

5-2018

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A Study into the Relationship between Nutrition and Income in a College Setting

by

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An Honors Thesis in partial fulfillment of the requirements for the degree Bachelor of Science in  
Business Administration in Economics

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Fayetteville, Arkansas  
May 11, 2018

## **Abstract**

Many health related issues in the United States are linked to Americans' poor diet choices. College students, a subset of that population, establish important trends in their diet habits that they will maintain over their four years in college and beyond. Although previous literature has found income to be a determinant of diet, this paper does not find income to be a significant predictor of student nutrition. One potential explanation is that college provides a unique environment and circumstance. Yet, additional income suggests it could be important for students who suffer from a lack of funds—increasing their income brings about relatively healthier choices compared to students who do not suffer from a lack of funds. However, obtaining additional income via allowance emerges as an unfavorable circumstance—students receiving an allowance significantly, negatively predict nutrition. Finally, I find gender and senior status to be the remaining significant predictors of nutrition. These results, overall, contribute to the discussion regarding nutrition in a population experiencing an important, habit-forming stage in life.

## **Introduction**

Popular dialogue regarding nutrition has become saturated with dire statistics about the poor dietary habits Americans practice in their daily lives. Such alarming statistics include the fact that more than 2 in 3 adults are categorized as overweight and more than 1 in 3 adults are categorized as obese, up from 15% in the 1970s. Furthermore, the trends are troubling. Projections indicate this number will continue to rise, reaching 1 in 2 adults by 2030 (cdc.gov, 2018). The implications of this reality are serious and costly.

In 2008, obesity cost an estimated \$147 billion in the United States (cdc.gov, 2018). These dollars addressed the various health consequences of obesity including heart disease, stroke, and type 2 diabetes. These, and other repercussions, are enabled by routine consumption of food products containing low nutritional value. Research findings from the Federation of American Societies for Experimental Biology (FASEB) in 2015 reveal 60% of calories in the food Americans purchase come from processed products. The movement away from whole foods and toward processed foods compromises nutrient rich benefits, fiber, and protein, which help

maintain a healthy lifestyle while increasing fat, sugar, and salt intake. Yet, optimal consumption of whole foods can be complicated by many variables with price likely playing the largest role.

Because price offers individuals incentives to consume items of low-nutritional value, developing positive decision-making habits is essential to maintaining an individual's health. Rapidly increasing health related issues due to poor nutrition raises the stakes to understanding what motivates consumer decisions in various contexts. This paper explores nutrition in one such context—a 4-year college with a large student population.

College challenges students, typically aged 18-22, to adapt to a new environment and circumstances. These four years offer new financial freedom for most students but also requires responsibilities—such as grocery purchasing—that may be unfamiliar. In this context, I will focus on understanding the nutritional circumstances of students, who are often first time grocery buyers, relative to demographics. Keeping in mind that the typical student is enrolled four years, I will also explore if the progression of time refines habits and behavior.

For this paper, I have conducted a survey of 636 students at the University of Arkansas. I find, in aggregate, measures of nutrition trend positively by grade with seniors achieving the highest nutritional scores. This paper finds evidence to suggest some income *groups* may also significantly predict nutrition. Additionally, I find that students, on average, are not satisfied with their current diet—many unsatisfied students cite a lack of funds and lack of time to cook for themselves as reasons.

Although income and nutrition are generally found to be positively correlated by institutions such as the U.S. Food and Drug Administration (FDA), I find that these two variables do not have a significant relationship in this paper. However, *additional* income proved noteworthy in certain scenarios—students reportedly suffering from a lack of funds made more

healthy additional purchases relative to other students when provided additional income. Finally, analyzing nutrition as a function of gender emerged as a fascinating opportunity for further research—a clear disparity exists between males and females regarding the measure of nutrition used in this paper and self-assessed nutrition scores.

### **Lit Review**

The literature considering students' diets is expansive. Existing research shows that, on average, college students maintain poor eating habits, incorporating a disproportionate number of inflammatory items into their daily routine (Brevard and Ricketts, 1996). Perhaps one of the defining factors in students' poor diet choices is the significant transitional period that is college. Budget, food choice, and habit formation are all critical topics in exploring the determinants of college students' nutritional health and choices.

Numerous studies have found that, generally, there is a positive relationship between diet quality and income (Hazel et al. 2013). Various programs such as Supplemental Nutrition Assistance Program for Women, Infants, and Children (WIC) and Supplemental Nutrition Assistance Program (SNAP) exist in the United States to assist funding grocery bills for those falling in lower income categories. Data from November 2017 show that 8,662,725 and 43,196,899 Americans are enrolled in these programs respectively (fns.usda.gov, 2017). SNAP and WIC have proven effective, increasing fruit and vegetable consumption among participants and refining other grocery purchases to reflect a diet more similar than not to those of higher income families (Bartlett et al., 2014). However, not all households are eligible to receive financial support for their grocery consumption, including some college students.

Although low-income families may want to improve the nutritional value of their groceries, Dobson (1995) finds that little opportunity exists to “experiment” with healthier options. Consuming new, healthier foods not only costs more, it concerns parents that their children won’t take to new options. While seemingly trivial, response becomes a legitimate concern when zero waste is a priority for financially instable families. As a result, parents increasingly rely on cheap, highly processed, imitation foods containing little nutritional value. Low-income families aren’t alone in facing food insecurity.

College students, generally known to have lower budgets, are often faced with tough spending decisions (Kohanim et. al., 2013). In the case of the low-income student, pressure is often put on their variable expenses such as food consumption. Payne-Sturges (2018) finds that 15% of college students are food insecure with an additional 16% at risk for food insecurity. Furthermore, 80% of food insecure students reported the inability to eat balanced meals because they lacked the necessary funds. While many funding opportunities are available for higher education, the rising cost of attendance can be overwhelming for students making it difficult to develop a sustainable, effective budget (Ehrenberg, 2000).

The 2014-2015 average annual costs of attendance at universities for public and private institutions were \$18,632 and \$37,990 respectively (ed.gov, 2017). These figures have inflated tremendously in the past few decades (U.S. Department of Education, 2016). Scholarships, grants, parental support, student loans, and employment are some of the ways students can fund their education. “When asked who is responsible for covering the cost of tuition, 22% of students say that their parents pay; 18% of students pay it themselves; 16% say that a scholarship covers the cost; and 41% say that financial aid funds their tuition costs.” However, 4 out of 5 students end up working throughout college to pay for other expenses (Kohanim et al., 2013). The same

study found that the reality of college expenses is surprising for new students—61% of college freshmen admitted that college is more expensive than they anticipated (Kohanim et al., 2013).

A recent theory states that experience with the Great Recession has caused today's parents to expect their children to take on a larger financial role in their college experience (Descano, 2013). This would likely impact students their freshman year as many are budgeting and taking financial responsibility for their expenses for the first time. On the other hand, upperclassmen could be likely to experience an increasing propensity to spend, since those with post-graduation plans often anticipate higher incomes within the year. Although a student's financial situation could change considerably between their last year of college and their first year earning an income, old habits still die hard.

Childhood habits are often found to follow individuals into adulthood. In the case of nutrition, Ward, Long, Resch, and Giles (2017) found that early development of obesity significantly predicted obesity in adults. Unhealthy lifestyle habits not addressed between youth and adulthood determine an individual's ability to change their behavior, making college a critical time-period for habit breaking. Because "eating habits established in the first year or two likely carry forward into later college years," students self-funding their grocery expenditure are of particular interest to researchers (Driskell, 2005). Specifically, researchers may be interested in the effect that improved access to different foods has on initiating nutrition transitions.

Failing to break poor nutritional habits puts individuals at risk for some diseases, such as heart disease, diabetes, stroke, obesity, and hypertension (Hazel et al., 2013). Another potential side effect of poor diets, particularly relevant to this study, is depression—in 2013, 1/3 college students reported experiencing depression in the past year causing difficulty in functioning (apa.org, 2014). Payne-Sturges' study follows their food insecurity statistics to significantly

predict students suffering from depressive symptoms, low sleep, and lower self-rated health based on their nutritional wellbeing.

### **Hypothesis and Methodology:**

This paper considers three main factors influencing college students' nutrition: income, grade in college, and allowance. I have developed the following three hypotheses considering these factors.

**H1:** Income positively affects nutrition: Higher-income students consume a greater percentage of healthy foods than low-income students

**H2:** Grade in college affects nutrition: Upperclassmen consume a greater percentage of healthy foods than lowerclassmen

**H3:** Parental financial support affects nutrition: Students receiving an allowance will consume a greater percentage of healthy foods relative to students not receiving an allowance

The data for this paper were collected via online survey at the University of Arkansas in February and March of 2018. The survey was distributed to students in the Sam M. Walton College of Business via e-mail, all University of Arkansas students via Arkansas Newswire, and to my classmates. Students were incentivized to participate by being entered for a chance to win a \$50 Amazon gift card upon completion of the survey. Using an online survey to collect data for this paper allowed me to efficiently reach appropriately large sample sizes for aggregate analysis and statistical tests. Student participants faced 36 questions during this survey. At any point in



time, participants were allowed to exit the survey indefinitely or save their progress and resume answering questions a later time.

Questions regarding my independent variables record demographic data such as age, gender, ethnicity, grade, income, and allowance. Income was reported on a scale from \$0 to \$2000 per month. Allowance was reported without a maximum constraint. Questions regarding my dependent variables measure the nutritional behaviors and circumstances of the participant: students were asked to list the three items they spend the most amount of money on, about their diet perception, whether or not they always eat the type of diet they want, and, if not, what prevents them from eating the type of diet they want. Additionally, two scenarios were described to participants: one in which the student received an additional \$15 to spend at the grocery store and one in which the student had \$15 less to spend at the grocery store—students were asked to report a food item they would purchase and put back, respectively.

At the conclusion of the survey, students were asked to submit a recent grocery receipt and score the nutritional value of the items they had purchased on a scale from 1 to 10. Furthermore, I created a benchmark receipt for which students repeated an identical scoring process. Using both receipt scores, I create a standardized receipt score which allows me to compare scores across students while controlling for individual-specific differences in scoring.

$$\textit{Standardized Score} = \frac{\textit{Own Receipt Score}}{\textit{Benchmark Receipt Score}}$$

This process follows a similar study conducted by Payne-Sturges (2018) that analyzes self-perceived nutrition. Because food insecure students rated their nutrition lower than others in Payne-Sturges' study, I find this variable to be noteworthy in this investigation.

I refer to nutrition in this paper as the percentage of *healthy* grocery items that students consume—this value is the dependent variable for H1, H2, and H3. In order to calculate this percentage, using the American Heart Association’s (AHA) guidelines for a healthy diet, I categorize the three items that students spend the most money on at the grocery store into two categories: AHA approved healthy diet items and AHA unapproved healthy diet items. The AHA’s guidelines are similar, if not identical, to guidelines of other health organizations, such as the FDA. Items that are identified as healthy are considered in the following equation.

$$\% \text{ healthy items} = \frac{\text{AHA approved healthy diet items}}{\text{Total Items Consumed}}$$

Total items consumed typically equals a value of 3 unless the student participant reported less than 3 food items—in these cases, the denominator is calculated as the sum of AHA approved healthy diet items and AHA unapproved healthy diet items or, simply, total items consumed. I explore both the percentage of healthy items in an individual’s cart and the percentage of healthy items in aggregate groups.

I analyze whether my independent variables predict nutrition by means of standard linear regression analysis. For H1 and H2, I regress nutrition on income, grade, and gender. Considering three variables in these regression allows me to control for multiple factors. For income, I use income values and dummy variable income groups. For grade, I use number of years in school (1-4) and dummy variables by grade. For gender, I use dummy variables only.

Similarly, to test H3 I use a t-test in addition to a standard linear regression to analyze the relationship between allowance and income. The t-test indicates whether or not the nutrition of students receiving an allowance is statistically different than the nutrition of students not

receiving an allowance. Furthermore, a linear regression quantifies the effect each additional dollar of allowance has on nutrition.

A summary of my three hypotheses can be modeled in the equation below. This model predicts that income (H1), grade (H2), gender (control), and allowance (H3), will all significantly determine nutrition for student participants.

$$\% \text{ healthy items} = \beta_0 + \beta_1(\text{Income}) + \beta_2(\text{Grade}) + \beta_3(\text{Gender}) + \beta_4(\text{Allowance}) + \varepsilon_i$$

### **Data and Results:**

Of the student participants at the University of Arkansas (N=636), 219 students completed the survey, and 417 students partially completed the survey—a completion rate of 34.27%. Although many students exited the survey when asked to submit a grocery receipt, most responses contained sufficient data to consider them in the analysis of H1, H2, and H3. Of student participants, 33% are male while 67% are female. Table 1 displays the average number of years completed in school and average income of participants.

Table 1		
Ind. Variable	Mean	St. Dev.
Grade	3.08	0.20
Income	\$379.66	\$447.36

Table 2					
Dep. Variable	Overall Mean	Freshman	Sophomore	Junior	Senior
% healthy	63.05% (48.30%)	52.78% (50.06%)	58.74% (49.40%)	59.52% (49.23%)	77.06% (42.14%)
% healthy (additional item)	55.07% (49.80%)	41.01% (49.36%)	54.81% (50.01%)	64.71% (48.02%)	64.22% (48.16%)
Satisfaction	38.72% (48.76%)	31.82% (46.73%)	33.04% (47.25%)	36.36% (48.32%)	42.75% (49.66%)
# of observations	456	139	105	102	110

Table 3	
Independent Variable	Standardized Receipt Scores
Freshman	0.9411
Sophomore	1.0589
Junior	1.2243
Senior	1.4225
Female	1.1978
Male	1.1278
No Allowance	1.2357
Allowance	1.1100
Reported Lack of Funding	1.0775
Reported Sufficient Funding	1.2286

$$\% \text{ healthy items} = \beta_0 + \beta_1(\text{Income}) + \beta_2(\text{Grade}) + \beta_3(\text{Gender}) + \varepsilon_i$$

Table 4: Regression Analysis				
Independent Variables	H1		H2	Overall % healthy
	% healthy	% healthy	% healthy	
Intercept	35.58% *** (6.09%)	36.97% *** (6.14%)	43.23% *** (5.29%)	58.39%
Income	3.22% (4.85%)		4.04% (4.83%)	
Income < 250		0% (0%)		
Income 250-499		-5.27% (5.73%)		
Income 500-749		0.66% (6.88%)		
Income 750-999		17.65% ** (8.60%)		
Income 1000=<		1.03% (7.68%)		
Grade	5.44% *** (1.98%)	5.08% ** (2.00%)		
Grade Freshman			0% (0%)	
Grade Sophomore			4.05% (6.36%)	
Grade Junior			-0.56% (6.26%)	
Grade Senior			18.73% *** (6.09%)	
Female	11.59% ** (4.64%)	12.08% *** (4.63%)	11.26% *** (4.61%)	
* if P < 0.10    ** if P < 0.05    *** if P < 0.01				

**Hypothesis 1: Income positively affects nutrition: Higher-income students consume a greater percentage of healthy foods than low-income students**

Both regression listed in the H1 column of Table 4 test the prediction that income has a positive effect on student nutrition. While controlling for gender and grade, I regress nutrition on income in the first column of H1. The significance threshold for this and all ensuing regression is set at 0.05. Income does not result as a statistically significant predictor of nutrition in this regression ( $p=0.5057$ ). While controlling for gender and grade, in the second column of H1, I regress nutrition on 5 dummy variable income groups using “income<\$250” as the reference group. Students receiving an income between \$750 and \$999 result as the only income group that significantly predicts nutrition ( $p=0.0411$ ). However, this income group contains the smallest sample size ( $n=32$ ) of the 5 I consider which casts doubt on the results. Figure 1 illustrates aggregate consumption habits by income group. Although nutrition generally trends positively with income, sample size steadily decreases with higher income groups. Because inconsistent sample sizes can compromise the reliability of a model, it’s misleading to definitively conclude that the income group \$750-\$999 significantly predicts nutrition.

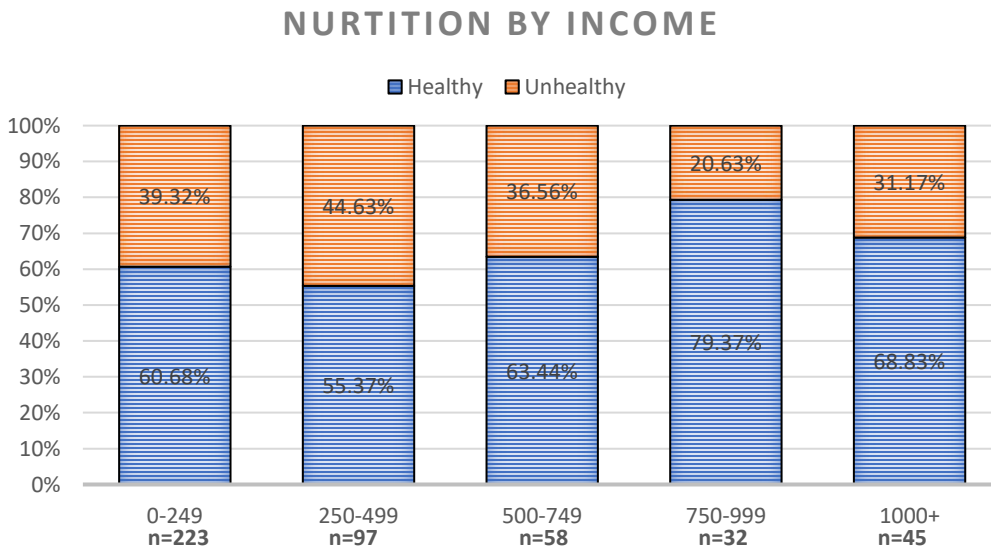


Figure 1

**Hypothesis 2: Grade in college affects nutrition: Upperclassmen consume a greater percentage of healthy foods than lowerclassmen**

Table 4 further provides regression analysis regarding H2 or how grade in school affects nutrition. In testing H1, grade in college preliminarily emerged as a statistically significant control in both regression predicting nutrition ( $p_1=0.0063$ ,  $p_2=0.0113$ ). When testing H1, grade was implemented into the regression by considering the number of years a student had completed in school (1-4). In order to further analyze this relationship, I regress nutrition on grade in school using dummy variables groups and “freshman” as my reference group while controlling for income and gender. The statistical significance of grade in the H1 regressions should be interpreted with caution once the H2 regression is considered. The only grade found to be statistically significant is senior ( $p=0.0023$ ). Additionally, the positive coefficient for grade in the H1 regressions appears to be primarily determined by a considerable senior coefficient. Figure 2 illustrates aggregate consumptions habits by grade in college.

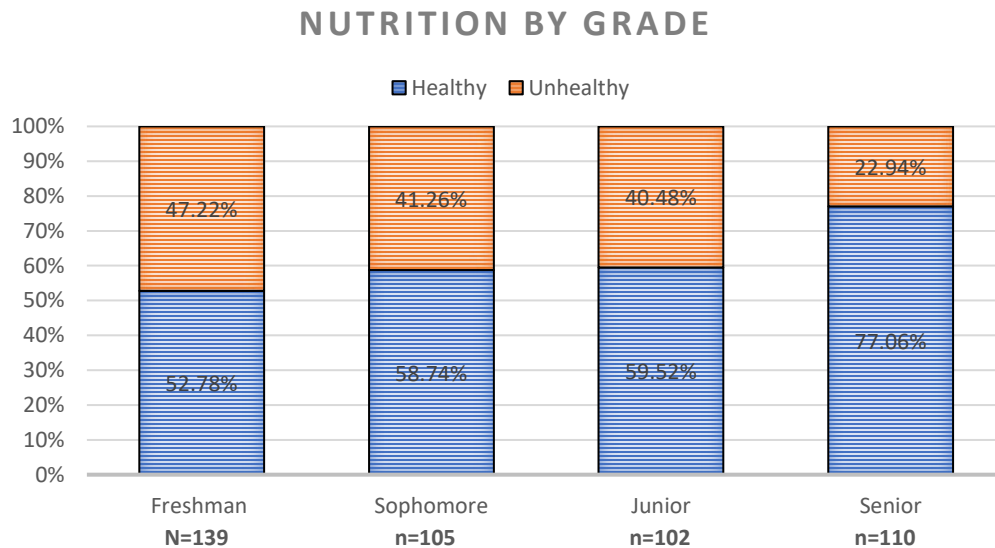


Figure 2

Senior status as a significant predictor of nutrition can be further explored in Table 2 and Table 3. In the scenario when student participants are provided additional income, 64.22% of

seniors reported they would select a healthy item as their addition—this percentage exceeds the same measure of their lowerclassmen counterparts. Additionally from Table 2, I find that senior diet satisfaction exceeds all other grades by at least 6.39%. Table 3 receipt scores trend positively by grade as well—this indicates that self-assessed nutrition has a positive relationship with grade in college. The significant results of the regression in Table 4 and information from Table 2 and Table 3 suggest that there is evidence to support H2.

**Hypothesis 3: Parental financial support affects nutrition: Students receiving an allowance will consume a greater percentage of healthy foods relative to students not receiving an allowance**

I use a t-test and standard linear regression to analyze H3. Because students either receive an allowance or do not receive an allowance, I use a t-test to determine whether or not the nutrition of these two circumstances are statistically different. The results of Table 5’s t-test are significant ( $p=0.0073$ ), which is consistent with H3’s prediction until referencing the mean percentages of the two groups. Students *not* receiving an allowance have a higher mean percentage of nutrition than students who are receiving an allowance. This indicates that receiving an allowance has a negative effect on student nutrition.

Table 5: % of Healthy Items by Allowance		
	<i>Allowance</i>	<i>No Allowance</i>
Mean	52.35%	64.27%
Variance	15.24%	14.20%
Stdev	(3.90%)	(3.77%)
Observations	149	153
t Stat	-2.6991	
P(T<=t) two-tail	0.0073***	
	* if P < 0.10	** if P < 0.05      *** if P < 0.01



I use a standard linear regression in order to further understand the negative relationship that is indicated between allowance and nutrition in the previous t-test. In Table 6, I regress nutrition on allowance amount. Students that do not receive an allowance are included in this regression with an allowance of \$0.

$$\% \text{ healthy items} = \beta_0 + \beta_1(\text{Allowance}) + \varepsilon_i$$

Table 6	
	% healthy
Intercept	61.61%*** (2.67%)
Allowance	-0.02%** (0.01%)
* if P < 0.10      ** if P < 0.05 *** if P < 0.01	

In addition to the t-test, the results from this particular regression are also statistically significant (p=0.0304). The coefficient for allowance indicates that each additional dollar of allowance decreases the average student's nutrition by -0.02%. Table 3's receipt score trend in similar directions. Perceived nutrition results are higher for students who do not receive an allowance relative to students who do receive an allowance. Using the t-test and linear regression, I find H3 to be partially supported: parental financial support does affect nutrition; however, this relationship is negative rather than positive.

**Other Notable Findings:**

Because H1 and H2 control for gender, I find in Table 4 that women are significant predictors of nutrition in every regression. These results lead me to further investigate the relationship between gender and nutrition. Figure 3 illustrates how the majority of both men and women are found to be unsatisfied with their diet; furthermore, women's dissatisfaction exceeds

that of men's by 12.39%. Yet, Figure 4 indicates women's nutrition exceeds that of men's by 8.25%. Additionally self-assessed receipt scores for women are higher than men's. This disparity between men and women's nutrition, diet satisfaction, and self-assessed receipt scores indicates that further analysis should be conducted into the role gender plays in determining nutrition.

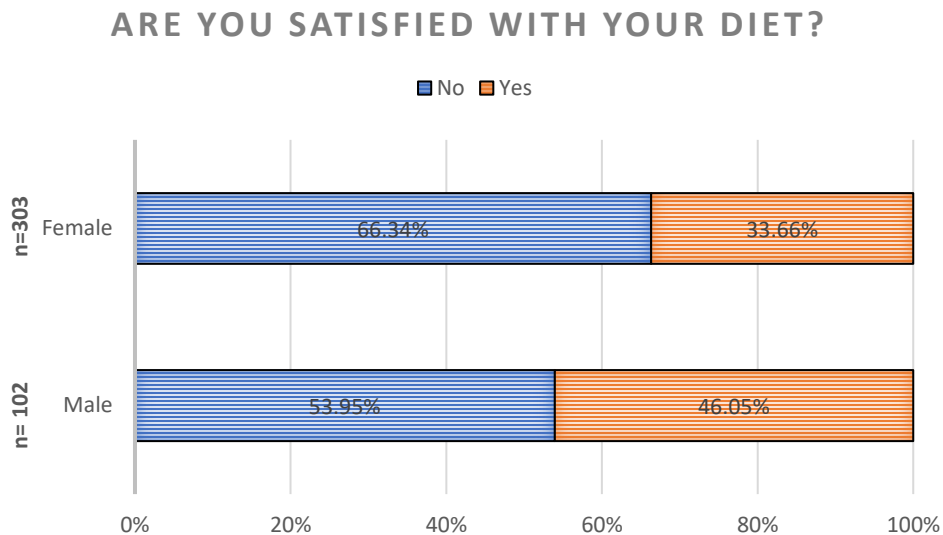


Figure 3

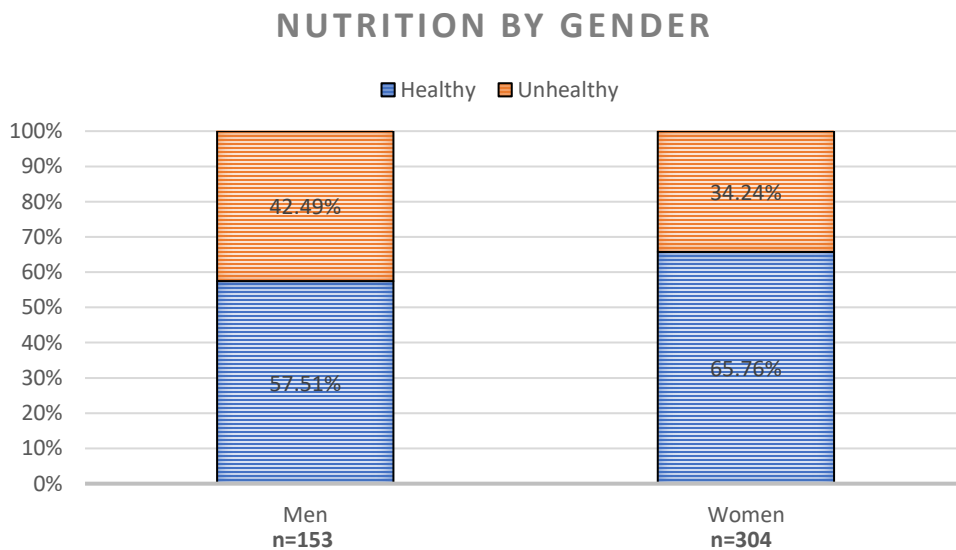


Figure 4

## **Discussion**

The primary objective of this paper was to find if a relationship exists between student income and diet. Although income does not statistically predict nutrition, findings in this paper suggest that further analysis of income groups could find significant predictors of nutrition. Additionally, it's important not to discount the importance and impact that additional income may have on students' decisions. Although this study finds students who suffer from a lack of funds to have lower self-assessed nutrition, scenarios using additional funding to initiate positive nutrition transformations reported promising results. Of students suffering from a lack of funds (n=159), 69.17% claimed they would add a healthy item to their grocery cart if they were provided an additional \$15 of funding. Of the students who do not suffer from a lack of funds (n=302), only 60.90% claimed they would add a healthy item to their grocery basket given the same situation. This suggests that students under financial stress could lead healthier lifestyles under improved financial circumstances.

Before acknowledging regression results for H2, Figure 2 clearly illustrates a positive, upward trend in nutrition relative to grade in school. This trend can be most clearly explained by examining students in their first and last year of college. Because freshmen are typically on a meal plan, their meals could regularly consist of fast food meal trade options available on the University of Arkansas campus and items of low-nutrition that are provided by dining halls. Additionally, freshmen may overindulge in low-nutrition food items because they've yet to develop healthy autonomous decision-making habits. Some reasons that upperclassmen might move away from consuming less healthy foods are that students become older and recognize healthy eating habits as a priority, metabolisms slow down, and almost all seniors live off-campus where they can control their diets more easily by cooking for themselves.

Finally, I find evidence that receiving an allowance from parents could negatively impact the nutrition of a student. Understanding how to address this circumstance is challenging—full-time students may need parental support in order to pay for expenses such as food. One solution could be for parents to explore ways they can non-monetarily support their children. For example: if parents want to support their child’s food expenses while promoting healthy dietary habits, they could purchase a Hello Fresh™ membership for their child which delivers ready to cook, healthy meals to customers’ doors.

### **Limitations**

This study was not without its limitations. For instance, the student population was only studied at one university in one state. In the state of Arkansas, where this study was conducted, the obesity rate reached 35.7% in 2016 which was the third highest rate in the United States (stateofobesity.org, 2017). Although only 55% of students are Arkansas residents, its bordering states maintain similarly high rates (University of Arkansas Enrollment Report, 2018). These distinct trends in the region are likely reflected in the results of this paper.

Additionally, freshmen are required to purchase a meal plan from the university, which regularly accounts for their three main meals of the day. Therefore, freshmen likely only purchase snack food when visiting the grocery store. This compromises the model because the three items lowerclassmen are likely spending the most amount of money on are more likely to be snack foods relative to upperclassmen who are likely spending the most amount of money on meal items. While this paper contributes to the understanding of general health trends in the college age population, similar research that could control for this limitation would be beneficial for the continuity of the model.

Finally, using survey data for research can be unreliable. When drawing conclusion from my analysis, I must rely on the validity of the information provided to me by the student participants. Because of complications, such as the social desirability bias, data collected for this paper and used to measure nutrition could be overstated or misconstrued. Additionally, participation in my survey was incentivized by the chance to win a \$50 Amazon gift card in exchange for participation. However, students were not incentivized to answer questions accurately; rather, they were incentivized to merely complete the survey. Because of this, students could have rushed through the survey and provided inaccurate information along the way.

## **Conclusion**

In this study, I examine how income and other determinants affect nutrition for students enrolled at the University of Arkansas. The results of statistical tests and aggregate analysis indicate that income does not significantly predict nutrition in this context but suggest that senior status and women significantly, positively predict nutrition, while allowance negatively predicts nutrition. Understanding the determinants of nutrition at the collegiate level contributes to the overall conversation regarding nutrition using a population in a stage of life that could be crucial in habit formation. Because of previously discussed limitations to this experiment, further research is needed to confirm the results of this paper.

These findings suggest that a need exists for a nutrition intervention for lowerclassmen. Educating freshmen about nutrition during their first year of autonomous decision-making regarding food could be tremendously beneficial to their diets. Introductory courses at the university, such as university perspectives, should integrate nutritional education into the

curriculum. Skills taught in this course should include learning how to budget for healthy food, identifying resources and tools at their disposal, and emphasizing the implications of maintaining poor eating habits throughout their four years in college and beyond. Additionally, parents who provide their children with an allowance may want to reevaluate their financial support as it may lead to relatively unhealthier behaviors.

College is a unique environment that involves various transitions and circumstances for most students. Because of this, I believe further research conducted in collegiate environments should be a priority. Understanding the significant determinants to nutrition can help design policy that improves the current nutritional environment that exists in the United States and mitigate the monetary and health consequences of poor diet choices.

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**Zachary J. Ward, M.P.H., Michael W. Long, Sc.D., Stephen C. Resch, Ph.D., Catherine M. Giles, M.P.H., Angie L. Cradock, Sc.D., and Steven L. Gortmaker, Ph.D.** ‘Simulation of Growth Trajectories of Childhood Obesity into Adulthood’

## Appendix (1): Categorization Guidelines

### The American Heart Association's Diet and Lifestyle Recommendations

A healthy diet and lifestyle are your best weapons to fight cardiovascular disease. It's not as hard as you may think! Remember, it's the overall pattern of your choices that counts. Make the simple steps below part of your life for long-term benefits to your health and your heart.

#### **Eat a variety of nutritious foods from all the food groups.**

You may be eating plenty of food, but your body may not be getting the nutrients it needs to be healthy. Nutrient-rich foods have minerals, protein, whole grains and other nutrients but are lower in calories. They may help you control your weight, cholesterol and blood pressure.

#### **Eat an overall healthy dietary pattern that emphasizes:**

- a variety of fruits and vegetables,
- whole grains,
- low-fat dairy products,
- skinless poultry and fish
- nuts and legumes
- non-tropical vegetable oils

Limit saturated fat, trans fat, sodium, red meat, sweets and sugar-sweetened beverages. If you choose to eat red meat, compare labels and select the leanest cuts available.

One of the diets that fits this pattern is the DASH (Dietary Approaches to Stop Hypertension) eating plan. Most healthy eating patterns can be adapted based on calorie requirements and personal and cultural food preferences.

#### **Eat less of the nutrient-poor foods.**

The right number of calories to eat each day is based on your age and physical activity level and whether you're trying to gain, lose or maintain your weight. You could use your daily allotment of calories on a few high-calorie foods and beverages, but you probably wouldn't get the nutrients your body needs to be healthy. Limit foods and beverages high in calories but low in nutrients. Also limit the amount of saturated fat, trans fat and sodium you eat. Read Nutrition Facts labels carefully — the Nutrition Facts panel tells you the amount of healthy and unhealthy nutrients in a food or beverage.

#### **As you make daily food choices, base your eating pattern on these recommendations:**

- Eat a variety of fresh, frozen and canned vegetables and fruits without high-calorie sauces or added salt and sugars. Replace high-calorie foods with fruits and vegetables.
- Choose fiber-rich whole grains for most grain servings.
- Choose poultry and fish without skin and prepare them in healthy ways without added saturated and trans fat. If you choose to eat meat, look for the leanest cuts available and prepare them in healthy and delicious ways.

- Eat a variety of fish at least twice a week, especially fish containing omega-3 fatty acids (for example, salmon, trout and herring).
- Select fat-free (skim) and low-fat (1%) dairy products.
- Avoid foods containing partially hydrogenated vegetable oils to reduce trans fat in your diet.
- Limit saturated fat and trans fat and replace them with the better fats, monounsaturated and polyunsaturated. If you need to lower your blood cholesterol, reduce saturated fat to no more than 5 to 6 percent of total calories. For someone eating 2,000 calories a day, that's about 13 grams of saturated fat.
- Cut back on beverages and foods with added sugars.
- Choose foods with less sodium and prepare foods with little or no salt. To lower blood pressure, aim to eat no more than 2,400 milligrams of sodium per day. Reducing daily intake to 1,500 mg is desirable because it can lower blood pressure even further. If you can't meet these goals right now, even reducing sodium intake by 1,000 mg per day can benefit blood pressure.
- If you drink alcohol, drink in moderation. That means no more than one drink per day if you're a woman and no more than two drinks per day if you're a man.

Follow the American Heart Association recommendations when you eat out, and keep an eye on your [portion sizes](#).

## Appendix (2): Survey

### Consent

University of Arkansas  
Consent to Act as a Research Subject  
Economics Experiment

Sam M. Walton College of Business student, Alyssa Hicks, is conducting a research study about food choices of college students. The purpose of this research is to better understand the food choices and overall diets of college students.

You have been asked to participate in this study because you are a citizen of the United States of America who is 18 years of age or older. There will be approximately 250 total participants in this study.

Participating in this survey will take approximately 7 minutes. You will be asked multiple choice and free response questions regarding your demographics and diet specifics. Additionally, there is a question where you will be asked to submit a picture of a personal grocery receipt using your cell phone camera.

If you have questions, comments, concerns, or need clarification on a question, please contact Principle Researcher, Alyssa Hicks (anhicks@uark.edu) or Faculty Advisor, Andy Brownback (abrownback@walton.uark.edu). If, at any point, you are uncomfortable answering the questions, you reserve the right to leave the survey. If you have questions or concerns regarding your rights as a research participant, please contact the IRB coordinator, Ro Windwalker (irb@uark.edu). Your completion of the survey indicates your consent to use your responses in this research.

Participation in this survey is voluntary and refusing to participate will not adversely affect any other relationship with the University or the researchers. If you agree to participate in this study, please select "yes" below.

- Yes
- No

**Instructions:** The following survey will take approximately 7 minutes to complete. Before you begin, make sure you have sufficient time and that you have a copy of a recent grocery shopping receipt (you will be asked to take and upload a picture of it later, which you can easily do with your smartphone).

If you need to leave the survey, you can return at any time to complete it. If you use the same device, the survey will restart where you left off.

What is your age?

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What is your gender?

- Male
- Female

What year are you in school?

- Freshmen
- Sophomore
- Junior
- Senior

What college are you in?

- Dale Bumpers College of Agricultural, Food and Life Sciences
- Fay Jones School of Architecture and Design
- J. William Fulbright College of Arts and Sciences
- Sam M. Walton College of Business
- College of Education and Health Professions
- College of Engineering
- School of Law
- College not listed

Growing up, what was your family's ZIP code?

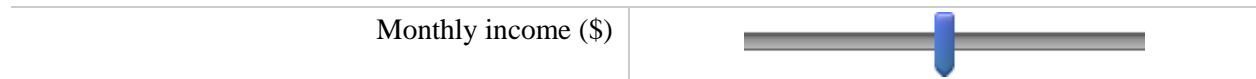
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Which of the following do you identify with?

- American Indian or Alaska Native
- Asian
- Black or African American
- Hispanic, Latino, or Spanish origin
- Middle Eastern or North African
- Native Hawaiian or Other Pacific Islander
- White
- Other \_\_\_\_\_

What is your monthly income from outside employment? (Excluding allowances/scholarships)

0      500      1000      1500      2000



How do you get money in general?

- Employment
- Scholarships
- Parental support

- Government support
- Other \_\_\_\_\_

Where do you receive food from?

- Campus dining halls
- Family members
- Food banks
- Sorority/fraternity
- Work
- Other \_\_\_\_\_

What grocery store do you shop at most often?

- ALDI
- Harps
- Walmart
- Whole Foods
- CV's Savers Club
- Ozark Natural Foods
- Natural Grocers
- Other \_\_\_\_\_

How often do you go to the grocery store?

- More than once a week
- Once a week
- Every other week
- Once a month
- Less than once a month
- Never

Where do you get your funds for groceries?

- I pay for them
- My parents pay for them
- My parents and I split the cost
- Other: \_\_\_\_\_

Do you receive an allowance of any sort from a family member? If so, how much?

- Yes
- No

How much is your monthly allowance? (Enter a number only, no "\$")

\_\_\_\_\_

Do you have any food staples that prompt you to make a trip to the grocery store if you run out?  
For example: do you always go to the store when you run out of milk? If so, what are they?

- Yes
- No

Please list any staples:

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List 3 items you spend the most money on, on average, every month:

Item 1 \_\_\_\_\_

Item 2 \_\_\_\_\_

Item 3 \_\_\_\_\_

Imagine the following scenario:

You receive an extra \$15 to spend on groceries this month, what item(s) would you add to your grocery basket? Or, what item would you purchase more of?

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Imagine the following scenario:

You must spend \$15 less on groceries this month, what item(s) would you eliminate from your grocery basket?

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What grocery item(s) do you always buy no matter the price?

---

Do you often leave the store with items you didn't intend to purchase beforehand?

- Often
- Sometimes
- Never

Do you believe your eating habits would change if you had more money to spend on groceries?

- Yes
- No

How?

- I would purchase organic versions of the same foods (1)
- I would purchase nicer brands of the same foods
- I would purchase more fruits and vegetables
- I would purchase more snacks
- I would purchase more meat
- Other \_\_\_\_\_

Have you ever participated in a diet for your nutritional health? Describe:

- Yes \_\_\_\_\_
- No

Do you always eat the type of diet you want?

- Yes
- No

Why not? Why not?

- Lack of funds
- Lack of time
- Lack of cooking knowledge
- Convenience of prepackaged/fast foods
- Provided food by sorority or fraternity
- Surrounded by unhealthy diet influences
- Difficulty in changing habits
- Other \_\_\_\_\_

What changes would you like to make?

- Purchase more non-GMO, organic, natural, free-range, cage-free, grass-fed, etc.
- Shift to vegetarian diet
- Shift to vegan diet
- Incorporate more fruits and vegetables
- Incorporate more whole grains
- Consume better tasting food
- Increase overall nutritional value of diet
- Reduce sugar
- Other (9) \_\_\_\_\_

Tell me about your diet:

---

Provided Receipt

<b>TRADER JOE'S</b>	
8600 Ward Parkway Suite 1020 Kansas City, MO 64114 Store #720 - (816) 333-5322	
OPEN 8:00AM TO 9:00PM DAILY	
APPLES	3.99
PEANUT BUTTER	2.99
POTATO CHIPS	2.69
MILK CHOCOLATE CARAMEL BAR	0.99
ANGEL HAIR PASTA	1.49
TOMATOES	2.49
BACON	6.09
ENGLISH MUFFINS	3.49
BANANAS	0.57
ORANGE JUICE	2.98
GREEK YOGURT	1.39
CHICKEN THIGHS	5.79
3 LBS WHITE RICE	3.99
PANCAKE MIX	2.99
EGGS	2.79
BLUEBERRY MUFFINS	3.99



On a scale of 0-10, how do you perceive the nutritional value of the receipt above? (0=poor, 10=excellent)

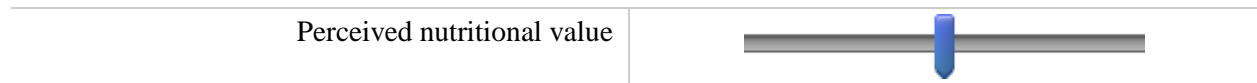
0 2 4 6 8 10



Last question: Please upload a quick photo of a recent grocery receipt (simply click the area below to take/upload a photo using your cell phone or computer). If you don't currently have a receipt, you can reopen this survey at a later time when you have a one to complete it:

Personal Receipt0-10 On a scale of 0-10, how do you perceive the nutritional value of the items on the receipts you provided? (1=poor, 10=excellent)

0 2 4 6 8 10



Gift card

Thank you for completing this survey.

If you would like to be entered to win a \$50 Amazon gift card for your participation, please enter your @uark email below.

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