

Customer Distribution of Selected Terre Haute, Indiana Shopping Centers

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Introduction

Numerous research projects have been undertaken with the purpose of investigating customer distribution and travel behavior. Relationships in distance traveled, desirability of goods, and many other variables, have been taken into consideration. New research into the problems of customer behavior involves a unique combination of independent variables or new methods of obtaining the necessary data. The analysis of data obtained from the method is a complex relationship of many variables and is not of primary concern within the scope of this research.

The Problem

In a study concerning customer distributions, the problem involves conceptions, trade routes, thresholds, and a multitude of other interrelated questions. The data must always be analyzed with these things in mind. But first, the data must be obtained as effectively as possible.

Hypothesis

It is the hypothesis of this research study that it is possible to sample customer origin without the use of questionnaires or interviews in order to determine the distribution of customer origin as related to specific shopping centers. Furthermore, the data obtained from such a method has the potential to be utilized to make inferences concerning variables that could effect the distribution of customers to various shopping centers.

Method

The technique of observation has been defined as the actual physical process by which the information is gathered. The choices of these techniques are classified as 1) self-surveys, 2) interviews, and 3) direct inspection (6). The system used in this study is direct field inspection. Bias and Cost are the two criteria that must be considered in the choice of techniques of observation. These two criteria are often interrelated and a balance should be made between the two.

On this basis, Indiana is an opportune state for direct field inspection required in a study such as this one. Each community within the state is assigned a prefix of specific automobile license plate numbers that are unique in their community. Therefore, the origin of motor vehicles on the parking lot of a shopping center is easily determined from the license plate number. This method of data collection immediately eliminates one of the two criteria for choice of

techniques of observation, by holding down excessive costs that are associated with interviews and questionnaires. The other criteria, which is bias, can be diminished greatly by the sampling model.

In order to demonstrate this method of investigation, the method is applied to the shopping centers in Terre Haute, Indiana. These shopping centers are selected on the basis of size and location within Terre Haute. They all provide a diversity of goods and are all located at extreme distances from each other within the city limits of Terre Haute.

The first shopping center is located at the southern city limits and is known as Honeycreek Mall. It includes numerous stores of various sizes and specialties, ranging from large department stores (Sears and Meis) to smaller specialty shops (leather goods, tobacco, etc.)

North Plaza shopping center is also selected primarily due to its location on the north urban fringe. North Plaza, like Honeycreek Mall, includes department stores, specialty shops, a movie theatre, and eating establishments. Since the Wabash River bounds Terre Haute on the west, and no other shopping centers are located on this side, the final shopping center is selected in the eastern part of Terre Haute. K-Mart Plaza, like the other two selections, exhibit smaller specialty stores as well as a large (discount) department store and a dining establishment.

The sampling model that is used is designed especially for this situation in order to eliminate as many sampling biases as possible. This model is an attempt to obtain a systematic sample, in an unbiased fashion, that represents the actual behavior of the people in the area. It is best described as a systematic sampling model because it was designed to take an ordered sample in set intervals.

The sampling model itself consists basically of the same format for each shopping center (Fig. 1). All license plate numbers are obtained while the cars are parked. Each parking lot is divided into six or seven equal sections and these

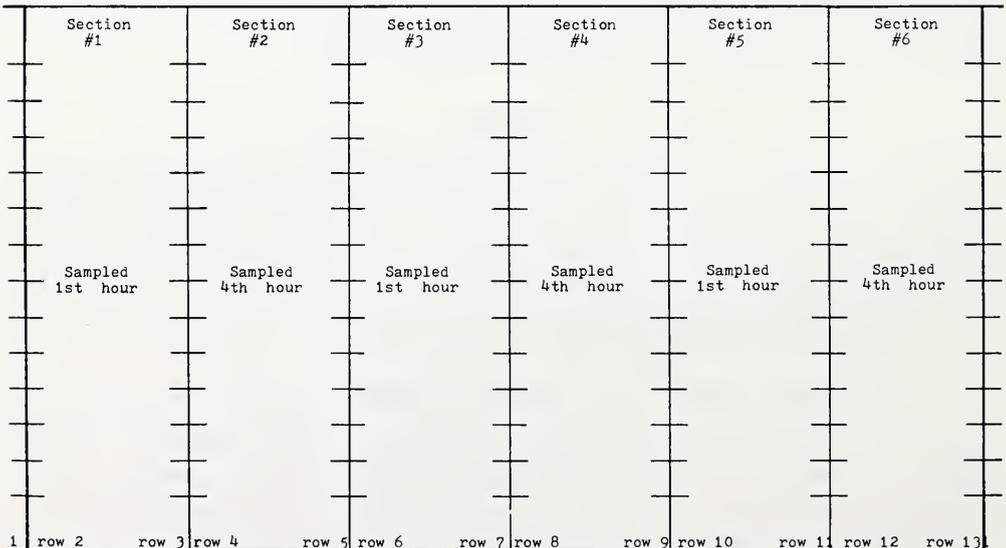


FIGURE 1. Example of Parking Lot Sampling Model

sections are charted and labeled. Each section consists of an equal number of rows of cars. Cars were selected from rows in each section. Every third and fourth car is selected in every row so that each section ended up with an equal amount of license numbers.

The purpose for gathering information by sections is to inable the license numbers to be easily recorded at different times during the day without an overlap. Odd numbered sections are investigated at the same hour, whereas, even numbered sections, in the same shopping center, are investigated three hours later. For example, sections one, three, and five in Honeycreek Mall are sampled at one o'clock on a given day. Sections one, three, and five are sampled at North Plaza one hour later at two o'clock. Sections one, three, and five are finally sampled at K-Mart Plaza at three o'clock, and K-Mart Plaza at six o'clock. When the day is over, a total of one hundred license numbers per shopping center are recorded, covering two different times during the day for each center.

The starting order of the sequence of shopping centers is also rotated by week. The one o'clock samplings start at Honeycreek Mall the first week, North Plaza the second week, and K-Mart Plaza the last week. This rotation makes sure that one shopping center is not always sampled at the same two times during the day. The exact parking spaces sampled within each row of a section are also rotated to avoid possible overlap.

All of this careful rotation is planned for the purpose of eliminating as much bias as possible in the sampling. Different times of the day are incorporated in the sampling to assure a more even sample of all customers. The parking lots are charted out and sampled to insure an even sample from all parts of the lot. Different hours are rotated to insure a sample of customers from as many times as possible. After three weeks of this rigorous sampling design, a sample of 1819 license numbers from the three shopping centers were obtained.

The results of this procedure are displayed only to emphasize the output of the method. The arrangement of the material is displayed only to relate possible analysis that could be made. Since analysis was not the main objective in this research, the results are merely displayed and not rigourously tested or subjected to all variables.

The data obtained from this sample are divided up into the classes: Honeycreek Mall, North Plaza, and K-Mart Plaza. Several categories are found for each of the shopping centers. License tags are then grouped into the categories. These categories are based on conglomerations of license plate areas and for Honeycreek Mall consist of: 1) Illinois license numbers, 2) Terre Haute license numbers, 3) License numbers from South of Terre Haute, and 4) other assorted license numbers from all over the state of Indiana.

The license numbers from North Plaza are divided into 1) those customers from Terre Haute, 2) those customers from north of Terre Haute, and 3) customers from other parts of the state. K-Mart Plaza license numbers are divided into 1) Terre Haute customers 2) those numbers from east of Terre Haute, and 3) other assorted numbers from various parts of the state. It must be noticed that a category of numbers is included for the direction that each

shopping center is from Terre Haute (north for North Plaza, South for Honeycreek, and east for K-Mart Plaza).

The results of the study are then tabulated according to the categories for each shopping center. Honeycreek Mall has a total of 614 license numbers collected over the three week period. Out of these 614 numbers, 17% or 101 came from communities south of Terre Haute. Another 156 or 25% of the total came from Illinois to Honeycreek Mall. A total of 208 of the 614 came from Terre Haute which made up 34%. The other 149 license tags constituted 24% of the total 614 and came from the final category assigned to "other" communities in the state.

A total of 607 license numbers were collected over the three week period for North Plaza. The first category that these are divided into is the customers from north of Terre Haute. This category makes up 25%, or 151 customers out of 607 samples. Another 65% or 393 license numbers came from Terre Haute to shop at North Plaza. The final category is other cars coming from the other areas of the state, and makes up 10% or 63 of the total 607 license numbers.

The final shopping center, K-Mart Plaza, has a total of 598 license numbers collected over the three week period. Of these, 109, or 18%, are from communities to the east of Terre Haute. A total of 388, or 65% are from Terre Haute. The final category of K-Mart Plaza is those license numbers from other parts of the state not included in the other categories which consisted of 17% or 101 of the total 598. It must be remembered at this point that all of the above percentages are based upon the total number of license numbers per shopping center, and not the total of 1819 samples for the entire study.

The data so far can be summarized in the following chart (Table I). This material was displayed as totals for all three weeks.

TABLE I License Number Distributions
Total = 1819

	No.	%
Total from South coming to Honeycreek	101	17
Total Illinois coming to Honeycreek	156	25
Total Terre Haute coming to Honeycreek	208	34
Total other coming to Honeycreek	149	24
Total	614	100%
Total from North coming to North Plaza	151	25
Total from Terre Haute coming to North Plaza	393	65
Total other coming to North Plaza	63	10
Total	607	100%
Total from East coming to K-Mart Plaza	109	18
Total from Terre Haute coming to K-Mart	388	65
Total other coming to K-Mart Plaza	101	17
Total	598	100%

The basic trends can be extracted from this display, but other presentations also tend to bring out further information that could be analyzed.

The following chart (Table II) breaks the data down into week one, two, and three for each shopping center. The numbers are then broken down to the specific day (Saturday or Sunday) in each weekend.

TABLE II *Display of Raw Data by Weeks*

	Week #1			Week #2			Week #3		
	Sat.	Sun.	total	Sat.	Sun.	total	Sat.	Sun.	total
Total from South coming to Honeycreek	16	16	32	13	20	33	16	20	36
Total from Illinois coming to Honeycreek	16	14	30	32	26	58	36	32	68
Total from Terre Haute coming to Honeycreek	39	46	85	30	35	65	29	29	58
Total other coming to Honeycreek	25	28	53	26	29	55	21	20	41
Total from North coming to North Plaza	21	21	42	36	25	61	27	21	48
Total from Terre Haute coming to North Plaza	66	73	139	58	73	121	62	71	133
Total other coming to North Plaza	14	9	23	6	12	18	9	13	22
Total from East coming to K-Mart Plaza	16	18	34	12	21	33	17	25	42
Total from Terre Haute coming to K-Mart Plaza	70	66	136	73	58	131	63	58	121
Total other coming to K-Mart Plaza	15	15	30	16	20	36	22	13	35

The Analysis

In order to properly analyze the data, several economic concepts must be kept in mind. All of these concepts, and the hypothesis of this paper, are based on the assumption that individual consumers behave, on the average, in a predictable fashion. The consumer travel behavior of individuals is related to 1) the characteristics of individuals, 2) the way in which they perceive the array of places to which they may travel, and 3) the individuals' image of the total friction of distance between places of residence and the places where the individual may acquire the desired good or service (3).

The first fact to be analyzed was the relationship of the customers which came from the areas closest a particular shopping center. Customers usually appear to make systematic choices of the closest centers offering the goods they need (2). We would then assume that the communities from the south would patronize Honeycreek Mall; communities from the north patronize North Plaza, and communities from the south patronize Honeycreek mall, and communities from the east patronize K-Mart Plaza. When examined from the sampling data, we find that of a total of 614 license numbers taken at Honeycreek Mall, 406 are non-Terre Haute customers. Out of the 614 customers, only 17% or 101 came from the south to shop at Honeycreek Mall. The rest of the non-Terre Haute customers came from Illinois 25% or 156 and other assorted areas in Indiana 24% or 149. The high number of Illinois customers is probably due to the close proximity of the state of Illinois to Honeycreek Mall and also to the close proximity of Honeycreek Mall to a major highway system (Interstate 70) that runs through Illinois into Indiana.

North Plaza seems to follow the theory of closer distance more closely than Honeycreek Mall. The non-Terre Haute customers at North Plaza amount to 214 out of 617 total over the three week period. Of the 607 total, 25% or 151 came from the north of Terre Haute. Only 10% of the 607 total came from areas other

than Terre Haute and north of Terre Haute. In other words, 70% of the non-Terre Haute customers are from the north of Terre Haute.

K-Mart Plaza had a total of 210 or 35% out of 598 that are non-Terre Haute customers. Of the 598 total customers, 18% came from the east to visit K-Mart and 17% came from places other than Terre Haute or east of Terre Haute to shop at K-Mart. In other words, 52% of the non-Terre Haute customers are from the east and 48% from other areas in Indiana.

It, therefore, is evident that the bulk of the non-Terre Haute customers are not necessarily from the nearby southern communities for Honeycreek and the nearby eastern communities for K-Mart Plaza. It is true, however, that a larger percentage of the non-Terre Haute customers shopping at North Plaza are from the nearby northern communities. The observation that Honeycreek Plaza and K-Mark Plaza tend not to attract a larger customer trade from the closer southern and eastern (respectively) communities is not distinct only to this case. Other studies indicate that individuals do not necessarily shop at the nearest center where a good is available (3).

Several reasons can be presented for the distribution of customers at Honeycreek and K-Mart Plaza. Shopping centers can carry a definite delimitation and classification (7). Shopping centers vary in trading characteristics and organization so that people perceive centers as more attractive because of more or different choices and because of associated activities. Honeycreek Mall attracts a more even percentage from the four categories than the other shopping centers. (17%, 25%, 34%, 24% in the four categories) This could be due to a greater diversification of goods as well as a location in an easily accessible area. K-Mart Plaza offers a different phenomena that has been known to change the shortest distance tendencies (1). The presence of a discount center in the Plaza tends to equal out the percentages of people coming from all areas, as can be seen in the data (East 18%, other 17%). The different department stores "magnets" of these shopping centers also tends to spread out the distributions because people patronize department stores according to their own personal preferences (1).

Another interesting analysis from this data can be drawn from the Terre Haute customers. Since they are relatively near all three centers, it is interesting to note how they tend to patronize these three shopping centers. Honeycreek has the least Terre Haute customers of the three shopping centers (34% of the total license numbers), North Plaza and K-Mart Plaza have equal Terre Haute patronages (65% for each). This could be true because Terre Haute people tend to avoid the busier areas (Honeycreek) when they seek goods that will be found elsewhere with less confusion. Also the K-Mart discount store offers a quick, low cost facility with east access for Terre Haute customers.

Conclusions

In conclusion, it can be said that the hypothesis of this paper has been proven as valid. Using field techniques, it is possible to determine customer origin characteristics for the specifically defined shopping centers and possible analysis methods can be utilized with the data obtained. The purpose of the

study is to present the method and reasons for using the method, as well as to present an example of the process actually being utilized.

The utility of this study can be applied in several ways. Shopping center stores would be interested in advertising in the areas that tend to have more customers, or they might be interested in concentrating on areas that do not support them as much as might be expected. Any store that is interested in making a profit will be interested in where its customers come from. Honeycreek Mall had a customer range that is more equally divided among the different areas, possibly indicating a regional shopping center, so store owners should know how to avoid limiting their advertising to one specific area. North Plaza attracts mostly Terre Haute customers, but emphasis should also be put on areas north of Terre Haute. K-Mart Plaza, for the most part, has most of its customers from Terre Haute, so the emphasis should be placed within Terre Haute. Other utilities of this study can be found in transportation planning, new store development, and new housing development.

Any good research problem that is investigated properly, always gives rise to other problems that are not in the scope of the research, but can be investigated in another study. Several problems can be drawn from this study. Is there a definite economic class system that is exhibited between the different centers? Do customers from different areas have specific times that they tend to patronize the shopping centers within? Is it feasible to establish a shopping center in west Terre Haute? These questions and several more require specific studies and further applications of field techniques.

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