Targeted Demographics by Proximity

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Abstract

Selection of retail locations are important business decisions with numerous implications. But is the common perception, aided by targeted demographic marketing, held by consumers over the target consumers for different companies reflected with regard to site selection? Simply put, Whole Foods is seen as generally targeting wealthier, more educated individuals, do their store locations reflect this? Alternatively, Walmart has the stigma of aiming more towards the common consumer, if not those of less education and lower levels of wealth. Identifying three distinct companies, Sprouts, Whole Foods,

and Walmart, this study will attempt to ascertain if their retail locations show a discrepancy with regard towards four demographic variables: Median Income, Post Graduate degree attainment, Median Net Worth, and Home Ownership.

Introduction

In marketing, companies attempt to define and classify consumers into segments known as demographics. This framework can then be used to customize advertising for a specific group of consumers and build up a consumer marketing strategy to attract the consumers that provided the best possibilities for sustained sales or future growth. This form of targeted advertising employed mainly through physical print and, increasingly, online media (Chen & Stallaert, 2010).

A question can then be raised, how much does specific retail location reflect this consumer perception that is built up through marketing. Many locations may have been chosen before the proliferation of online advertising, even before the advent of the internet itself. Those chosen more recently may fall into more pressing economic decisions over retail location than simply proximity to desired consumers, business costs such as rent and other location specific expenditures. While proximity to desired, or targeted, consumers may seem overwhelmingly important to the consumer, the focus of the targeted strategy, do the facts of actual locations bear out these assumptions?

Identifying Sprouts, Whole Foods, and Walmart as three related and commonly used food stores, albeit with differentiating consumer marketing strategies, this study will attempt to identify if

there exists a discernible and statistical difference between the locations of these retail locations. The study focuses on stores located within San Diego County with respect to four demographic variables: Median Income, Post Graduate degree attainment, Median Net Worth, and Home Ownership. Consistent relations within these four variables would imply that the companies in question do employ these demographics when considering retail locations. A lack of consistent or statistically significant results would imply the relative importance of other potential variables when performing a site suitability analysis when determining ideal retail locations.

Data Selection and Acquisition

The base data includes retail locations within San Diego County of all Sprouts, Whole Foods, and Walmart. Walmart stores locations were acquired in comma separated value form from collaborative data community data.world, provided by datahut.co for public consumption. Whole Foods locations were also acquired in comma separated value form from website data.world, provided by Hayden Diede for public consumption. Location addresses for Sprouts stores were attained from their corporate website Sprouts.com, and manually entered into comma separated value form. All three data sources were then geocoded into ArcMap through ArcGISOnline functionality.

San Diego County infrastructure data as well as the four variables: Median Income, Post Graduate degree attainment, Median Net Worth, and Home Ownership, were attained from the 2010 US Census. All values were analyzed using their Current Year form. This data was acquired through ArcGISOnline.com, as provided by ESRI.

Methodology

Once all data sources were inputted into GIS form, all four variables were analyzed using the same sequence to allow for comparison. First the variable would be symbolized, ensuring identical five breaks were employed across each company. Break points where determined using the Jenks Natural Break classification method. Median Income and Median Net Worth were symbolized independently, Post Graduate degree attainment used the total number of Post Graduate/Professional degrees normalized as a percentage of total secondary degree attainment, and Home ownership employed home ownership as a percentage of total dwellings. This allowed a visual inspection of retail location against the backdrop of the variable in question.

Next each variable was analyzed using a Getis-Ord hot spot analysis with the variable in question as input parameter and employing a distance band of one US mile (5280 US feet). This allowed for another visual analysis of retail location in proximity to clustering of high and low values of the variable. Total location percentage in or adjacent to hot spots and cold spots were recorded.

Each variable was then given a one US mile buffer and a one-to-three US mile buffer with the Multi-ring Buffer tool. Each buffer ring was the extracted using the Intersect tool to create a new map layer, with an Area field added to the attribute table, calculated for total US square milage. This allowed the computation of total area for each of the five categories as defined by the break points. This identically produced data could then be used for comparison across the three differing companies with a direct comparison of proximity with regards to the designated variable.

Results

Income:

With respect to Median Income, Walmart locations were spread in a normal distribution pattern with the mean income rising from $69,996 at one mile (Table 1) to $79,638 between one and three miles (Table 2). Sprouts moves from a mean income of $88,190 at one mile with a mostly normal distribution (Table 3) towards a mean income of $87,770 at one to three miles with a skew towards the higher income levels (Table 4). Whole Foods starts at a mean income of $97,969 at one mile (Table 5) and moves down to a mean income of $92,391 at one to three miles (Table 6), with both sets of data skewing towards higher income levels.

In the Income Summary for one mile (Table 7) and one to three miles (Table 8), it can be observed that Walmart is normally distributed with the lowest mean incomes, Sprouts has a higher mean income and is skewed slightly towards the higher incomes, and Whole Foods has both the highest mean income and the greatest tilt towards the higher income levels.

Post Grad Degree:

With respect towards post graduate degree attainment, Sprouts moves from a rather normal distribution at one mile (Table 9), towards being heavily skewed to higher degree attainment at one to three miles (Table 10). Whole Foods, at one mile, skews so heavily towards higher attainment as to not have a significant value of the two lowest levels, and the two highest level compromising 90% of total area (Table 11), while one to three miles out expands to include attainment at all levels, but the two highest levels still compromising 76% (Table 12). Walmart holds to a rather normal distribution at both one (Table 13) and one to three miles (Table 14).

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In the Post Grad Summary for one mile (Table 15) and one to three miles out (Table 16) both Walmart and Sprouts a distributed more normally, with Sprouts at one to three miles slightly favoring a higher level of degree attainment, while Whole Foods is heavily skewed towards higher levels of degree attainment at both proximity states.

Median Net Worth:

With respect to median net worth, both Sprouts at one mile (Table 17) and one to three miles (Table 18), and Walmart at one (Table 19) and one to three miles (Table 20) are slightly skewed towards lower net worth. Whole foods also skew towards lower net worth values at both one mile (Table 21) and one to three miles (Table 22), but with noticeable spikes in the highest net worth classification. This consistency can be seen int the Summary for one mile (Table 23) and one to three miles (Table 24).

Home Ownership:

With respect to home ownership Sprouts at one mile (Table 25) has a mostly even distribution and one to three miles (Table 26) with a slight skew towards higher home ownership. Walmart stores almost evenly match those of Sprouts at both one mile (Table 27) and one to three miles (Table 28). Whole Foods skews lower levels of home ownership at one mile (Table 29) and then moves towards a more equivalent distribution one to three miles (Table 30). These relationships can be observed in the Summary for one mile (Table 31), and one to three miles (Table 32).

Hot Spot Analysis:

Perhaps one of the most intriguing results is the analysis of retail locations within or adjacent to hot and cold spots. The distribution of all stores with regard to income (Table 33) and net worth (Table 34) is remarkably consistent. This consistency more or less also holds up with regards to post graduate

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degree attainment (Table 35) and home ownership (Table 36) with slightly more variance. The one extreme outlier is the amount of Whole Foods locations in cold spots with regard to home ownership, but the small sample size of Whole Foods locations (only three within San Diego County) could account for this, as well as enhance the consistency with regards towards the other three variables.

Conclusions

The analysis can conclude that the variables in question do bear out a differentiation with regards towards site selection for the three companies. Walmart stores generally follow a more normal distribution across median income, post graduate degree attainment, and median net worth. Sprouts follows this pattern while skewing slightly in favor higher levels, and Whole Foods also follows this pattern while skewing even further than Spouts towards higher levels with regard towards the three mentioned variables. The one variable that eschews this distribution is the of median net worth, in which all three company's data skews towards lower levels. Yet even in this category Sprouts displays a slight advantage over Walmart in favoring higher net worth levels, and Whole Foods capturing the highest percentage of stores located in proximity of areas with high median net worth.

While this study does not attempt to precisely quantify the relationship between these retail locations and the four variables, it does conclude that there exists enough of a statistical significance that a study of exact quantification could produce meaningful results. Additionally, while this study did produce results in San Diego County, it would need to be reproduced in several more areas to examine whether the results would hold across multiple areas.

References

Chen, J., & Stallaert, J. (2010). An Economic Analysis of Online Advertising Using Behavioral Targeting. *SSRN Electronic Journal*. doi:10.2139/ssrn.1787608
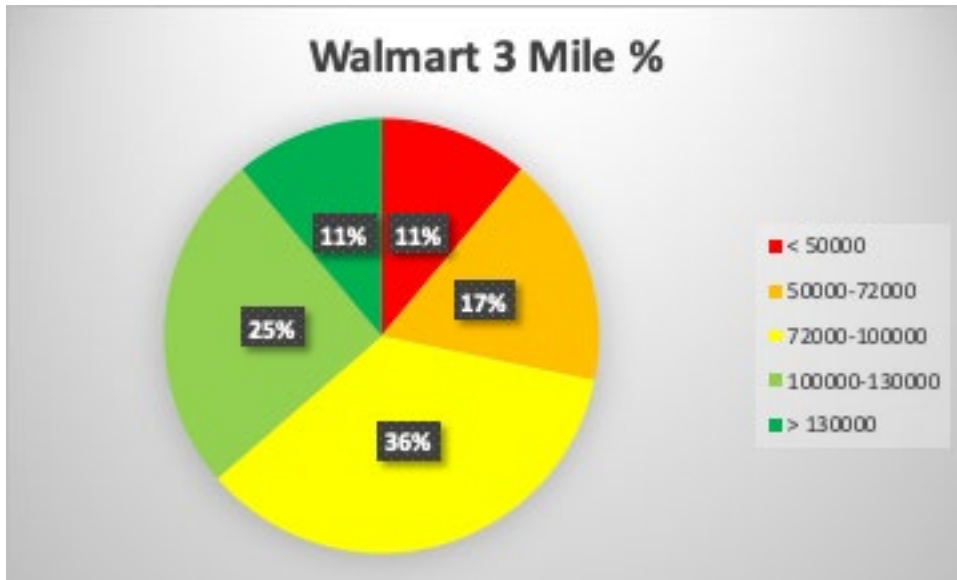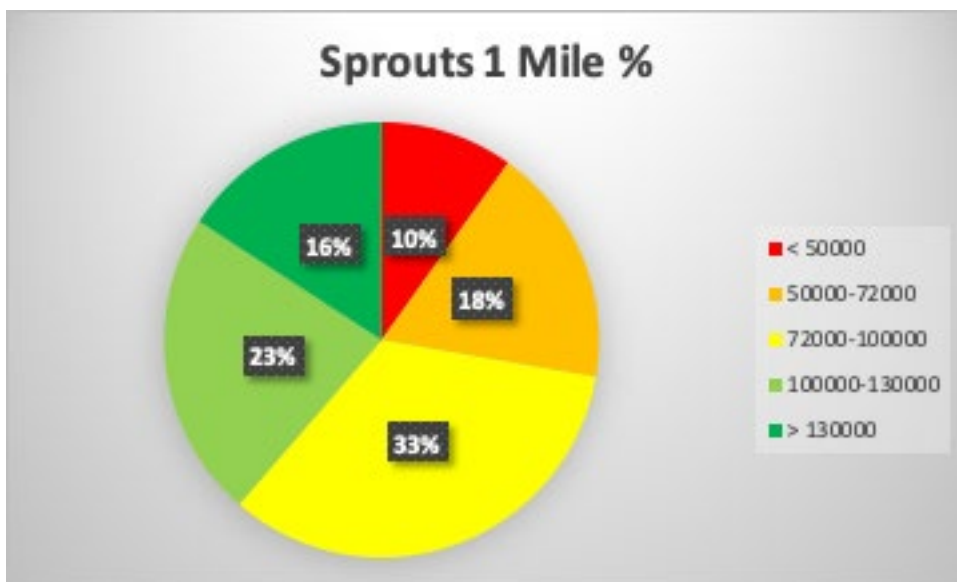
Appendix

Table 1:
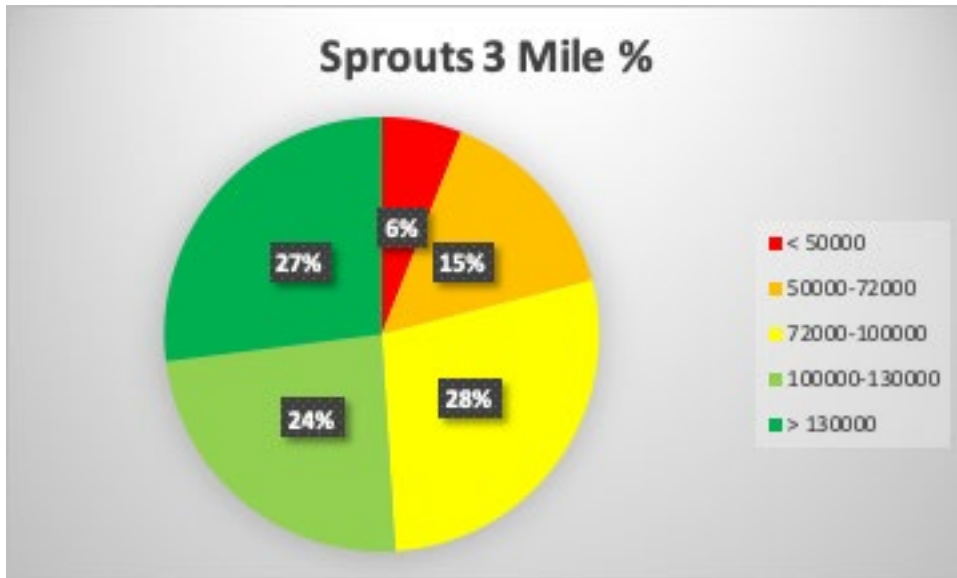

Table 2:

Walmart 3 Mile %

Table 3:

Sprouts 1 Mile %

Table 4:

Sprouts 3 Mile %

Table 5:

WholeFoods 1 Mile %

Table 6:

10

WholeFoods 3 Miles %

Table 7:

Income 1 Mile

Table 8:

11

Income 1-3 Miles

Table 9:

Sprouts 1 Mile %

Table 10:

12

Table 11:

Table 12:

13

Table 13:

Table 14:

14

Walmart 3 Mile %

Legend:
- <15%
- 15% - 24%
- 25% - 33%
- 34% - 44%
- >45%

Values shown: 11%, 29%, 34%, 22%, 4%

Table 15:

PostGrad 1 Mile

	<15%	15% - 24%	25% - 33%	34% - 44%	>45%
Sprouts 1 Mile %	8	21	34	26	11
Whole Foods 1 Mile %	0	0	10	25	65
Walmart 1 Mile %	11	29	34	22	4

Table 16:

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PostGrad 1-3 Miles

	<15%	15% - 24%	25% - 33%	34% - 44%	>45%
Sprouts 3 Mile %	6	20	27	37	9
Whole Foods 3 Mile %	3	2	19	40	35
Walmart 3 Mile %	11	29	34	22	4

Table 17:

Sprouts 1 Mile %

- 43% <130000
- 31% 130000-330000
- 14% 330000-600000
- 8% 600000-975000
- 4% >975000

Table 18:

Table 19:

Table 20:

Walmart 3 Mile %

Legend:
- <130000
- 130000-330000
- 330000-600000
- 600000-975000
- >975000

41%, 33%, 15%, 6%, 5%

Table 21:

Whole Foods 1 Mile %

Legend:
- <130000
- 130000-330000
- 330000-600000
- 600000-975000
- >975000

63%, 17%, 14%, 4%, 2%

Table 22:

18

Table 23:

Table 24:

19

Net Worth 1-3 Miles

Net Worth	Sprouts 3 Mile %	Whole Foods 3 Mile %	Walmart 3 Mile %
<130000	35	46	40
130000-330000	26	11	33
330000-600000	16	12	15
600000-975000	10	6	6
>975000	12	25	5

Table 25:

Sprouts 1 Mile %

13%	< 27%
19%	27% - 46%
23%	47% - 64%
23%	65% - 78%
22%	> 79%

Table 26:

20

Sprouts 3 Mile %

Table 27:

Walmart 1 Mile %

Table 28:

Walmart 3 Mile %

Color	Range
Red	< 27%
Orange	27% - 46%
Yellow	47% - 64%
Light Green	65% - 78%
Green	> 79%

- 10%
- 12%
- 35%
- 22%
- 21%

Table 29:

Whole Foods 1 Mile %

Color	Range
Red	< 27%
Orange	27% - 46%
Yellow	47% - 64%
Light Green	65% - 78%
Green	> 79%

- 15%
- 27%
- 3%
- 22%
- 33%

Table 30:

22

Whole Foods 3 Mile %
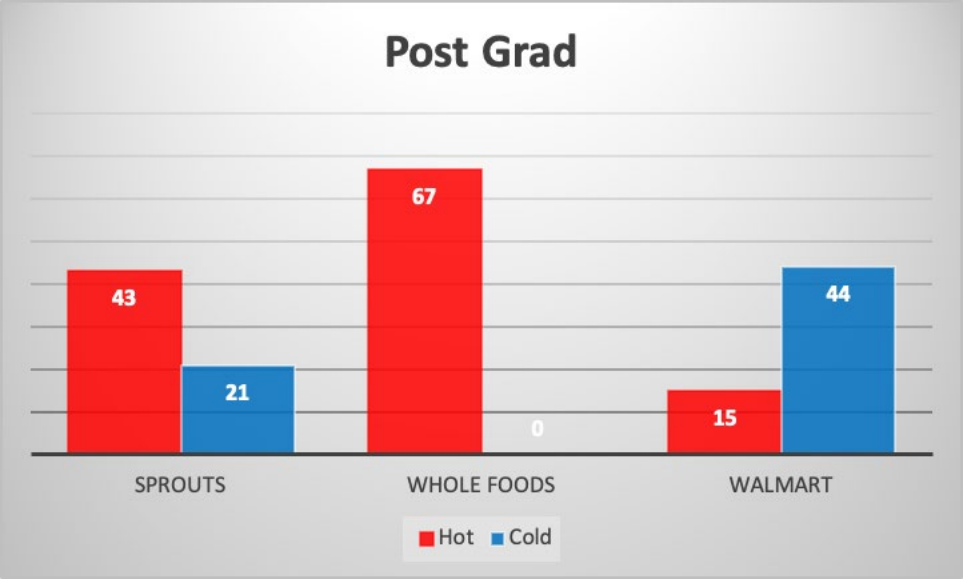
Table 31:

Home Ownership 1 Mile

Table 32:

23

Home Ownership 1-3 Miles

	< 27%	27% - 46%	47% - 64%	65% - 78%	> 79%
Sprouts 3 Mile %	8	12	22	22	36
Whole Foods 3 Mile %	22	15	25	9	29
Walmart 3 Mile %	10	12	22	22	36

Table 33:

Income

	SPROUTS	WHOLE FOODS	WALMART
Hot	43	67	7
Cold	25	33	52

Table 34:

24

Table 35:

Table 36: