EXPLORING THE IMPACTS OF THE FIRST YEAR EATS PROGRAM DURING SOPHOMORE YEAR

An Undergraduate Research Scholars Thesis

by

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Submitted to the LAUNCH: Undergraduate Research office at
Texas A&M University
in partial fulfillment of requirements for the designation as an

UNDERGRADUATE RESEARCH SCHOLAR

Approved by
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May 2023

Major: Statistics

RESEARCH COMPLIANCE CERTIFICATION

Research activities involving the use of human subjects, vertebrate animals, and/or biohazards must be reviewed and approved by the appropriate Texas A&M University regulatory research committee (i.e., IRB, IACUC, IBC) before the activity can commence. This requirement applies to activities conducted at Texas A&M and to activities conducted at non-Texas A&M facilities or institutions. In both cases, students are responsible for working with the relevant Texas A&M research compliance program to ensure and document that all Texas A&M compliance obligations are met before the study begins.

I, Erin E. Batta, certify that all research compliance requirements related to this Undergraduate Research Scholars thesis have been addressed with my Faculty Research Advisors prior to the collection of any data used in this final thesis submission.

This project did not require approval from the Texas A&M University Research Compliance & Biosafety office.

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A major issue faced by many college students is food insecurity. Students who lack quality food often have lower grades and poorer mental health than those who have access to the food they need. The First Year Eats (FYE) program at Texas A&M University aims to address this problem by providing freshman students in need with food and cooking lessons. The goal is to help students not only have quality food, but also learn skills that will help them be healthier and more confident in general. In the past three years, this program has been evaluated to determine its effect. A comparison of FYE to non-FYE freshmen showed that FYE students tend to achieve higher grades, be less stressed and have better emotional wellbeing.

To continue this research, I have analyzed sophomore students, comparing those who were formerly in FYE to those who were not. I used a student wellbeing survey and two years of sophomore grades to identify differences between these two populations.

Results showed that former FYE students still had higher GPRs in the first semester of their sophomore year than non-former-FYE students. This indicates that the impact of the FYE program lasts beyond just the time that students are involved in it. Furthermore, those students who had participated in FYE also reported being more likely to consider health when shopping at the grocery store, compared to students who were not in FYE. Lastly, results indicated that FYE students were less likely to withdraw from the university within their first 4 semesters.

In the future, it would be of interest to compare graduation rates between FYE students and non-FYE students. As the program grows and develops, researchers could also investigate which methods are most effective in increasing participation and involvement. Additionally, based on the promising results from this study, it would be encouraged for other colleges to adopt similar programs that could achieve positive effects on their students as well.

ACKNOWLEDGEMENTS

Contributors

I would like to thank my faculty advisors, Dr. Alan Dabney and Dr. Sumana Datta, for their guidance and support throughout the course of this research. Their advice and support greatly enabled me to improve my work and explore new ideas.

Thanks also go to Jasmine Tran for allowing me to learn from her as she conducted undergraduate research the previous year. Additionally, I would like to thank my former and current advisor, Alyssa Brigham and Courtney Shuttlesworth, respectively. Their guidance and support as I navigate college have improved my experience greatly.

Finally, thanks to my family and friends for their encouragement and support throughout this process.

All other work conducted for the thesis was completed by the student independently.

Funding Sources

Undergraduate research was funded by Innovation(X) and the Texas A&M Foundation in previous years, and the data from these years are still being used in this project.

This research was funded and supported by LAUNCH and the Association of Former Students at Texas A&M University. Lastly, I would like to thank and acknowledge HEB for supporting the First Year Eats program through its generous donations.

NOMENCLATURE

FYE	First Year Eats
NFYE	Non-First Year Eats
GPR	Grade Point Ratio
UIN	Universal Identification Number

1. INTRODUCTION

1.1 Food Insecurity and its Effects on Students' Wellbeing

Food insecurity, or the inability to access the needed quantity and quality of food, is a widespread problem that causes significant harmful effects. This issue can affect people of all ages and backgrounds, and it is not always obvious when someone is experiencing it. In particular, food insecurity causes noticeable problems for young people in a college environment. Many students throughout the country are unable to access the food they need, which in turn damages many other aspects of their lives, such as their grades, their mental health, and certainly their physical health.

According to a study discussing this issue, many researchers may underestimate the true percentage of college students suffering from food insecurity. In fact, this problem could even affect as many as half of all college students (Nazmi et al., 2019). Since it impacts such a large proportion of university students, it is of significant value to research this issue in more depth. Furthermore, food insecurity can lead to many negative outcomes in students, both from a physical and mental standpoint. For example, it can be extremely difficult for students who lack sufficient food to maintain high grades and find time for involvement in important opportunities.

Demonstrating this, a different study indicated that food insecurity is associated with poor grades, and at the specific school being researched, food secure students had a mean GPR of 3.51, while food insecure students had a lower mean GPR of 3.33 (Hagedorn & Olfert, 2018). This is highly relevant, since many young people pursue a college education specifically for the purpose of rising out of financial instability, and being successful academically opens up more opportunities for future success. Students experiencing food insecurity are also more likely to

exhibit indicators of poor mental health (Martinez et al., 2020). In order to care for both the physical and mental health of college students and help them achieve long-term success, the problem of food insecurity must be addressed.

A related issue is that many college students experience practical barriers to healthy eating. This problem can arise for numerous reasons. Certainly, a lack of money to spend on high-quality food is one of the main issues, but it is one of many problems to address. According to one study where participants were able to write out answers in their own words, many students do not have the financial resources they need to acquire healthy food. Some students also reported struggling to find transportation to grocery stores and accessing the types of ingredients they wanted to cook (Murray et al., 2016). It is important for students not only to have enough food, but to have the right food so that they can properly take care of their health enough to function well in school. It remains a significant challenge to educate college students about nutrition and make a healthy diet achievable for all.

With all of these negative impacts adding together, college can be a daunting experience for young people struggling to obtain the food they need and attend to their basic needs. Consequently, it is important to study this further and identify programs that are successfully helping students battle food insecurity.

1.2 Issues with Current Strategies to Alleviate Food Insecurity

Throughout the country, there are efforts being made to reduce food insecurity with varying levels of effectiveness. One of the main ways this is done is through the use of food banks or food pantries. However, while this approach can help some students, there is research showing that many students do not utilize these resources for various reasons.

In one study of food pantries for college students, only 15.6% of students who reported being aware of the food pantry actually used it. It is important to note that this is the total sample, which included both food secure and food insecure students. However, in the groups for low food security and very low food security, the percentages of students who used the food pantry were 69.2 and 69.6, respectively. Furthermore, 28.8% of students with low food security reported experiencing barriers to using the food pantry, and for those with very low food security, that rate was 34.1%. Students also provided information about what prevented them from visiting the food pantry. Among these reasons were social stigma, unclear information about the program, the idea that they aren't struggling enough to warrant going to a food pantry, and hours that were not convenient for visiting the pantry {El Zein, 2018 #9}.

This understanding of the issues with many current attempts to fight insecurity provides a basis for evaluating the First Year Eats (FYE) program at Texas A&M University, which is the focus of my research. It is important to evaluate how this program works differently and what impact it has.

1.3 How to Evaluate Student Success and Wellbeing in Relevant Populations

Secondly, since the aim of my research is to evaluate success in students who received assistance to combat food insecurity, it is important to understand the population at hand. Most of the students being studied are first generation, underrepresented, or low-income students. A study discussed in the book *College in Black and White: African American Students in Predominantly White and in Historically Black Public Universities* found that, on average, white students completed 15.3 credit hours per semester, while black students completed 14.4 credit hours per semester. Additionally, white students had a statistically significantly higher mean GPR than black students {Allen, 1991 #11}. In another study of university students, first-

generation students were more likely to withdraw from college before graduating, in comparison to continuing-generation students. These first-generation students also rated themselves as less involved with their community and less committed to personal health and fitness than their continuing-generation counterparts {Penrose, 2002 #12}. All of these results provide useful context for understanding the population that will be studied in this research and what problems this population has historically faced.

A relevant question to consider is how to measure or predict success in this population specifically, since they face unique challenges. The students being studied may have access to fewer resources or business connections than their peers. For this reason, it may not be appropriate to measure success in the same way that one would measure success in the population in general, such as by using only indicators like grades, graduation rates, and acquisition of internships. Success and wellbeing for this population can be measured by many different indicators, such as involvement, attitudes about education, grades, retention rates, interactions with faculty members, views on health and nutrition, and many others.

One study suggested that in first generation students, "academic integration," or the degree to which students are content with and fit into the academic life of the campus, is positively related to grades. Furthermore, it showed that students with higher aspirations for their education were more likely to have higher grades (Strayhorn, 2007). These findings could provide insight for survey questions that could measure how successful a student is or will be. With this in mind, it can be of use to assess how well students build relationships with faculty and participate in the academic life at college, as these could be useful markers of success.

Interestingly, some research has shown that while a moderate amount of involvement in co-curricular activities is correlated with an increase in GPR compared to no involvement, too

much involvement is related to a decrease in GPR. In other words, this indicates that the relationship between number of hours spent on co-curricular activities and GPR is not linear and not always positive. Specifically, the study in question identified 1-5 hours per week as the optimal amount of time to participate in co-curricular activities {Zacherman, 2014 #8}. This is important to note when analyzing survey data about level of involvement.

Furthermore, since the FYE program was specifically designed to teach students about cooking and health, it is also of significant value to assess students in this way. Student success in this area can be measured by evaluating a student's consideration of physical health and confidence both with cooking and with sharing their skills with others.

1.4 The Impact of the First Year Eats Program in Previous Years

The FYE program has existed since the 2019-2020 academic year. This program works to combat food insecurity in Texas A&M University students by offering cooking lessons and groceries to students in need. Rather than simply giving food, as many programs do, FYE emphasizes the goal of creating a community and teaching students about cooking and health, in addition to providing food to students at no cost. It seeks to fight food insecurity while also being conscious of the stigma that affects many young people and influences the ways they find help. A study to evaluate this program has been conducted each year beginning with the 2019-2020 academic year, making this the fourth year of the program and of the research about it.

Previous research about FYE has indicated that among those struggling with food insecurity, students in FYE had higher grades, compared to students who were not in the program. In the study at this university during the 2021-2022 academic year, FYE students had an average GPR of 3.176 for the fall semester, while those students who were not in FYE had an average GPR of 2.902 for the same semester. Additionally, in this same fall semester,

underrepresented minority students actually had a higher mean GPR than students who were not underrepresented minorities, a finding which is groundbreaking in the context of previous research about the academic performance of minority students (Tran 2022). This is certainly positive news already, as it leads us to believe the program truly is alleviating the effects of food insecurity and leveling the playing field for students of different races. In addition to the obvious benefit of providing meals to those in need, the program appears to help these students improve their grades. In light of this, an important question to consider is what effects of this program are noticeable beyond freshman year. It is beneficial to understand if sophomores who were previously involved in FYE continue to show higher levels of success and wellbeing, compared to sophomores who were not previously in FYE. The answer to this question would provide a better understanding of whether these improvements continue to last after a student leaves the program.

For this reason, I researched students at Texas A&M University by conducting a survey to measure their overall success and wellbeing. This survey addressed many of the markers of success mentioned above, as well as some more specific ones related to details of their college experience. Since the survey was sent out at the beginning of the school year (before current sophomores had experienced any of their year), the survey was sent to juniors and seniors, who were instructed to answer the questions with regard to their sophomore year. The students who received the survey link were a mix of former FYE and non-FYE students. All of these students were involved in one of three learning communities during their freshman year that would have made them eligible for participation in FYE. These three learning communities were called Century, GTF, and Brownsville. However, some of these students participated in FYE, while

others did not, and this is the distinction between FYE and non-FYE students in the context of this research.

2. METHODS

In this project, the primary form of data collection was a survey about students' welfare and success. This survey mainly asked qualitative questions about interactions with faculty, general involvement in activities and jobs, attitudes about health, living situation, confidence in social situations, and other related topics. After enough responses were received to yield reliable results, the initial analysis was done regarding these data. Once this first analysis was complete, I accessed the students' GPRs and found which semesters they attended the university. This allowed me to perform further analysis comparing grades and retention rates between FYE and NFYE students.

2.1 Student Wellbeing Survey

The primary form of data collection was a survey measuring student success and wellbeing. This survey was in part taken from a dissertation by Kevin Ung regarding the success of first-generation college students {Ung, 2019 #7}. This survey was chosen because it measured success in ways that are more widely applicable to first-generation, underrepresented, and low-income students, as well as because it included a good variety of topics. I extended the survey by adding several questions of my own that related to the students' cooking and eating habits. In order to reduce the survey to approximately its original length, I removed a few questions that were irrelevant to my research goals. The full survey can be found in figure A.1 in the Appendix.

This survey was sent to current juniors and seniors who were in one of the three learning communities mentioned previously during their freshman year, and these students were instructed to answer the questions with regard to their sophomore year. 196 former FYE students and 413 former NFYE students received the survey link. The survey was administered through

Google Forms, and UINs were collected at the beginning to distinguish between former FYE and former NFYE students. In total, 114 students responded to the survey. 54 of these respondents were former FYE members, while the other 60 were former NFYE members.

In total, the survey contained questions about relationships with faculty, leadership positions in organizations, general involvement in activities, living situation, and cooking and eating habits. Different questions had different types of answer choices. Some were considered categorical answer choices with no obvious ordering. For example, a question about living situation included several common types of housing with no particular order or numbering. On the other hand, some questions had categorical answer choices with an order, so called "ordinal" variables, and these could be numbered and analyzed using numeric tests. Other questions asked about the number of hours per week that a student participated in a certain activity or other similar numeric questions, which were also analyzed with numeric tests. For these last two types of questions, answers were recoded as 0,1,2, etc.

The demographic information of the 114 students who responded to the survey is summarized in Table 1 and Table 2 below. Table 1 shows the breakdown for gender, FYE status, and ethnicity. Table 2 shows the breakdown for race. It is important to note that the majority of responses came from underrepresented minority students. We were able to achieve similar numbers of responses for FYE and NFYE. One challenge was that far more female students responded to the survey than male students. Ideally, we would have received equal numbers of responses for each gender, but since students freely decide whether to take part in the survey, there is no simple way to avoid this.

Table 1: Table of Gender, FYE Status, and Hispanic/Latino Status of Survey Respondents

Male	19	**FYE**	54	**Hispanic or Latino**	87
Female	95	**NFYE**	60	**Not Hispanic or Latino**	27
Total	114	**Total**	114	**Total**	114

Table 2: Table of Races of Survey Respondents

White	59
Black	5
Asian	14
American Indian / Alaskan Native	12
Native Hawaiian or Other Pacific Islander	1
2 or More Races	3
NA	20
Total	114

2.2 Wilcoxon Tests and Fisher's Exact Tests for Survey Data

To perform the initial analysis of the survey data, I created histograms of the distributions of results for each question. Since most sets of responses did not appear to be normally distributed, I chose nonparametric statistical tests that do not require that data come from normal

distributions. I performed a Fisher's Exact Test for each of the survey questions with unordered categorical answer choices, and I used a Wilcoxon Test for the questions with numeric answers (or ordinal categorical answers I could appropriately recode into numeric answers). Since all questions were multiple-choice, I had to recode answer choices that were numeric or ordinal into integer values in order to perform the Fisher's Exact Tests.

2.3 Cluster Analysis of Survey Data

In order to determine how the data grouped together, I performed cluster analysis. I organized the data first by individual participant, using hierarchical clustering. After identifying an optimal number of clusters based on a dendrogram, I sorted the individuals into their clusters and explored the discovered clusters to find patterns in the original variables that distinguished the cluster from one another. I created histograms and boxplots of each cluster for each numeric variable and summarized the differences I discovered.

Secondly, I clustered by variable in order to identify which variables tended to fluctuate together. For this part of the analysis, I performed k-means clustering and split the variables into two groups.

2.4 Analysis of Grades

To look at my question from a different angle, I also studied grades. I created histograms of the distributions of GPR for both semesters of sophomore year, and since the data did not appear consistently normal, I then performed Wilcoxon tests. In the first test, the two populations I compared were FYE fall semester GPR and non-FYE fall semester GPR. In the second test, the two populations I compared were FYE spring semester GPR and non-FYE spring semester GPR. All of these grades were from sophomore year.

There were 226 FYE students total. 216 of these students had grades available (i.e., they were still at the university) for their fall semester of sophomore year. 209 of these students had grades available for their spring semester of the same year. As for NFYE students, there were 485 total. Since there was a larger number of them, I was not able to obtain all of the data for each of these students, but the sample sizes were still large. I had 442 students' grades for the fall semester and 281 for the spring semester.

2.5 Linear Regression

I created several regression models to better understand the data. Firstly, I made models without interaction terms. GPR was the response variable, and the predictors were first-generation status, ethnicity, and FYE status. The models were of the following form:

$$Y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 \quad (1)$$

In this model, Y indicates the GPR of the student, while x_1, x_2, and x_3 represent the student's first-generation status, ethnicity, and FYE status, respectively. I created one model for fall GPR and one model for spring GPR.

Next, I fitted models that did include interaction terms. The form of the new models was as follows:

$$\begin{aligned} Y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 \\ + \beta_4 x_1 x_2 + \beta_5 x_1 x_3 \\ + \beta_6 x_2 x_3 \\ + \beta_7 x_1 x_2 x_3 \end{aligned} \quad (2)$$

Lastly, I created a third type of model that did include interaction terms but removed FYE as a covariate. Thus, any interaction terms involving FYE were excluded. I then performed a likelihood ratio test between the second and third models to determine the overall impact of FYE as a predictor of GPR.

2.6 Analysis of Retention Rates

The final segment of my analysis consisted of studying the withdrawal rates of FYE students. My goal was to measure the association between FYE status and retention rates. I collected GPRs for FYE and NFYE students for their first four semesters and noted whether each student had successfully completed all of these semesters. I categorized students who left the university before completing their first four semesters together in Group 1 for the 'Withdraw' variable, and I categorized those who completed all four semesters in Group 0 for this variable.

Next, I created a logistic regression model with 'Withdraw' as the response variable and 'FYE' as the explanatory variable.

3. RESULTS

3.1 Results from Survey Data

The first results obtained were from the survey data. As mentioned previously, Wilcoxon tests and Fisher's Exact tests were performed on these data, depending on the type of answer choices for each survey question.

Most of the survey questions did not yield statistically significant results. In other words, the differences between FYE and NFYE student responses were not extreme enough to be considered significant. However, one question did provide very positive and significant results. This was a simple question asking students whether they consider health when they shop at the grocery store, and the answer choices were "yes" and "no." A Fisher's Exact Test was performed on the data from this question, and the resulting p value was .0468. Of the FYE students, 85.18519%, or 46 out of 54, responded "yes" to this question. On the other hand, of the NFYE students, only 68.33333%, or 41 out of 60, responded "yes."

A different survey question yielded moderately significant results. Students were asked to report how many hours per week they spend on co-curricular activities, and the answer choices were in categories, such as 0, 1-5, 6-10, 11-15, and so on. These categories were simply recoded as 0,1,2, etc. Since these data could be treated as numeric but did not appear to follow a normal distribution, I performed a Wilcoxon test. The p value for this test was .06992. Interestingly, the mean for FYE was lower than that of NFYE, indicating that FYE students reported spending significantly less time on co-curricular activities. The mean for FYE was 1.37037, while the mean for NFYE was 1.783333. Note that this is not the mean number of hours per week, but the mean on the new recoded scale where 1 means 1-5, 2 means 6-10, and so on.

3.2 Results from Grades Analysis

The analysis of sophomore grades yielded promising results. For fall GPR, I ran a Wilcoxon test, comparing FYE GPRs to NFYE GPRs. This test revealed a p value of .02306, meaning it is statistically significant, with the FYE GPR average being higher than the NFYE GPR average. The mean GPR for former FYE students was 3.201, while the mean GPR for former NFYE students was 3.092.

As for the spring GPRs for sophomore year, the former FYE students still performed better than their NFYE counterparts, although not to a statistically significant extent. This semester, the mean GPR for former FYE students was 3.205, and the mean GPR for former NFYE students was 3.171.

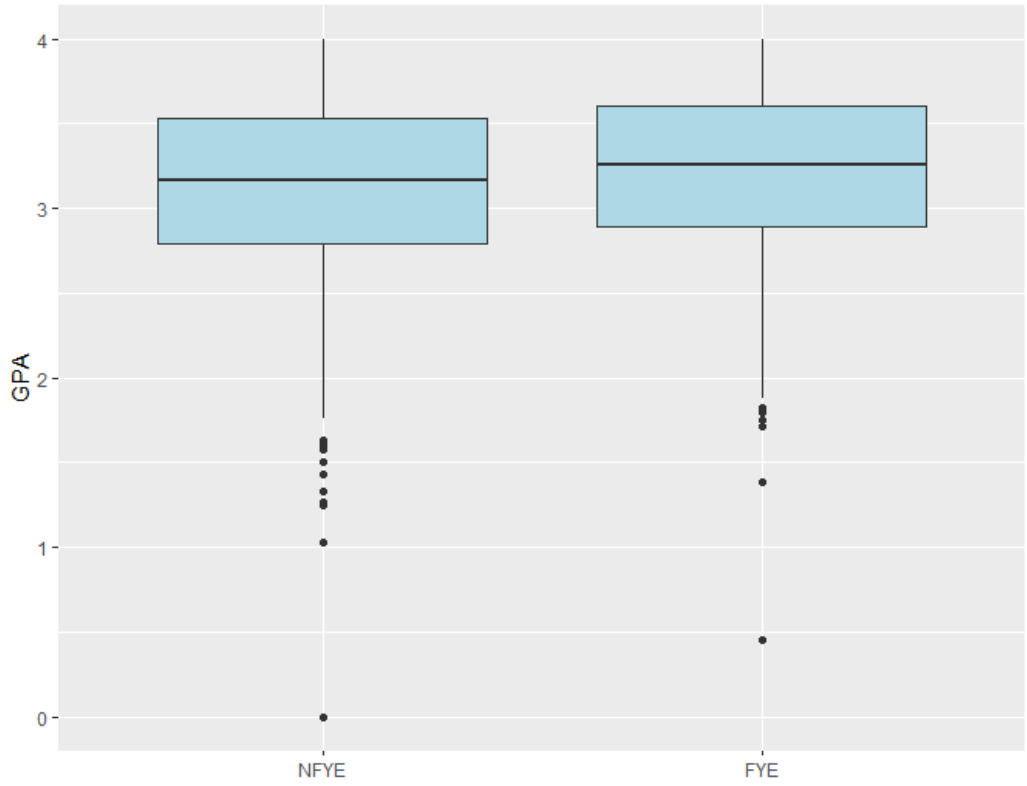

Figure 1: Boxplots of fall GPRs for FYE vs NFYE students

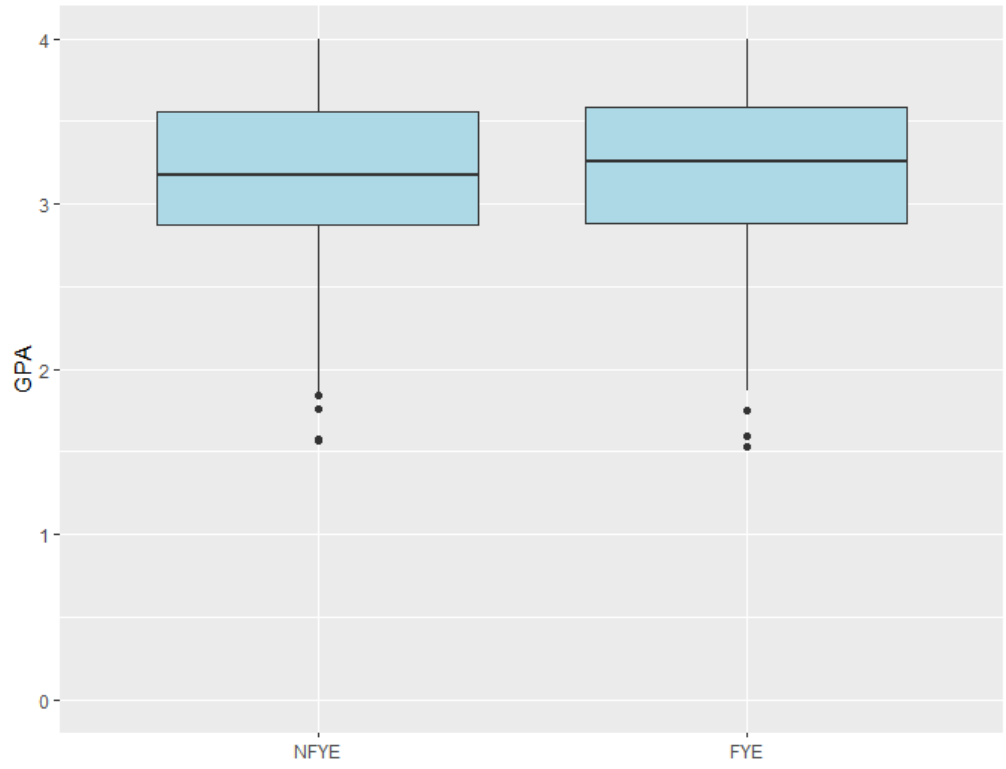

Figure 2: Boxplots of spring GPRs for FYE vs NFYE students

3.3 Results from Linear Regression

The linear regression models showed similar information in comparison with the Wilcoxon tests. For the fall semester, the model with equation (1) had an overall p value of 4.887e-08. More specifically, the ethnicities Asian and white both had positive coefficients, though neither were statistically significant. FYE also had a positive coefficient (suggesting that being in the FYE program was associated with higher average GPRs), but this one was significant with a p value of .00122. For the spring semester, the ethnicities Asian, Hispanic or Latino of any race, and white all had positive coefficients, though only Asian was statistically significant (with a p value of .0424). FYE had a positive coefficient and was moderately significant with a p value of .0743.

For each semester, I used a likelihood ratio test to compare the model with equation (2) to a model that removed any terms involving FYE. This is done as an assessment of whether FYE status is associated with GPR after adjusting for the other explanatory variables and their interactions. For the fall semester, the p value from this likelihood ratio test was .177. For the spring semester, the p value for the likelihood ratio test was .6667.

3.4 Comparison of Retention Rates

Another positive outcome of this research came with regard to retention rates. The model fitted using FYE as a predictor and withdrawing as the response had a p value of .084. The coefficient for FYE was -.5561. Since this coefficient was negative, it indicates that FYE students are less likely than NFYE students to withdraw from the university within their first four semesters. Specifically, 6.67% of FYE students withdrew within these first two years of college. On the other hand, 11.08% of NFYE students did so.

3.5 Findings From Cluster Analysis

After performing hierarchical clustering and visualizing it with a dendrogram, it became evident that the participants could reasonably be split into three clusters. I added a column in my dataset to identify the grouping of each observation, and then I created histograms and tables to identify differences between the three clusters.

The first group was the largest, containing 73 participants, 50.68% of whom were FYE students. This cluster had a lower mean for most of the variables involving participation in activities or jobs outside of school. It also had a lower mean for students' confidence making friends and cooking their own food. They had moderately positive interactions with faculty, compared with the other clusters.

The second cluster had 20 participants, 45% of whom were FYE students. This cluster was mainly characterized by high values for weekly hours of on-campus work. They had moderate values for confidence making friends and cooking food.

The third cluster had 15 participants, 40% of whom were FYE students. This cluster, in general, included more students who worked off-campus and who eat food they cooked themselves. This cluster's students worked very few hours on-campus, in comparison to the other two clusters.

3.6 Results That Were Not Statistically Significant

Two questions on the survey yielded results in which FYE students performed better than NFYE students on average, but not to a statistically significant degree. Both of these questions were analyzed with a Wilcoxon test. Firstly, this was the case with a question asking students how regularly they eat food they cooked themselves. The p value for this test was .2924. Similarly, this occurred with a question asking students about their level of confidence making new friends. For this question, the p value was .2320.

On the other hand, with a question about whether students teach cooking skills to others, NFYE actually had a very slightly higher proportion who answered yes, but it was not close to reaching statistical significance. The proportion for NFYE was .5667, compared to the .5556, which was the proportion for FYE. This difference was so slight that the p value for the Fisher's Exact Test was 1.

4. CONCLUSION

Overall, these results provide many indications that the FYE program is making a positive impact that lasts longer than just freshman year. Most importantly, FYE students were more likely to say they consider health when shopping, and they also had higher GPRs and lower withdrawal rates than their NFYE counterparts. We also saw evidence of a healthy amount of involvement in co-curricular activities.

4.1 Discussion

Firstly, with regard to the survey, it is encouraging to observe that most FYE students reported considering health when shopping at the grocery store. One of the goals of this program is to increase students' confidence with cooking and nutrition, so this result provides convincing evidence that this goal is being achieved in some way. It is also important to note that these answers pertain to students' sophomore year, meaning that the higher rate among FYE students appears to be an impact that persists even after the program is over. It is plausible, based on this result, that FYE students are learning about health and nutrition during their freshman year and remembering these skills later on.

Another result from the survey was that FYE students, on average, were much closer to being involved in 1-5 hours of co-curricular activities per week, while NFYE students were much closer to 6-10 hours per week on average. This result is positive in light of the research previously mentioned, which indicated that 1-5 hours of activities per week is associated with highest GPR. The FYE students were closer to this optimal level, compared to NFYE students. This could be a sign that FYE students are better able to manage their time effectively and avoid

being overcommitted. It is also encouraging to see that they are still, on average, involved in activities, which shows a healthy participation in the university and well-roundedness.

Secondly, another positive outcome was for the GPR comparison. Previously, research about this program has indicated that during freshman year, FYE students tend to have higher GPRs than NFYE students, but little has been previously discovered about these same students during their sophomore year. This year we saw that for the fall semester of sophomore year, FYE students still outperform NFYE students to a statistically significant degree. Even in the spring semester, this difference is no longer statistically significant, but FYE students still have a higher mean GPR. The loss of statistical significance in this second semester was simply due to NFYE students catching up and increasing their GPRs noticeably, which is certainly positive. This new result is extremely important because it, again, provides evidence for the argument that the FYE program is impacting students longer than just the time they are actually participating in it. Moreover, achieving higher grades is not just an indicator of FYE's success, but it is also of real benefit to students' futures and career opportunities.

Lastly, and perhaps most importantly, we see evidence that FYE students are more likely to stay at the university for at least two years. Before this project, not much was known about retention rates for FYE and NFYE students since the focus was on freshman year only. Now that this program is in its fourth year, there were enough data on this to perform the analysis, and the results were very positive. Discovering that FYE students had a withdrawal rate noticeably lower than NFYE students speaks volumes about the impact the program is having. This result supports the idea that FYE helps students overcome the difficulties of freshman year that cause many students to withdraw from the university, allowing them to remain in college and thrive.

Several questions were asked on the survey that did not yield significant results, and these outcomes provide important insight as well. It is good to see that FYE students, on average, were more likely to eat food they cooked themselves and be more confident initiating conversations and making friends. However, as shown in the results, these differences had fairly high p values, meaning they were not statistically significant. Modifications to the program should address these issues with the goal of reaching a statistically significant difference between FYE and NFYE students.

Furthermore, it is also disappointing that the proportions of FYE students and NFYE students that reported teaching cooking skills to others were so close to one another. It would be ideal to see FYE students learning to cook and letting it impact other areas of their lives, such as their interactions with friends. This is another topic that could be considered seriously when adapting the program.

4.2 Insight for FYE and Potential Future Research

Based on the results I have obtained, it might be beneficial to emphasize sharing food and recipes with others as a means of forming social bonds. If students could gain enough confidence and understanding of the need to share their skills, this program could cause a ripple effect that would impact many more students. While about half of students (for both groups) reported sharing recipes with others, this proportion could be increased as the program continues and evolves. This question in the survey was one where FYE students responded more positively than NFYE students, but not to a statistically significant degree. A similar situation was found with the survey question about confidence making friends and initiating conversations. In the future, I would hope to see these differences reach significance.

Furthermore, some students may not have many ingredients on hand or an easy way to make it to the grocery store regularly. They may also have dietary restrictions or allergies that prevent them from using certain ingredients in their cooking. It is also worth noting that some ingredients may be out of stock at the grocery store or too expensive for students to consistently purchase. For these reasons, it could also be helpful to identify different variations of recipes that are taught, as well as appropriate ingredient substitutions. This could help make the recipes more versatile and allow students to make slight modifications to fit their personal needs. If there is low turnout to certain events, it might also be a good idea to take a short survey at the beginning of the year asking students what they would like to learn how to cook. This could help ensure that the cooking lessons match what students want to learn about and align with their needs. Offering a survey also could improve the community atmosphere and remind the students that their needs are important and their requests are being taking seriously.

Additionally, there is opportunity for much more research on this subject. Since this program is only in its fourth year, all research has been about short-term impacts, which made sense with the data available. However, in several years, the first few classes of FYE and NFYE students will have graduated and there will be much more data about FYE students throughout all four years of college. In light of this, I believe comparing graduation rates between former FYE students and non-FYE students could be of significant interest. Analyzing graduation rates could provide useful insight into the longer-term impacts of the FYE program. This could be a beneficial extension of the research this year that analyzed withdrawal rates for the first two years of college.

Additionally, this project focused solely on sophomores since that was the highest year of college for which there were significant sample sizes available. In the future, it would be of

interest to perform the same analysis on juniors and seniors. This could tell us how long the statistically significant results from this project are noticeable in former FYE students. Juniors and seniors face different challenges and live different lifestyles than freshmen and sophomores, so it is important to study them as well to understand how the program impacts them. Just as with graduation rates, this would simply be easier in future years because more data would be available and the larger sample sizes would make the results more reliable and generalizable.

4.3 Broader Implications of These Results

As was discussed earlier, Texas A&M University is not the only university with a program to handle food insecurity. Many colleges have identified this problem and are attempting to mitigate it. However, one of the common ways this issue is addressed is through food banks or food pantries, which differ significantly from the FYE program. FYE actively works to fight food insecurity while being conscious and aware of the stigma surrounding the issue.

Therefore, it seems that while there are many concerns about the effectiveness of food pantries on college campuses, we have strong evidence that FYE is effective at improving the academic performance of students as well as helping them lead more healthy lives. Based on these results, it would be prudent for other universities around the country to consider establishing similar programs to FYE that address the issue of hunger from a more comprehensive perspective and take greater consideration of the barriers that students face when seeking help. It would also be advisable to conduct similar research to what is being done at Texas A&M as new programs are started to evaluate their impacts and improve them for the future. Ultimately, these programs should be assessed from multiple different standpoints

(impacts on grades, impacts on mental health, etc.) to get the clearest picture of the effect they have.

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APPENDIX

Student Survey 2022-2023

Please answer each question as if it is referring to your sophomore year when it says "current year" or something similar. Please use your TAMU email. Thank you for your participation!

Email*

(short answer response)

What is your UIN?

(short answer response)

Have you held or plan to hold a formal Leadership role in a student organization or group before you graduate?

- Have not decided
- Do not plan to do
- Plan to do
- Done or in progress

During the current school year, how often have you talked about career plans with a faculty member?

- Never
- Sometimes
- Often
- Very Often

During the current school year, how often have you worked with a faculty member on activities other than coursework (committee, student groups, etc.)?

- Never
- Sometimes
- Often
- Very Often

During the current school year, how often have you discussed course topics, ideas, or concepts with a faculty member outside of class?

- Never
- Sometimes
- Often
- Very Often

During the current school year, how often have you discussed your academic performance with a faculty member?

- Never
- Sometimes
- Often
- Very Often

Have you worked or plan to work with a faculty member on a research project before you graduate?

- Have not decided
- Do not plan to do
- Plan to do
- Done or in progress

About how many of your courses at this institution have included a community-based project (service learning)?

- None
- Some
- Most
- All

Which of the following best describes where you are living while attending college?

- Dormitory or other campus housing (not fraternity or sorority house)
- Fraternity or sorority
- Residence (house, apartment, etc.) within walking distance to the institution
- Residence (house, apartment, etc.) further than walking distance to the institution
- None of the above

About how many hours do you spend in a typical 7-day week participating in co-curricular activities (organizations, campus publication, student government, fraternity or sorority, intercollegiate or intramural sports, etc.)?

- 0 Hours per week
- 1-5 Hours
- 6-10 Hours
- 11-15 Hours
- 16-20 Hours
- 21-25 Hours
- 26-30 Hours
- More than 30 Hours

Indicate the quality of your interactions with faculty at your institution.

- 1 Poor
- 2
- 3
- 4
- 5
- 6
- 7 Excellent
- 9 Not applicable

About how many hours do you spend in a typical 7-day week working for pay on campus?

- 0 Hours per week
- 1-5 Hours
- 6-10 Hours
- 11-15 Hours
- 16-20 Hours
- 21-25 Hours
- 26-30 Hours
- More than 30 Hours

About how many hours do you spend in a typical 7-day week working for pay off campus?

- 0 Hours per week
- 1-5 Hours
- 6-10 Hours
- 11-15 Hours

- 16-20 Hours
- 21-25 Hours
- 26-30 Hours
- More than 30 Hours

During your sophomore year, did you consider health/nutrition when you bought food at the grocery store?

- Yes
- No

At any point in your sophomore year, did you teach cooking skills or share recipes with others?

- Yes
- No

Rate your level of agreement with the following statement: During my sophomore year, I felt confident about initiating conversations and making new friends.

- Strongly agree
- Somewhat agree
- Neither agree nor disagree
- Somewhat disagree
- Strongly disagree

How often during your sophomore year did you eat food you cooked yourself?

- All or most of the time
- Several times per week
- Around once per week
- Once every several weeks

- Once per month or less

Figure A.1: Student Wellbeing Survey.