = -6.83$, $p < .001$. Males and females were significantly different on these key variables, thus it was decided to run analyses separately for males and females.

Aim 1: Latent Profile Analysis

Fit Indices. After examining the Akaike Information Criteria (AIC), Bayesian Information Criteria (BIC), entropy, class size proportions, and what makes most theoretical and conceptual sense, a five class model was deemed the best overall fit. The information utilized to determine that a five class option was the best suited for these data for both males and females is displayed in Table 1. Despite a 6 class option having a better BIC value and the same entropy value, the distribution between classes for a 5 class model for males, who only had a minimum group of 1.9% of the sample, was found to be better fitting and more viable for subsequent analyses than a 6 class model where the smallest group contained only 0.3% of the sample. The class that contained only 0.3% of the sample did not provide enough participants within that class to complete follow up analyses. Similarly, females also had a poor distribution of

participants per class in a six class model with only 0.2% represented in the smallest class, thus urging the choice of the five class model over the six class since the data were more evenly distributed and viable for subsequent analyses. These five classes for both males and females were named Moderates, Unhealthy Eaters, Medium Drinkers, Healthier Eaters and Exercisers, and Heavy Drinkers. The names were chosen based on the defining characteristics of each group.

Table 1. *Latent Class Fit Indices*

Males					
	AIC	**BIC**	**Entropy**	**Largest Class %**	**Smallest Class %**
2 Classes	146088	146181	0.99	0.983	0.016
3 Classes	140748	140877	0.98	0.933	0.015
4 Classes	137665	137829	0.98	0.866	0.015
5 Classes	135839	136039	0.96	0.819	0.019
6 Classes	134220	134456	0.96	0.819	0.003
Females					
	AIC	**BIC**	**Entropy**	**Largest Class %**	**Smallest Class %**
2 Classes	114544	114635	0.99	0.98	0.019
3 Classes	110619	110745	0.99	0.974	0.009
4 Classes	107903	108064	0.98	0.921	0.007
5 Classes	106385	106581	0.95	0.855	0.007
6 Classes	104849	105079	0.95	0.834	0.002

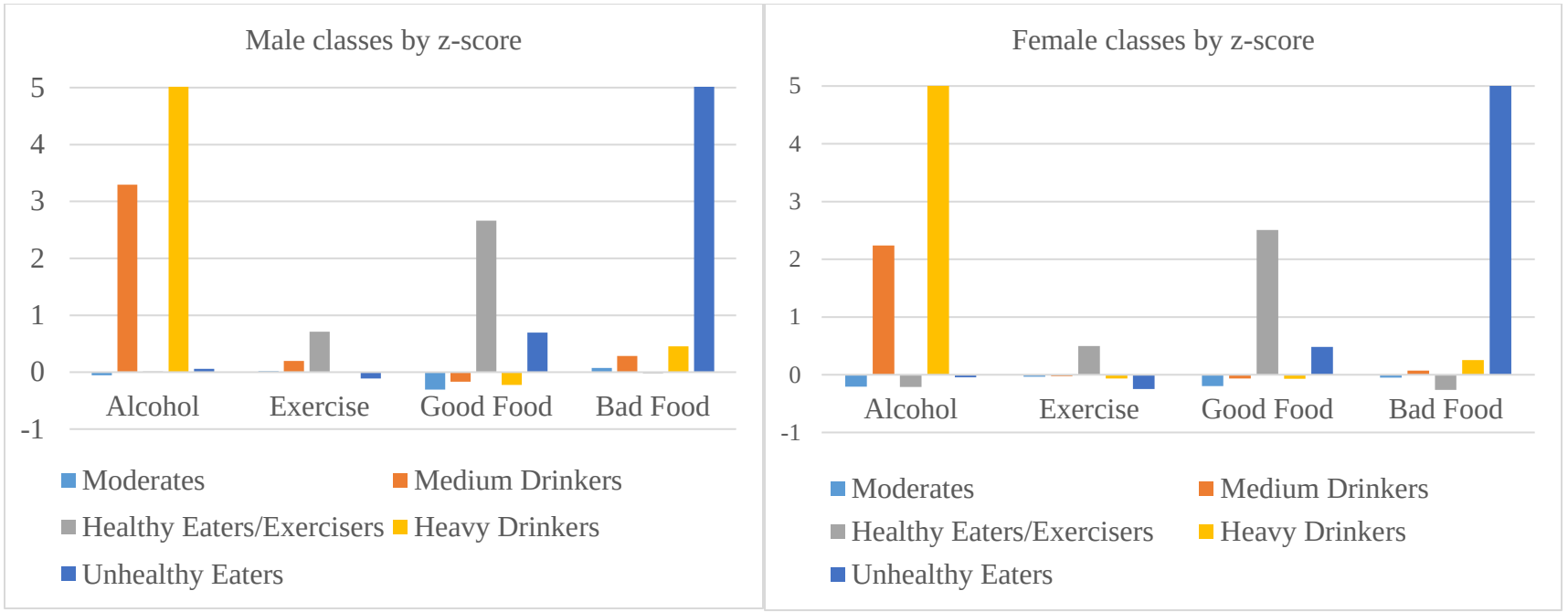

Figure 1. Defining variables for male latent classes on the left and females latent classes on the right.

Male Latent Classes

The five distinct profiles for males are Moderates, Unhealthy Eaters, Medium Drinkers, Healthy Eaters and Exercisers, and Heavy Drinkers (Table 3 top).

Moderates. Class 1, the Moderates, was the largest class for males, consisting of 7,646 individuals, 82% of the male sample. This profile was characterized by with overall unremarkable behavioral patterns, including slightly below average drinking (M = 2.03 standard drinks per week; SD = 2.82; z = -0.053), average exercise (M = 3.07 exercise sessions per week; SD = 2.55; z = 0.019), slightly below average on fruit and vegetable consumption (M = 1.23 fruits or vegetables per day; SD = 0.90; z = -0.305), and about average for fried potato consumption (M = 0.29 servings per day; SD = 0.25; z = 0.075).

Unhealthy Eaters. Class 2, the Unhealthy Eaters, consisted of 144 individuals, 1.54% of the male sample. This profile was characterized by slightly above average drinking (M = 2.56; SD = 4.45; z = 0.06), slightly below average exercise (M = 2.73; SD = 2.59 ; z = -0.11), slightly above average fruit and vegetable consumption (M = 2.57; SD = 2.49; z = 0.70), and most prominently, extremely above average fried potato consumption (M = 2.80; SD = 1.07; z = 7.47).

Medium Drinkers. Class 3, the Medium Drinkers, consisted of 890 individuals, 9.54% of the male sample. This profile was characterized by above average drinking (M = 17.76; SD = 5.07; z = 3.29), slightly above average exercise (M = 3.52; SD = 2.63; z = 0.20), slightly below average fruit and vegetable consumption (M = 1.41; SD = 1.18; z = -0.17), and slightly above average fried potato consumption (M = 0.36; SD = 0.29; z = 0.29).

Healthier Eaters and Exercisers. Class 4, the Healthier Eaters and Exercisers, consisted of 467 individuals, 5% of the male sample. This profile was characterized by average drinking (M = 2.33; SD = 3.54; z = 0.01), above average exercise (M = 4.84; SD = 2.65; z =

0.71), above average fruit and vegetable consumption (*M* = 5.18, *SD* = 1.52; *z* = 2.66), and slightly below average fried potato consumption (*M* = 0.25; *SD* = 0.29; *z* = -0.02).

Heavy Drinkers. Class 5, the Heavy Drinkers, consisted of 180 individuals, 1.93% of the male sample. This profile was characterized by extremely above average drinking (*M* = 43.30; *SD* = 9.99; *z* = 8.73), average exercise (*M* = 3.04; *SD* = 2.61; *z* = 0.00), slightly below average fruit and vegetable consumption (*M* = 1.34; *SD* = 1.40; *z* = -0.22), and above average fried potato consumption (*M* = 0.41, *SD* = 0.35; *z* = 0.45).

Female Latent Classes.

The five distinct profiles for females are Moderates, Unhealthy Eaters, Medium Drinkers, Healthier Eaters and Exercisers, and Heavy Drinkers (Table 3 bottom).

Moderates. Class 1, the Moderates, consisted 6,888 individuals, 85.58% of the female sample. This profile was characterized by slightly below average drinking (*M* = 1.3; *SD* = 1.87; *z* = -0.21), slightly below average exercise (*M* = 2.93; *SD* = 2.54; *z* = -0.03), slightly below average fruit and vegetable consumption (*M* = 1.38; *SD* = 0.91; *z* = -0.20) and slightly below average fried potato consumption (*M* = 0.24; *SD* = 0.24; *z* = -0.05).

Unhealthy Eaters. Class 2, the Unhealthy Eaters, consisted of 74 individuals, 0.92% of the female sample. This profile was characterized by average drinking (*M* = 2.07; *SD* = 3.63; *z* = -0.04), below average exercise (*M* = 2.39; *SD* = 3.52; *z* = -0.25), slightly below average fruit and vegetable consumption (*M* = 2.28; *SD* = 2.51; *z* = 0.48), and much higher than average fried potato consumption (*M* = 2.64; *SD* = 1.00; *z* = 7.02).

Medium Drinkers. Class 3, the Medium Drinkers, consisted of 493 individuals, 6.12% of the female sample. This profile was characterized by above average drinking (*M* = 12.80; *SD* = 3.99; *z* = 2.24), slightly below average exercise (*M* = 2.96; *SD* = 2.11; *z* = -0.02), slightly

below average fruit and vegetable consumption (*M* = 1.56; *SD* = 1.13; *z* = -0.06), and slightly above average fried potato consumption (*M* = 0.28; *SD* = .025; *z* = 0.07).

Healthier Eaters and Exercisers. Class 4, the Healthier Eaters and Exercisers, consisted of 535 individuals, 6.65% of the female sample. This profile was characterized by below average drinking (*M* = 1.28; *SD* = 1.98; *z* = -0.21), above average exercise (*M* = 4.29; *SD* = 2.70; *z* = 0.50), well above average fruit and vegetable consumption (*M* = 4.97, *SD* = 1.38; *z* = 2.51), and below average fried potato consumption (*M* = 0.17; *SD* = 0.21; *z* = -0.26).

Heavy Drinkers. Class 5, the Heavy Drinkers, consisted of 59 individuals, just 0.73% of the female sample. This profile was characterized by extremely above average drinking (*M* = 37.21; *SD* = 12.25; *z* = 7.43), slightly below average exercise (*M* = 2.85; *SD* = 2.51; *z* = -0.07), slightly below average fruit and vegetable consumption (*M* = 1.55; *SD* = 1.50; *z* = -0.07), and above average fried potato consumption (*M* = 0.35; *SD* = 0.43; *z* = 0.25).

Aim 2: Latent Classes Predicting Health and BMI

Male Health Indicators. For drinks per week, there were significant differences between the latent classes, $F(4, 9322) = 10065.96$, $p < .001$. Tukey post hoc analyses were utilized to examine differences between groups. Heavy Drinkers (*M* = 43.30) reported higher rates of drinks per week than all four other classes, while Medium Drinkers (*M* = 2.02) reported more drinks per week than classes 1, 2, and 4 (Table 3). Similarly, significant differences were found across classes for exercise per week $F(4, 9322) = 57.66$, $p < .001$. The follow up analyses showed the Healthier Eaters and Exercisers (*M* = 4.84) exercised more per week than all other classes. Medium Drinkers (*M* = 3.52) also exercised more per week than Moderates (*M* = 3.07), and Unhealthy Eaters (*M* = 2.73). Fruits/Vegetables per day was also found to have significant differences across groups $F(4, 9322) = 1689.73$, $p < .001$. It was found that only the Healthier

Eaters and Exercisers class (M = 5.18) was significantly different from all other classes, having a higher average consumption of fruits and vegetables per day. French fries per day was also seen to have significant differences across classes $F(4, 9322) = 2656.96$, $p < .001$. Post hoc analyses revealed Unhealthy Eaters (M = 2.80) to have higher consumption of French fries per day than all other classes. Heavy Drinkers also had a higher consumption of French fries (M = .41) than Moderates (M = .33) and Healthier Eaters and Exercisers (M = .25).

While the number of poor physical health days reported by males had significant differences across classes $F(4, 9322) = 5.20$, $p = .003$, post hoc analyses could not determine which groups were different from one another. In terms of days of poor mental health, significant differences were seen overall between classes $F(4, 9322) = 2.37$, $p < .001$. Post hoc analyses revealed the number of reported days with poor mental health was higher in Medium Drinkers (M= 5.46) than Moderates (M = 3.90) and Healthy Eaters/Exercisers (M = 3.27). Similarly, Heavy Drinkers (M = 5.73) also reported more days with poor mental health than Moderates and Healthy Eaters/Exercisers. When it came to the participants' general health, there were significant differences overall across classes $F(4, 9322) = 16.96$, $p < .001$. Follow up analyses displayed general health for Moderates (M = 2.20), Unhealthy Eaters (M = 2.18), Medium Drinkers (M =2.21) and Heavy Drinkers (M = 2.39) to be worse than Healthy Eaters/Exercises (M = 1.86), however there were no differences found between any other groups. In terms of BMI, no differences were seen among the classes $F(4, 9322) = 0.74$, $p = .567$. All average BMIs for each group were nearly identical to the full sample (Table 3). Finally, differences in age were compared across groups and significant overall differences were found $F(4, 9322) = 12.68$, $p < .001$. Tukey post hoc analyses revealed that Medium Drinkers (M =

23.89) were older on average than Moderates (M = 23.15) and Healthy Eaters/Exercisers (M = 22.87). No other significant group age differences were recorded (Table 3).

Female Health Indicators. For drinks per week, there were significant differences between the latent classes, $F(4, 8044) = 6136.95$, $p < .001$. Tukey post hoc analyses were utilized to examine differences between groups. Heavy Drinkers (M = 37.21) drank more per week than all four other classes, while Medium Drinkers (M = 12.80) drank more per week than classes 1, 2, and 4 (Table 3). Similarly, significant differences were found across classes for exercise per week, $F(4, 8044) = 37.04$, $p < .001$. The follow up analyses showed that Healthier Eaters and Exercisers (M = 4.29) exercised more times per week than all other classes. For fruit and vegetable consumption, there was also a significant difference found across classes, $F(4, 8044) = 1645.64$, $p < .001$. The follow up analyses showed the Healthier Eaters and Exercisers (M = 4.97) ate more fruits and vegetables per day than all other classes. French fries per day was also seen to have significant differences across classes, $F(4, 8044) = 1645.4$, $p < .001$. Post hoc analyses revealed Unhealthy Eaters (M = 2.65) ate more fried potatoes per day than all other classes.

There were significant differences found between latent classes in the number of days physical health was not good in the past month, $F(4, 8044) = 4.87$, $p < .001$. Follow up analyses showed the Heavy Drinkers (M = 5.81) reported more days where physical health was not good than did groups 1, 3, and 4, while Unhealthy Eaters (M = 4.3) reported more days where physical health was not good than did the Healthier Eaters and Exercisers (M = 2.04). Similarly, there were also significant differences found between classes in the number of days mental health was not good in the past month, $F(4, 8044) = 6.15$, $p < .001$. Follow up analyses showed the Medium Drinkers (M = 7.56) reported more days in the past month where mental health was not good

than did Moderates (M = 5.95) and Healthier Eaters and Exercisers (M = 5.44). Additionally, Heavy Drinkers (M = 9.71) reported more days where mental health was not good than did Moderates and Healthier Eaters and Exercisers. There were also significant differences found between latent classes in general health, $F(4, 8044) = 12.14$, $p < .001$. Follow up analyses showed that Unhealthy Eaters (M = 2.62) and Heavy Drinkers (M = 2.69) both reported worse general health than did classes 1, 3, 4 (Table 3). For Body Mass Index, there was a significant difference found between latent classes, $F(4, 8044) = 2.57$, $p < .05$, however, follow up tests did not find any specific differences between groups. Finally, there was a difference found between average age of the latent classes, $F(4, 8044) = 3.57$, $p < .01$. Post hoc analyses found Medium Drinkers (M = 23.86) to be older on average than Unhealthy Eaters (M = 22.91).

Table 2. *Sample Descriptive Statistics and t-tests Between Genders*

	Full Sample			Male			Female				
	M	*SD*	%	*M*	*SD*	%	*M*	*SD*	%	*t* statistic	*p*- value
Demographics											
Age	23.29	3.16		23.22	3.16		23.38	3.16		-3.467	**.001**
Race/Ethnicity											
White			65.0%			66.9%			62.7%		
Black			8.5%			7.1%			10.2%		
Asian			4.7%			5.1%			4.3%		
Native American/Alaskan			2.1%			2.1%			2.1%		
Hispanic			14.7%			13.9%			15.7%		
Other			5.0%			5.0%			5.0%		
Latent Class Predictors											
Drinks per week	3.39	6.71		4.35	7.93		2.28	4.70		21.307	**<.001**
Exercise per week	3.12	2.58		3.20	2.59		3.02	2.56		4.476	**<.001**
Fruits/Vegetables per day	1.55	1.34		1.47	1.34		1.64	1.33		-8.066	**<.001**
French Fries per day	.30	.39		0.33	0.43		0.26	0.34		11.734	**<.001**
Health Indicators											
Days physical health not good	2.19	5.42		1.87	5.05		2.56	5.81		-8.232	**<.001**
Days mental health not good	4.98	8.19		4.06	7.57		6.05	8.73		-15.890	**<.001**
General health not good	2.24	.95		2.19	0.94		2.29	0.95		-6.834	**<.001**
BMI	26.17	5.98		26.13	5.55		26.22	6.45		-1.040	.293

Note: *n* =17,376 for full sample 9,327 for males, 8,049 for females

Table 3. *Male and Female Latent Class Predictors by Class*.

	Males Latent Classes								
	Moderates *n* = 7,646			Unhealthy Eaters *n* = 1,144			Medium Drinkers *n* = 890		
	M	*SD*	*z*	*M*	*SD*	*z*	*M*	*SD*	*z*
Latent Class Predictors									
Drinks per week	2.03	2.82	-0.05	2.56	4.45	0.06	17.76	5.07	3.29
Exercise per week	3.07	2.55	0.20	2.73	2.59	-0.11	3.52	2.63	0.20
Fruits/Vegetables per day	1.23	0.90	-0.31	2.57	2.49	0.69	1.41	1.18	-0.17
French Fries per day	0.29	0.25	0.07	2.80	1.07	7.47	0.36	0.29	0.29
	Females Latent Classes								
	Moderates *n* = 6,888			Unhealthy Eaters *n* = 74			Medium Drinkers *n* = 493		
	M	*SD*	*z*	*M*	*SD*	*z*	*M*	*SD*	*z*
Latent Class Predictors									
Drinks per week	1.30	1.87	-.21	2.07	3.63	-.04	12.80	3.99	2.24
Exercise per week	2.93	2.54	-.03	2.39	3.52	-.25	2.96	2.11	-.02
Fruits/Vegetables per day	1.38	.91	-.20	2.28	2.51	.48	1.56	1.13	-.06
French Fries per day	.24	.24	-.05	2.65	1.00	7.02	.28	.25	.07

Note: 1= Moderates, 2= Unhealthy Eaters, 3= Medium Drinkers, 4=Healthy, 5= Heavy Drinkers.

Table 3. *Continued*

	Male Latent Classes							
	Healthy *n* = 467			Heavy Drinkers *n* =180			p-value for F test	Sig. group differences
	M	*SD*	*z*	*M*	*SD*	*z*		
Latent Class Predictors								
Drinks per week	2.33	3.54	0.01	43.30	9.99	8.73	**.001**	5 > 1,2,3,4; 3 > 1,2,4
Exercise per week	4.84	2.65	0.71	3.04	2.61	0.01	**.001**	4 > 1,2,3,5; 3 > 1,2
Fruits/Vegetables per day	5.18	1.52	2.67	1.34	1.40	-0.22	**.001**	4 > 1,2,3,5
French Fries per day	0.25	0.29	-0.02	0.41	0.35	0.45	**.001**	2 > 1,3,4,5; 5 > 1,4
	Female Latent Classes							
	Healthy *n* = 535			Heavy Drinkers *n* = 59			p-value for F test	Sig. group differences
	M	*SD*	*z*	*M*	*SD*	*z*		
Latent Class Predictors								
Drinks per week	1.28	1.98	-.21	37.21	12.25	7.43	**.001**	5 > 1,2,3,4; 3> 1,2,4
Exercise per week	4.29	2.70	.50	2.85	2.51	-0.07	**.001**	4 > 1,2,3,5
Fruits/Vegetables per day	4.97	1.38	2.51	1.55	1.50	-0.07	**.001**	4 > 1,2,3,5
French Fries per day	.17	.21	-.26	.35	.43	0.25	**.001**	2 > 1,3,4,5

Note: 1= Moderates, 2= Unhealthy Eaters, 3= Medium Drinkers, 4=Healthy (Healthier Eaters and Exercisers), 5= Heavy Drinkers

Discussion

Broadly, the present study examined lifestyle profiles of young adults. Specifically, comparing the male and female total samples descriptively, males averaged more alcohol consumption, more exercise, and more fried potato consumption than females, while females averaged more fruits and vegetables per day than males. Females also averaged more days in the past month where physical health was not good and when mental health was not good, and averaged worse reported general health. The primary aim of this study was to use dietary information, exercise behavior, and alcohol consumption to develop distinct homogenous profiles using latent class analysis. Overall, five distinct profiles for both males and females were identified: Moderates, Unhealthy Eaters, Medium Drinkers, Healthier Eaters and Exercisers, and Heavy Drinkers. While these latent class profiles were far from even in size, the proportions were parallel between males and females. The largest group for both males and females was the Moderates, which comprised 82% of the males and 86% of the females. Moderates were right at the mean for all behaviors, indicating that a large portion of young adults are eating at least some fruits and vegetables and partaking in some exercise as well as limiting alcohol intake. Although the majority of males and females in the sample were classified in the Moderate group with unremarkable behavioral patterns, others were classified into profiles that have cause for concern, and very few were classified into the healthiest profile.

Those who showed the healthiest overall behaviors, the Healthier Eaters and Exercisers, comprised 5% of the males and 7% of the females. The small size of the healthy groups for both males and females reinforces the literature that suggests young adults typically make unhealthy diet choices and have some of the lowest fruit and vegetable intake of any age, with young adult males being at the greatest risk of insufficiency (Abraham, Noriega, & Shin, 2018; CDC, 2018).

Future work may want to identify what motivates individuals who fall into this group, as it could be an intervention point with the higher risk group. This means that the motivations for the healthy group could be a point of resiliency that can be used for health promotion as well as interventions to encourage healthy dietary and exercise behaviors for the other groups.

Medium Drinkers comprised 6% of females and 10% of males, and do not necessarily raise health concerns based on alcohol consumption, however Medium Drinkers could be at a greater risk for experiencing alcohol-related health problems than the three groups that drink less. The Medium Drinkers being slightly larger for males than females is consistent with previous research that suggests males typically drink more than females (Barry et al., 2013). Overall this group seems to consist of those who drink fairly often, yet somewhat responsibly. However, it is important to note that Medium Drinkers did report more days when mental health was not good compared to Healthier Eaters and Exercisers. There are two possibilities for this association. First, individuals in this group may be drinking to cope or cover poor mental health. Second, mental health may be poor due to the alcohol use. Alcohol is a depressant and the effects of drinking include depression, anxiety, and irritability. Thus, future research is warranted and should consider examining links between alcohol consumption, exercise, lack of fruit and vegetable intake, and mental health outcomes within Medium Drinkers.

The Heavy Drinkers and Unhealthy Eaters were the two smallest latent classes for both males and females; participants in these groups present the greatest health concerns. Unhealthy Eaters comprised 2% of males and 1% of females, and Heavy Drinkers comprised 2% of males and 1% of females. This shows that while the unhealthiest of behaviors belong to very few males and females, approximately twice as many males than females are at risk for falling into Unhealthy Eating or Heavy Drinking groups. However, these two groups are at the highest

health risk based on their profiles. Heavy drinking is associated with poor diets, unhealthy weight control, body dissatisfaction, sedentary behavior, liver damage, and kidney dysfunction (Nelson, Lust, Story, & Ehlenger, 2009). Unhealthy eating patterns are associated with obesity, heart disease, type 2 diabetes, cancer, hypertension, and stroke (Llerena et al., 2015; Gorski & Roberto, 2015). Without proper intervention, these behaviors will likely carry forward and compound the detriments to overall health, as emerging adulthood is an important period for the development of lifelong health behaviors (Riggs-Romaine, 2018). Therefore, focus should be placed on the Heavy Drinkers and Unhealthy Eaters for future intervention or prevention studies.

While not tested for significance in the latent classes, it is important to note the various distinctions found between males and females on some of these variables. For instance, heavy drinking females reported worse general health and more days when their physical and mental health were not good relative to most other profiles. For males, this distinction was not as consistent. Specifically, heavy drinking males were really only different from the healthy profile, and most of the profiles were different from that healthy profile. This distinction is interesting and might be reflective of the lower rates of binge drinking among females; heavy drinking is more of an atypical behavior for females and more normative for males. The mechanism leading to the atypical behavior for females is also likely intermingled with the physical and mental health outcomes, as female heavy drinkers may experience more health consequences than their heavy drinking male peers. Gender differences in body structure and chemistry cause females to absorb more alcohol and take longer to metabolize it (CDC, 2018).

For males, there were no significant differences between groups for physical health. However, Heavy Drinkers and Medium Drinkers both reported significantly more days when mental health was not good than the Healthier Eaters and Exercisers and the Moderates. These

might be reflective of eating or drinking to cope or an outcome of unhealthy eating and drinking. Future work will want to parcel out the direction of those effects. Overall, the Unhealthy Eaters and Heavy Drinkers reported more days when their mental, physical, and general health are not good compared to the healthiest individuals. This is unsurprising given the stark differentials in unhealthy food and alcohol intake. These unhealthy behaviors are showing clear signs of deteriorating health in all facets. Fortunately it is not too late to reverse or at least diminish these health consequences with proper education and intervention.

Interestingly, BMI was not significantly different across latent class profiles for males, and while it was for females, follow up analyses showed no significant differences between groups. It should be disclaimed that body mass index is not purely indicative of health. BMI is widely used as a risk factor for the prevalence or development of several health issues and is widely used in determining public health policies. However, it is actually a rather poor indicator of body fat percentage (Nuttall, 2015). BMI could be helpful at higher levels in informing clinical judgement, but additional criteria are needed for measuring body fatness at BMI levels near normal (Biblioni, Pons, & Tur, 2013). Moreover, the values used to calculate BMI were the self-reported heights and weights of participants. This methodology has been proven to be potentially inaccurate. Adults tend to under-report their own weight, and the gap between actual weight and reported weight increases with obesity (Olfert et al., 2018). This phenomenon could have skewed some body mass indexes to appear healthier than reality. Additionally, young adult males overestimate height more than young adult females (Olfert et al., 2018). This could partially explain the average BMI for males being slightly lower than the average BMI for females. Future studies would benefit from accurate anthropometrics and adding estimates of both adiposity and fat distribution (Biblioni, Pons, & Tur, 2013). It is important to consider that

these participants are all young and still in the process of establishing identities and exploring various behaviors (Jack, 1989). It would be beneficial to track these latent classes of young adults longitudinally in order to track the impact of their health behaviors on BMI over time.

Limitations and Future Research Directions

In addition to the aforementioned limitations with BMI, the variables used to assess dietary behaviors were insufficient in a few ways. The entire construct of unhealthful eating behaviors was limited to self-report fried potato consumption; this behavior is not the only indicator of unhealthy eating and does not fully resemble how many ways in which young adults can have unhealthful diets. Healthy eating was limited similarly in not capturing the entirety of fruit and vegetable intake. Fruit consumption excluded juices and vegetable consumption was limited to the context of a leafy green salad and any potential vegetables added to the salad. Future research should include various other indicators of unhealthy eating while addressing eating behavioral patterns such as late night eating, snacking between meals, or fasting, and how these behaviors are related to alcohol use. In addition to assessing if fruit and vegetable intake recommendations are met, future research should assess if participants meet and not exceed daily macronutrient levels of fats, carbohydrates, and protein to see if they obtained an appropriate amount of energy from their diets.

Conclusions

The phenomenon of "Drunkorexia" was not observed in these profiles, however the results and design of this study should still spark interest in other researchers to continue this topic of study. To further knowledge about behaviors of weight-conscious drinking young adults, a specific and rare type of drinker, the field would benefit from a study using qualitative methodology. Obtaining rich thick descriptions of these behaviors from emerging adults who

have experienced them will aid in further understanding health risk behaviors as well as the development of pro-health behaviors in young adulthood. Examining various motivations for these behaviors on an individual level while investigating personal lived experience and considering family, peer, and resource factors will be largely beneficial. A grounded theory approach would ideally help develop a unified theoretical explanation of how weight-conscious, alcohol consuming young adults are experiencing the phenomena of caloric restriction and/or compensatory dieting and exercise after heavy drinking episodes.

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