The Distance Between Them; The Economic Geography of Students in Wisconsin

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Abstract

Urban economics is an extensive field with innumerable externalities that affect consumer spending. College communities create dynamic seasonal changes in demands and varying populations, offering a unique opportunity for field study. Urban economics is a broad theory, so we formulate a tailored approach to the relationship between students and the restaurant industry. As we expand on previous economic impact studies, we conduct survey analysis to determine Madison student’s restaurant preferences and their geographic residences. We analyze the distances between Madison student’s residences and restaurants to show the importance of geographic location. In addition to surveying, we gather secondary information from multiple sources to help us recognize larger consumption and population patterns. On a macro scale, we compare the ratio of student population to the whole in college communities and non-college communities across Wisconsin and other neighboring states to measure how student’s demands impact the restaurant industries. We believe the student population dynamic within local economies is an understudied series of networks and through our research we hope to spur further thought on how to conceptualize the motives behind student’s consumption of restaurants.

Research Questions

How do students impact the restaurant industry in Madison? Does location matter and why? Do students affect the number or composition of restaurants?
Introduction

Madison is a vibrant city consisting of 250,000 people, with an additional 50,000 students during the school year. The economic nucleus is extremely diverse and the students of the university play an influential role in the well-being of the local economy. In the past researchers have looked at the economic impact of universities by looking at employment, university spending, government spending, taxes and other variables. We want to launch from this previous area of study to take a closer look at student’s economic impact in Madison and other college communities alike. In terms of economic impact, we will focus on student’s impact on local restaurants. We believe that restaurants are a viable and measurable benchmark to track student’s attitudes, tastes, preferences and spending habits to draw larger conclusions about economic impact. In order to comprehend the economic impact of students within city, we will tailor an underlying theoretical knowledge of urban geography, which focuses on the understanding of the distribution patterns of places, the distinctive nature of the places, as well as the regularities that exist among them in terms of spatial relationships between people and their environment (Amoah, 2001, 16). We prove that students impact the restaurant industry in Madison through investigating distance decay theory, student’s tastes and preferences, and central place theory. We argue that distance decay theory will hold and that the closer a restaurant is to residences, students will visit it more frequently. Additionally, we argue that students are willing to travel further to specialty restaurants. From survey results, we argue that college communities have a different composition of restaurants than non-college communities because of student’s restaurant demands. In viewing the University as a ‘central place’, we
explore the capacity of Madison’s economy. Lastly, we argue that central place theory does not hold and college communities do not necessarily support a larger number of restaurants per capital as compared with other, non-college communities. We use maps, graphs and other data analysis to display the results of our surveying and research. Overall, our surveying and research defines students’ consumption patterns as related to restaurants to develop a model for student’s economic impact in Madison.

Literature Review

Economic Impact

The most common way that the economics of students, and their respective universities, have been examined is through economic impact studies. Across the country universities have conducted these studies, particularly public institutions, as they vie for state funding and try to prove their value. Within this context, economic impact studies attempt to, “measure the increase in a region's economic activity attributable to the presence of the college or university” (Elliott, Levin, and Meisel 1988, 17). Kinnick and Walleri (1987, 70) identify four of the advantages of conducting an economic impact study: First, inform the public that higher education does not operate in a financial vacuum. Second, demonstrate that higher education makes a positive contribution to the respective surrounding economy. Third, make business leaders aware of the value of higher education in regards to their own financial gains. Lastly, influence voters and legislators to continue their support. The vast number of these studies validates the relevance of our project, and shows academia’s interest in university students’ spending.

Impact studies take in a wide variety of data, and according to a Vanderbilt review of economic impact studies, can include: direct employment and payroll, federal taxes, supplies and services cost, among others. This study concluded, “the nature of the fundamental mission of
colleges compels them to apply high standards of transparency and accuracy in studying themselves” (Siegfried 2006, 1). Universities engage in competition with other state ventures and continue to justify their existence and impact in a dollar amount; however as the institutions are often conducting or paying for the studies themselves, there are valid arguments that the data could be skewed in the favor of the schools (Siegfried 2006, 1).

As we are focusing more on the impact of students, not the University of Wisconsin Madison as a whole, it helps to compare other studies that looked at student spending isolated from the entire institution. The paper “The Economic Impact of Dickinson College on Carlisle and Cumberland County,” Schachter and Bellinger (2006, 28) examines the impact of Dickinson College students on the greater Carlisle area in Pennsylvania. They gather their data by emailing the entire student body during the Spring 2010 semester, and achieved a 30% response rate. Schacter and Bellinger then explain how they used different impact multipliers\(^1\) to calculate the total student impact as a result of the responses from the surveys. The economic impact studies and their multiplier levels do not directly pertain to our research, but instead we are interested in the data collection that lead to the specific impact multipliers; whether it is in Carlisle, Madison, or any town in America.

NorthStar Economics conducted two recent studies on UW-Madison economic impact, which we will use to help draw our own conclusions: “University of Wisconsin-Madison’s Economic Contribution to the Region” in 2003 and “The University of Wisconsin-Madison’s $12.4 Billion Impact on the Wisconsin Economy” in 2011. The 2003 study has a chapter with the title “The UW-Madison Students Contribution,” which focuses on students and explains the

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\(^1\) The NorthStar (2003) study defines a multiplier as “the recurrent economic activity generated by an initial expenditure”(p12). It uses the example of spending $100 on a construction project will cycle through the economy as wages, money spent on materials such as concrete or shingles. If construction has a multiplier of 2.9, then that $100 in direct spending results in a total of $290 added to the economy through the multiple cycles.
methodology behind their study of students’ economic impact. NorthStar (2003, 44) conducted a survey via mail, where they sent out 600 letters to random students and received 240 usable responses. NorthStar (2003, 46) also concluded that their survey numbers regarding student spending were 16% higher than the numbers the University of Wisconsin publishes in their financial planning guidebook that applicants and freshman receive each year, which is the same as the national trend at other institutions. We will draw on the research of NorthStar, and conduct our own survey as we look at the spending patterns of students in relation to restaurants in a way that has not been done before.

The 2011 study claims that student spending is responsible for 13.6% of UW-Madison’s total impact on Wisconsin, with the other components being the institution, employees and visitors. Economic impact studies often declare a number of jobs created by the institutions and the 2011 publication was no exception. It claims that direct student spending alone is responsible for 13,470 jobs and the entire UW-Madison including the hospital creates 97,357 jobs that would not be in the state of Wisconsin if not for the University (NorthStar 2011, 7). It is clear students have an immense impact on the region, and we hope to understand the geography behind their direct spending, specifically pertaining to the restaurant industry.

Each of the studies presented above contribute to our project in one way or another, whether theory or methodology. The fact that there are numerous studies on the economic impact of universities and their students validates the importance of our project and its relevance in academia. It is important to draw from other college and city specific studies to understand how they conducted such studies, and then compare these other places to Madison. We will then take the results of our surveys and apply multiple geographic data models in an attempt to prove
that the student purchasing power in Madison results in the ability to support a greater number of restaurants than cities without student populations.

**Distance Decay**

In accordance with Waldo Tobler’s (1970, 276) First Law of Geography, “All things are related, but near things are more related than far things,” the theory of distance decay postulates that as distance between two objects increases, the interaction between them will decline. When examining student restaurant preferences, therefore, it is believed that the further away a restaurant is from a student’s home, place of work, or school, the less likely it is that it will be frequented.

People do not want to go out of their way for something that is not the most anticipated option, therefore making distance a very important factor. In his research of social movements, Peter Taylor (1975, 12) states “Interaction and distance is one of the most fundamental relationships in theoretical geography.” Distance is not a dynamic process variable but remains a simple structural characteristic of any situation. We would like to develop this statement by showing how there is a correlation of restaurants visited by students in relation to the distance between restaurants and student housing.

Distance decay has recently been used in large-scale studies to discuss the advance in technology and communication through a global scale lens. We consider this geographic theory and apply it in local terms to analyze student’s spatial interactions with restaurants. We want to see how distance decay affects various categories of restaurants in different ways. We will to compare student’s ‘favorite,’ ‘most visited,’ and ‘delivery’ restaurant choices. We will analyze
the various distance traveled by students to eat different categories of cuisine such as ‘Asian’ or ‘Mexican.’

Central Place Theory

Central place theory focuses on explaining the number, size and locations of human settlements in an urban system. In terms of students affecting the number of restaurants in a city, there must be a certain threshold population, which is the minimum population size of an urban center for the support of an urban function. (Caruthers 1981, 248) Central place argues that higher populated areas will provide a greater amount of goods and services. On a micro level, it is favorable for restaurants to be congregated near each other, even if they are direct competitors.

In a study investigating the significance of hardware store locations, Litz and Rajaguru (2008, 483) proposed the question, ‘Does small store location matter?’ In their analysis the authors focus on the relative proximity to other sources of the same product or service. Using Dillman's Total Design Technique (1978), the authors identify the following independent variables: customer density, product mix and service mix and competitor density. The authors found that small retailers' performance prospects were significantly enhanced when they operated in more densely populated areas with longer hours of operation. One might ask whether the same is true for food establishments in the city of Madison, WI. Though there is more competition on State Street, the area is heavily trafficked and densely populated. We will consider whether the stores on States Street will get more business – despite the competition with other venues – than a free-standing restaurant across town, even when that restaurant may be the only option for passerby?
On the macro level, we will use this theory to compare the amount of students and restaurants in Madison to other cities in the Midwest. We will analyze whether the central place theory will hold in regards to college communities, in that they will support more restaurants than non-college communities. We will use this theory to test if cities with larger percentages of college students can support a larger amount of restaurants compared to cities with smaller student populations.

Methodology

The aim of our research project is to gather information about how different factors affect the number and composition of restaurants in Madison. In order to address our three claims, we employ several methods of data gathering. It is essential to gather primary data because no other studies conducted in the past pose our same research questions. There is no way to solely compile secondary data to test the distance decay theory as relates to students and restaurants in Madison, nor draw conclusions about student’s tastes and preferences. To gather primary data we use surveying, as used by other impact studies. Secondary data plays an important role when we test the central place theory; to compare ratios of student populations to the whole population as relates to the number of restaurants. This type of secondary data is readily available and very useful to identify the affect of student populations on the restaurant industry across many different cities. The primary and secondary data we gather is used to generate maps, graphs and charts to evaluate the relationships between students and restaurants in Madison.

As stated in Research Methods in Geography, “A survey can answer questions about the distribution of characteristics (that is, measurable attributes) within a population and across particular sites (such as different urban neighborhoods) or population subgroups (such as women, ethnic minorities, or young people) (Secor 2010, 196).” We employ surveying in order
to accurately measure student’s consumption patterns as it specifically relates to distance and
tastes and preferences. Our research questions lend themselves to both descriptive and
inferential statistical analysis and surveying allows us to gather the significant, valid and reliable
information we need. While other methods of data gathering, such as interviews, could
potentially refine our results, we only focus on the survey tool for primary data collection.

Our sampling procedures and survey questions determine how reliable, relevant and valid
our data is. In order to draw significant conclusions, we pursue survey methods that ensure a
large sample size and high response rates. To ensure a large sample size, we gather as many
surveys as possible over a month period. In addition, we utilize a number of approaches to
distribute our survey. To ensure a high response rate, we limit the length of our survey to under
three minutes to complete. First, we pass out surveys in University of Wisconsin-Madison
classes with both undergraduate and graduate students. This method is successful in reaching a
large population of students but limits the number of freshman and sophomore responses. To
balance the ages of respondents we employ face-to-face surveying. We pass out surveys at
twelve locations around and near to the UW-Madison campus. Some locations include the
capital square on Butler Street, Monona Terrace on Regent Street, Camp Randall on Lathrop
Street, and Memorial Union on Langdon Street. It is challenging to find a large amount of
respondents with this method of surveying because people do not want to be stopped on the
street. Fortunately, we improved the diversity of our sample by including students of a variety of
ages that live in many different places.

The last method of surveying we use is quiksurveys.com. We share the survey via
Facebook with the UW-Wisconsin network of students. This method of surveying is successful
in reaching large numbers of students because it is the most quick and convenient way for most
respondents. One bias we see with this method is that mostly junior and senior students are exposed to the link on Facebook because they are more closely associated with our group members. Correspondingly, the majority of respondents live in the Langdon Street area. While, we achieve high response rates, the data set is much skewed. In conclusion, we are able to achieve a large sample and high response rates with our surveying methods and able to collect over 200 responses that represent every age and area on campus. Figure A1 is a geographic representation of our entire survey respondent’s resident locations.

Our survey begins by asking where students live in order to generate a general idea of our survey respondents and the distances they travel to restaurants and other places. We continue to ask questions that target student’s tastes and preferences such as: “what are your three favorite restaurants,” “what are your three most visited restaurants,” and “what three most used delivery restaurants.” Additionally, we use Likert scale questions to gather more specific information on student’s restaurant choices. A full version of our survey is displayed in the appendix. Our survey questions allow us to gather both qualitative and quantitative data to make inferences about the strength of distance decay theory, central place theory and student’s tastes and preferences.

Beyond surveying, we need secondary data to test central place theory, which focuses on explaining the number, size and locations of human settlements in an urban system. We focus on two types of cities: college communities and non-college communities. We are comparing the number of restaurants to the total population of the city, and to the student population both as a number and as a percentage in each given city. The first step in gathering our information is to determine the different towns we will examine and compare. To start, we select all of the four-year college programs in the UW system. To increase our sample size, we select other
universities from neighboring states, specifically those in the BIG TEN with similar city and student body characteristics. To measure the impact of students in these college communities, we need to compare them to non-college communities. We select other towns in Wisconsin and neighboring states without a four-year college program, or with a marginal student population less than 15% of the total population.

To obtain the most recent population data we use the fact finder that the U.S. Census has on their website\(^2\). From there we enter each of our given towns and use the ‘total population,’ number in the ‘ACS Demographic Estimates,’ category. To calculate the student population we used collegeboard.com and add up the population of the two largest universities in each place. In addition, most colleges have a ‘total undergrads,’ and ‘graduate enrollment,’ statistics, which we combine to determine the total student population. For example, we choose towns that have a predominate university, such as UW Madison, in Madison, Wisconsin, and then also factor in the secondary school, MATC to gauge the student population, even if there are some other small schools in the area. We realize many of these places have more than two colleges, but we try to pick cities where the third school’s student body is small enough that its contribution is essentially inconsequential to our results. Now that we have established all of the cities, their total and student population, we analyze the restaurants in each place.

To determine the popular restaurant categories with college students we use the results from our surveys, and we assume the categories are popular across all college communities. From our survey results, we organize our data into YellowPages pre-determined categories. The four most common categories are ‘Pizza,’ ‘Sandwich Shop,’ ‘Chinese,’ and ‘Mexican.’ In addition, we change ‘Chinese’ to ‘Asian’ to be more inclusive, and add ‘Pasta,’ ‘Ethnic,’ ‘Bar,’

\(^2\)http://factfinder.census.gov/home/saff/main.html?_lang=en
and ‘Other’ categories. We gather data on the number of restaurants in each category for each of the college communities and non-college communities with the help of YP.com. Along with the number of restaurants in each category, we gather information on the total number of restaurants. In order to quantify it we multiplied the total number of restaurants in our eight categories by the student population in each town, and then divide that number by the total population of each college community. The process to calculate distance decay is solely based on Madison students and their restaurant selections from surveys. We determine the distances to ‘favorite,’ ‘most visited’ and ‘delivery’ restaurants by using their home residence as the starting point. To gather information on restaurant addresses and distances from residences, we use Google Maps. This information is crucial to generate maps and graphs that display the geographic distribution of students and the restaurants they visit.

Data Results and Interpretation

Distance Decay

Through our data analysis, we conclude that the distance decay theory holds as it relates to students and their consumption patterns of restaurants. First, we claim that the closer a restaurant is to a student’s residence, the more frequently they will visit it. UW-Madison Students Most Visited Restaurants (Figure A2 in appendix) and Most Visited Restaurants-Average Distance Traveled (Figure A3) and All Restaurants Average Distance Traveled (Figure A4) display this correlation between distance and consumption. Second, we claim that students are willing to travel further to their ‘favorite’ restaurants (Figure A5 and A6). Overwhelmingly, respondent’s ‘favorite’ restaurants are classified as specialty or non-franchise restaurants. We can infer that students are willing to travel further for a unique or higher quality dining
experience, compared to easily accessible franchise restaurants. We cannot conclude any clear pattern of student’s effect on the number or composition of ‘delivery’ restaurants (Figure A7).

MAPS

To help interpret the results we generated two different types of maps to display our claim that distance decay theory holds. The first type of map shows each restaurant’s location with a circle, whose size is contingent upon the number of written responses on the surveys. The second type of map has circles that represent each restaurant by the average distance student’s travel to each location. Here the size of the circles on the map is correlated not to the number of responses, but average distance from student’s home to the establishment.

Total Distance Decay

Figure A4 shows all of the restaurants with each location represented by a circle of varying sizes corresponding to the average distance student’s travel to get there. Students must travel greater distances to get to these restaurants, as this is shown by the size of the circle. Most restaurants are concentrated around State Street but it is evident that students are willing to travel further to select restaurants.

‘Most Visited’ Restaurants

Figure A2 displays the ‘most visited’ restaurants is much more concentrated than the map that displays ‘favorite’ restaurants. Almost all of the ‘most visited’ restaurants are on State Street or very close to campus. There were only 96 different restaurants listed as survey responses, which is significantly less than the number of ‘favorite’ restaurants. The responses were more concentrated within fewer responses, as the top ten restaurants accounted for 54% of the responses, compared to just 35% with the top ten of ‘favorite’ restaurant responses. This is shown by the fact that a large number of the restaurants are displayed with bigger circles.
‘Most Visited’ Distance Decay

Figure A3 is similar to the ‘most visited’ by response rate, except the size of the circle reflects the distance traveled and not number of responses. The same inferences can be made as explained in the section above. In addition, the circles are generally smaller sizes, showing how much of a factor distance is for a routine meal. While, students may travel a variety of distances for different meals, they regularly choose to travel shorter distances to their ‘most visited’ restaurants.

Favorite Response Rate

Figure A5 shows ‘favorite’ restaurants are the most diverse of the three types of restaurants. There were 144 different responses, which is roughly fifty more than the next closest category, ‘most visited.’ The responses are much less concentrated than the other two maps, as shown by a smaller number of larger circles. In addition to a variety of responses, the geographic distribution of the restaurants varies more than the other two maps. Similar to the other two maps there is a large concentration of restaurants close to campus on State Street, but in contrast a significant portion of the restaurants are further away from campus. This map shows that people are willing to travel farther to reach their favorite place to eat.

‘Favorite’ Distance Decay

Compared to maps that display average distance traveled by students, Figure A6 makes supports that students are traveling farthest to reach their ‘favorite’ restaurants. The high number of large circles further from campus illustrates this claim. There is a high concentration around State Street, but the general distribution of restaurants across Madison display the trend that students will travel farther to get to their ‘favorite’ restaurants.

Most Visited ‘Delivery’ Distance Decay
Our data analysis does not support any strong claims about ‘delivery’ restaurants. We are only able to note a few observations that could only potentially display student’s impacts on ‘delivery’ restaurants. First, Figure A7 has the least number of establishments, as there is a smaller number of places that deliver in Madison. There is still a loose concentration of restaurants on State Street that reflects the high number of restaurants located there, delivery or not. By nature as ‘delivery’ restaurants, distance is clearly going to have less of a factor, as shown by the larger circles across the map. Additionally, it is difficult to distinguish between ‘delivery’ and ‘carry out’ restaurants, as people might choose to walk to a closer ‘carry out’ restaurant, compared to ordering ‘delivery’ from a restaurant located further away.

**Tastes and Preferences**

Through our analysis we conclude that college communities have a different composition of restaurants than non-college communities.

**‘Delivery’**

Presented in the graph B1, over 75% of survey responses were ‘Sandwich’, ‘Asian’ and ‘Pizza’ restaurants; showing that these categories were more likely to have ‘carry out’ options that are easily accessible, cheap and convenient for students. The specialty restaurants categorized in “other” may not have ‘carry out’ or ‘delivery’ options, making the decision to visit these restaurants more frequently impractical. By referring to Figure A7, it shows students are more willing to purchase from a ‘delivery’ restaurants because distance is less of a factor. Students do not actually travel to get their food; therefore price and convenience will have a larger impact on their decision to choose one restaurant over another.

**‘Favorite’**
Figure B2 displays that there is diversity with student’s favorite restaurants. The ‘other’ category is the largest, which consists of all restaurants that do not specifically fall into one of the seven predefined categories, therefore showing the overall diversity in student’s ‘favorite restaurants.’ We claim that for student’s ‘favorite’ restaurants, taste and quality contribute the most to decision making as our results show very little variety in prices. Although Chipotle had the most responses for ‘favorite’ restaurants, it’s category of cuisine, Mexican, wasn’t even in the top three favorite types of cuisine.

**Most Visited**

Price and convenience are the most important factors in determining ‘most visited’ restaurants. Overwhelmingly, ‘sandwich’ restaurants had the highest survey response rate for ‘most visited’ as shown in Figure B3. From this, we can claim that students prioritize price and location. After comparing prices, ‘Sandwich’ restaurants are consistently the cheapest category, Figure 8 shows that people don’t travel very far to reach the restaurant as shown by the large influence of distance by the small circles in Figure A8 representing the large influence of distance.

**Central Place**

To test central place theory, we graphically display in Figure D1 a regression model which shows the relationship between the total populations to total number of restaurants in different cities. In this graphic representation of central place theory, the total number of restaurants is on the x-axis and the total population is on the y-axis. College communities are qualitatively represented by varying color hues based on the percentage of student population in terms of total population. The darkest shade of red represents a student percentage of 45% or more of total population. In the progression down the color variance, the lighter shades of red
represent a smaller percentage of student population in terms of total population. Non-college communities are represented in a neutral blue color. If central place theory held, the points above the line would encompass the darkest red dots while the lighter shades of red and blue dots would reside on or below the line. In this regression, the important factor would not be the strength of $R^2$, but instead the consistent pattern of distance from the point to the line. The number $R^2$ ranges from -1 to 1, as a number closer to 1 represents an even increase in one variable in relation to the other variable. When $R^2$ is zero, there is no correlation between the variables, and a negative correlation shows an increase in one variable leads to a decrease in the other. The $R^2$ will show the correlation between the total population and restaurants; however we will focus on the residual error of distance from the point of the line to support the student impact on restaurants in cities.

However, our data does not support central place theory in regards to student population and quantity of restaurants. The residual variation of distance from the line increases with total population, but there is not a consistent pattern of darker red dots above the line. This regression shows a positive correlation between size and restaurants, and that students have some impact. Yet, the large residuals for both college communities and non-college communities suggest that other factors are more important in determining the outcome of the regression model. A problem with this particular regression may have to do with the fact that not all restaurants in the city advertise in the yellow pages.

Even though the relationship is weak, this does not necessarily disprove that student’s impact the number of restaurants, as there could be various exterior impacts that we did not consider. When we run the regression and compare the $R^2$ of all eight types of restaurants, we see there are some weak correlations, and some even weaker. For example, the total restaurants
had an $R^2 = .41$, Pizza $R^2 = .30$, Sandwich $R^2 = .41$, Mexican $R^2 = .46$ Asian $R^2 = .46$. This suggests students slightly impact the restaurant industry, however suggests that other factors are more important for the regression model. We suggest that students do have an economic impact on the local economy, but not necessarily in regards to restaurants, but other goods or services industries.

One interesting pattern we found in our data is that there are a slightly higher percentage of ‘sandwich’ restaurant demanded in college communities compared to non-college communities. In our primary data, ‘sandwich’ restaurants are the most visited restaurants by category. As ‘sandwich’ restaurants are the most popular, we want to explore this pattern through other mediums. We compare the ‘sandwich’ category to the other categories of restaurants in Madison, and test if this trend holds across all college communities compared to non-college communities. When we ran the regression with the total number of ‘sandwich’ restaurants in regards to total population and compared to other categories of restaurants, we find that there is a higher percentage of sandwich shops in college communities than non-college communities. In college communities like Madison, we suggest that there are more sandwich shops because students prioritize price and convenience. We conclude that our survey data does in fact correlate with the number of sandwich shops in the other college communities we selected, so we explore this trend further by creating a distance decay map of ‘most visited’ ‘sandwich’ restaurants.

The map shows that relative to other categories of restaurants, on average students travel shorter distances to ‘sandwich’ restaurants. While ‘sandwich’ restaurants can be generic in nature, distance is a more important factor than price, variety or quality. Due to the fact that the distance decay map for ‘sandwich’ restaurants corresponds to our central place regression model
and ‘most visited’ restaurant, we believe that ‘sandwich’ restaurants are very unique in nature. We think some of the characteristics of sandwich shops should be examined more extensively to understand why our three different models all correlate with one another. We would like to look into this further by continuing to compare the distance decay of each type of restaurant with the ratio of the number of establishments supported in college communities’ in comparison to non-college communities.

**Limitations**

Throughout the semester we had to continuously refine our research in order to effectively complete a project within the given time frame. However, we discussed numerous future research possibilities to further the understanding of the underlying logistical patterns of student’s spending habits in Madison. We are aware of the limitations of the survey method of our data. Due to the lack of time to survey, we were unable to obtain an extremely diverse set of responses. Our survey was ineffective towards students because they did not want to reveal where they live or did not fill out the entire survey. This in turn inhibited our ability to formulate data by failure to connect distance and restaurant choices for many students.

**Discussion**

*Central Place*

Considering the eight categories of restaurants we observed, it could be interesting to analyze specific restaurant trends in college communities versus non-college communities. For instance, one could compare the differences in total revenues of the most popular restaurants in college communities and non-college communities. While students might not affect the total number of restaurants, they might generate higher revenues for certain types of restaurants in college communities versus no-college communities, and vice versa.
Restaurants

Our survey results show the geographic location of some restaurants such as Chipotle, Potbelly’s and Five Guys were of the most commonly mentioned destinations on State Street. If we wanted to take the qualitative data approach from another perspective, we could interview workers at restaurants, as well as contact managers, to obtain better foresight on what their approach is in regards to attracting student business. Just as it is important to comprehend the student-restaurant interaction, the restaurant-student interaction may provide very valuable insights. This information could help restaurants improve their business campaigns and target various segments of the student population.

Neighborhood Effects

We hypothesize that neighborhood effects could be a very important factor in how students determine where to eat. Patricia Melvin (1986: 360) describes “neighborhood effects” as the theory that cohesive neighborhoods tend to have similar tendencies in terms of education, eating habits, voting patterns, friends, et cetera. On the back of our survey we asked students to identify their neighborhood on a map to get a general idea of how students perceived their neighborhoods. We found that student described their neighborhood by 2-3 block parameters. Often times we noticed students labeled Camp Randall or the Kohl Center as landmarks that they lived close to.

Neighborhoods depend on a number of factors including geographic sites, ethnic make-up or generic stereotypes. The different descriptions of a neighborhood are important to fully understand the complex urban economy in both qualitative and quantitative ways. We believe that there are many interpretations and perceptions about space, place and neighborhoods that may influence student’s consumption behavior. There may be a possibility that if someone was
able to identify particular features of people in each neighborhood, it would provide a much more effective means to identify and categorize broad consumer patterns. This could help to better understand if student’s eating patterns are affected by where they live and the social norms that influence their daily lives. However we acknowledge that the student population shifts every year. The preference of one neighborhood might be different for one year to the next. On the contrary, if done over a span of 10 years, we could see that in fact certain socio-economic demographics of people tend to live in certain areas and tend to have similar eating patterns.

Another idea to consider is varying levels of disposable income among students. Students with less disposable income may choose to eat in, or to utilize campus housing meal plans or dining halls. Many housing and university meal plans offer special deals for certain restaurants and this may affect student spending in regards to restaurant choice. A comparison of individual case studies between different housing settlements would provide interesting data on how housing meal plans or building demographics affect student’s consumption patterns.

Shown through our research, there is a positive impact of student spending in college communities. We think that similar studies employed on different sectors of the food industry, such as grocery stores and bars, as well as other industries, may show more prominent student impacts.

*Distance Decay*

One factor to consider between the distance and price is the variation of distance traveled in regards to money spent. We believe that if a student is committed to spending a larger sum of money on a meal, they will be less reluctant to spend more travel time to get there. Whereas if a student is only going to spend $5 dollars on a meal, then we assume that the distance traveled would be much less, as there little value attained from traveling further. The comparison of price
to distance in regards to consumer preferences would offer interesting insight into variance between different restaurant categories.

Another indirect factor to consider that affects student’s consumption patterns is transportation networks. A geographic analysis of student’s access and use of transportation networks would help answer questions such as how travel costs and time affects student’s consumption patterns of restaurants and other businesses. If distance decay increases for some neighborhoods due to lack of bus routes, bike paths or sheer distance, this can help businesses’ with their marketing and promotional strategies for their various customers. If it is a huge factor, how can businesses’ overcome the distance in terms of money and time to promote more student demand?

Conclusion

The foundation of our research project lies in the understanding of student’s impact on college communities’ economies. Launching from previous impact studies, we sought out to answer how students impact the restaurant industry in Madison and what drives student’s consumption patterns. Through surveying over 200 students across campus and collecting detailed secondary data, we tested distance decay theory, central place theory and analyzed student’s tastes and preferences. Our data findings support the distance decay theory and we found that price and location are the two driving factors behind student’s tastes and preferences. Our research does not support central place theory, as we did not find that college communities support a larger number of restaurants than non-college communities. In conclusion, we suggest that students impact the type and composition of restaurants, but not the overall quantity of restaurants. Our project only scratches the surface in understanding the economic geography of
students and we believe that there are many other significant factors that could be further analyzed.
Bibliography


Appendix

Maps

A1: Student Housing Distribution
A2: Most Visited Restaurants – Response Rate
A3: Most Visited Restaurants – Average Distance Traveled
A4: All Restaurants – Average Distance Traveled
A5: Favorite Restaurants – Response Rate
A6: Favorite Restaurants – Average Distance Traveled
A7: Delivery – Average Distance Traveled
A8: Sandwich Shops – Average Distance Traveled

Pie Charts

B1: Delivery Restaurants by Category
B2: Favorite Restaurants by Category
B3: Most Visited Restaurants by Category

Distance Decay Graphs

C1: Total Distance Decay by Preference

Regression Models

D1: Central Place: Total Restaurants
D2: Central Place: Sandwich Shops

Survey
Figure A5
B1

Most Visited Sandwich Restaurants - Average Distance Traveled

Legend
Sandwich Restaurant
Average Distance Traveled
- 0 - 0.25
- 0.251 - 0.5
- 0.51 - 0.8
- 0.81 - 1.5
- 1.51 - 2.4
- 2.41 - 3.7
- 3.71 - 5.5
- 5.51 - 11.7

Student Response: Most Utilized Delivery & Take-Out by Category

- Sandwich/Deli: 28%
- Pizza: 27%
- Bar: 10%
- Other: 4%
- Mexican: 1%
- Ethnic: 2%
- Pasta: 28%
Figure B2

Student Response: Favorite Restaurants by Category

- Bar: 16%
- Other: 21%
- Pizza: 9%
- Asian: 13%
- Sandwich/Deli: 11%
- Mexican: 12%
- Ethnic: 8%
- Pasta: 10%

Figure B3

Student Response: Most Visited by Category

- Sandwich/Deli: 28%
- Mexican: 20%
- Ethnic: 4%
- Pasta: 7%
- Bar: 9%
- Asian (Not Sushi): 8%
- Pizza: 12%
- Other: 12%
Figure D2

Central Place

$R^2 = 0.4066$

Central Place for Sandwiches

$R^2 = 0.4141$
The Distance Between Them

This survey has been created by students in Geography 565 as part of their capstone project. We will not collect, or otherwise obtain, any personal identifying information about you, unless you wish us to do so. Your responses are 100% confidential and will only be shared among the research group members and their professor. Thank you!

1. Gender: M  F
2. Year in School:
   1  2  3  4  5  Grad  Other:
3. What block do you live on (ex. 400 block of State St.)? (OPTIONAL):

4. Do you consider your residence to be on campus? YES  NO
5. How important is it to you (5 = very important) to live within walking distance of restaurants or grocery stores?
   Restaurants  1  2  3  4  5
   Grocery Stores  1  2  3  4  5

6. How often do you typically eat at off campus restaurants PER WEEK?
   Never  1-2  3-4  5-6  7-8  8+

7. How much do you typically pay for food (including beverage and tip) at each meal?
   $ 0-2.50 $2.51-5.00 $5.01-$7.50 $7.51-$10.00 $10.00+

8. Rank the following (5 = most important) in terms of their importance when choosing a place to eat:
   Price  1  2  3  4  5
   Variety  1  2  3  4  5
   Food Quality  1  2  3  4  5
   Location  1  2  3  4  5
   Service  1  2  3  4  5

For questions 9 through 11, please provide a street name, if possible, for restaurants with more than one location.

9. What are your three favorite restaurants in Madison? (No order)
   ____________________________, ____________________________,
   ____________________________
10. What are your three most frequented restaurants in Madison?
   ___________________________, _________________________________,
   __________________________________

11. What are your three most frequented carryout/ delivery places in Madison?
   ____________, _________________________________,
   __________________

12. What mode of transportation do you use most often to get to off campus restaurants?
   Walk    Bike    Car    Public Transit    Moped    Other

Please indicate on the attached map where you believe the boundaries of your neighborhood to be. For example feel free to circle your neighborhood boundaries or specify significant landmarks.

Thank you for your participation!                                  (OVER)