# Counting the Costs: Connecting Associates Degrees in Math and Statistics with Dollar Store Searches 

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## ABSTRACT

## Counting the Costs: Connecting Associates Degrees in Math and Statistics with Dollar Store Searches

This study explores the surprising link between the number of Associates degrees awarded in Mathematics and statistics and Google searches for 'dollar store near me'. Researchers examined data from the National Center for Education Statistics and Google Trends to uncover this unexpected correlation, aiming to shed light on the economic behaviors associated with mathematical education. Our analysis revealed a remarkably high correlation coefficient of 0.9912195 for the period spanning 2011 to 2021, with a statistical significance of $p<0.01$. This strong association suggests that a penchant for mathematical and statistical knowledge may lead individuals to seek out cost-effective shopping options, such as dollar stores, providing a whole new meaning to the phrase "number crunching." In conclusion, it seems that the pursuit of math and statistics education may be indicative of a frugal mindset, as evidenced by the heightened interest in dollar stores. As researchers, we marvel at the unexpected ways in which academia and economics intersect, adding a new dimension to the phrase "math adds up.

Keywords:
Associates degrees, Mathematics, Statistics, Dollar store searches, Google Trends, National Center for Education Statistics, Economic behaviors, Correlation coefficient, Statistical significance, Frugal mindset, Cost-effective shopping options

## I. Introduction

The pursuit of knowledge in mathematics and statistics has long been regarded as an important aspect of academic and professional development, with its influence evident in various facets of everyday life. However, the unexpected connection between individuals earning Associates degrees in these disciplines and their Google searches for 'dollar store near me' provides a fresh perspective on the potential economic implications of mathematical education. It seems as though the age-old question of "What's in store?" may have a more literal answer than previously thought.

As researchers, we've always enjoyed crunching numbers and uncovering unexpected correlations, but this particular association between mathematical education and dollar store searches has left us counting our blessings for stumbling upon such an intriguing relationship. It seems that the pursuit of numerical proficiency may lead individuals to seek out bargains in more ways than one, exemplifying the principle that "where there's a will, there's a wave function."

This study seeks to delve into an unexplored realm where academia and consumer behavior intersect, shedding light on the potential economic motivations of individuals with a background in mathematics and statistics. It appears that a deeper comprehension of numbers may indeed translate to an affinity for hunting down a good deal, leading us to ponder the relevance of the adage "show me the money - and the nearest dollar store."

The aim of this research is to unravel the underlying drivers of this unlikely association, and to explore the implications for educational and economic policies. Is it mere coincidence, or is there a genuine connection between the calculus of mathematical education and the quest for
affordable commodities? As the saying goes, "it all adds up," and we are determined to uncover the integral components that contribute to this intriguing correlation.

Stay tuned as we embark on an enlightening journey into the intersection of mathematical education and consumer behavior, as we attempt to "factor" in the unexpected variables that make this correlation a solution worth solving.

## II. Literature Review

The unexpected connection between the pursuit of mathematical and statistical knowledge and the propensity to search for 'dollar store near me' has piqued the interest of researchers and economists alike. Smith and Doe (2018) conducted a comprehensive analysis of data from the National Center for Education Statistics and found a strong positive correlation between the number of Associates degrees awarded in Mathematics and statistics and the volume of Google searches for dollar stores in the surrounding areas, reaffirming the surprising nature of this association.

However, such an intriguing correlation prompts one to wonder - what could be the underlying reasons for this statistical phenomenon? Could it be that individuals with a proficiency in numbers and calculations possess a keen eye for budget-friendly shopping, leading them to seek out dollar stores with a calculating demeanor? Jones (2020) suggests that the attraction to dollar stores among individuals with a mathematical background may stem from a proclivity for arithmetic precision and an appreciation for the value of a good deal, thereby contributing to the correlation found in the study.

In a similar vein, the relationship between mathematical education and consumer behavior has been a topic of interest in non-fiction works such as "Economics and Numeracy" by Anderson (2021) and "The Frugal Mathemagician's Guide to Shopping" by Wilson (2019). These analyses provide a more holistic understanding of the potential implications of mathematical education on economic decision-making, shedding light on the multifaceted connections between academia and everyday consumer actions.

Moreover, the unexpected correlation unearthed in our study brings to mind the fictional works of "The Statistical Shopper's Almanac" by Brown (2015) and "Calculating Discounts: A Tale of Mathematical Shopping" by Taylor (2018), which, albeit fictional, humorously demonstrate the intersection of math education and the pursuit of cost-effective shopping. These imaginative works prompt a lighthearted exploration of the potential motivations behind the correlation, intertwining mathematical prowess with the art of bargain hunting.

In addition, the authors deemed it pertinent to expand their research beyond traditional academic sources and delve into unsuspecting realms, such as the realm of children's television programming. The analysis observed in the popular animated series "Number Crunchers" and "Math Mysteries with Professor Penny Pincher" offered unexpected insights into the potential influence of mathematical education on behavior, reinforcing the playful yet thought-provoking nature of this correlation.

Consequently, while the connection between Associates degrees in Mathematics and statistics and Google searches for 'dollar store near me' may seem unorthodox at first glance, the literature reveals a multifaceted and whimsical exploration of this unexpected association. As the adage goes, "when it comes to math and shopping, the possibilities are infinite."

## III. Methodology

The dataset for this study was obtained from the National Center for Education Statistics, providing detailed and comprehensive information on the number of Associates degrees conferred in Mathematics and statistics from 2011 to 2021. Google Trends data was also utilized to capture the frequency of searches for 'dollar store near me' over the same time period, creating a robust dataset with a wealth of variables ripe for statistical exploration. Our team was reminded of a classic math pun during this data collection phase - "Parallel lines have so much in common. It's a shame they'll never meet."

To analyze the relationship between Associates degrees awarded in Mathematics and statistics and the Google searches for 'dollar store near me', we employed a series of statistical methods. First, we calculated the Pearson correlation coefficient to quantify the strength and direction of the linear relationship between the two variables. This analysis was accompanied by a scatterplot, a graph as endearing as our favorite statistics professor's quirky sense of humor. Furthermore, to ascertain the statistical significance of the association, we performed a two-tailed t-test to evaluate whether the correlation between these variables could have occurred by chance. This method allowed us to determine the likelihood of obtaining the observed correlation coefficient if the true correlation were zero, providing us with a p-value that may be considered significant evidence against the null hypothesis. It feels fitting to mention here that "Statisticians, like artists, have the bad habit of falling in love with their models."

As a supplementary analysis, we employed a time-series analysis to observe any temporal patterns or trends in the data. This involved decomposing the time series into its constituent components to examine any underlying seasonality, trend, and randomness. The results of this analysis were as enlightening as the moment a light bulb goes off over a researcher's head.

Finally, we conducted a regression analysis to model the relationship between Associates degrees awarded in Mathematics and statistics and the frequency of searches for 'dollar store near me', allowing us to evaluate the predictive power of mathematical education on consumer behavior. This process revealed a model as robust as a sturdy bridge connecting two disparate disciplines. The statistical methods used in this study made for a toolset as versatile as a Swiss Army knife, allowing us to dissect the intricate relationship between educational attainment and consumer behavior with precision and finesse.

## IV. Results

The data analysis revealed a remarkably high correlation coefficient of 0.9912195 between the number of Associates degrees awarded in Mathematics and statistics and the volume of Google searches for 'dollar store near me' over the period of 2011 to 2021. This strong correlation raises the age-old question of whether those who excel in math are also adept at counting their pennies. The r-squared value of 0.9825161 further emphasizes the robustness of the relationship, indicating that an overwhelming 98.25\% of the variability in dollar store searches can be explained by the number of mathematics and statistics degrees awarded. It appears that when it
comes to finding the nearest dollar store, individuals with a mathematical background are quite adept at drawing a "line" towards the best bargains.

The p-value of less than 0.01 provides compelling evidence to reject the null hypothesis of no relationship between these variables, prompting us to reflect on the plain and simple fact that this correlation is no mere statistical coincidence. It seems that those with a fondness for mathematical pursuits are also keen on calculating the best deals in town.


Figure 1. Scatterplot of the variables by year

Figure 1 illustrates the scatterplot depicting the strong positive correlation between the number of Associates degrees awarded in Mathematics and statistics and the frequency of Google searches for 'dollar store near me'. The scatterplot appears to suggest that as the number of degrees awarded increases, so does the interest in locating the closest dollar store, leaving us to ponder whether math literacy paves the way for financial frugality.

## V. Discussion

The results of the analysis unequivocally support the prior research findings on the connection between the number of Associates degrees awarded in Mathematics and statistics and the frequency of Google searches for 'dollar store near me'. The robust correlation coefficient of 0.9912195 affirms that there is indeed a strong positive relationship between these variables. It seems that those who demonstrate proficiency in mathematical and statistical knowledge also exhibit a penchant for seeking out economical shopping options. This finding provides a new dimension to the phrase "number crunching," as it appears to extend beyond numerical calculations into the realm of budget-conscious consumer behavior.

The results of this study prompt us to reconsider the age-old question of whether individuals with mathematical acumen are also adept at counting their pennies. It appears that the pursuit of mathematical and statistical education is indeed indicative of a frugal mindset, as evidenced by the heightened interest in dollar stores. This unexpected correlation adds a whole new angle to the phrase "math adds up" - not only in the academic sense but also in the context of fiscal prudence.

The high r-squared value of 0.9825161 further validates the robustness of the relationship between Associates degrees awarded in Mathematics and statistics and the volume of Google searches for 'dollar store near me', indicating that an overwhelming 98.25\% of the variability in dollar store searches can be explained by the number of mathematics and statistics degrees awarded. It seems that individuals with a mathematical background are not just adept at drawing a "line" in figures but also in navigating their way towards the best bargains, proving that for them, it's all about the "calculus" of a good deal.

Furthermore, the statistically significant p-value of less than 0.01 provides compelling evidence to reject the null hypothesis of no relationship between these variables. This leads us to reflect on
the fact that this correlation is no mere statistical coincidence but a meaningful indication of the influence of mathematical education on consumer behavior. It seems that those with a fondness for mathematical pursuits are not just inclined towards numerical precision but also possess a keen ability to calculate the best deals in town. This finding humorously reinforces the validity of the saying, "math makes cents."

In conclusion, the unexpected and robust correlation uncovered in this study has shed light on the previously unexplored intersection between mathematical education and consumer behavior. This study provides a lighthearted yet thought-provoking exploration of the potential implications of mathematical knowledge on economic decision-making, reaffirming the multifaceted and whimsical nature of this unexpected association. As the proverbial saying goes, "when it comes to math and shopping, the possibilities are infinite."

## VI. Conclusion

In conclusion, the findings of this study highlight a remarkably strong correlation between the number of Associates degrees awarded in Mathematics and statistics and the volume of Google searches for 'dollar store near me'. It appears that those skilled in the art of numbers may also have a penchant for seeking out economical shopping options, providing a whole new meaning to the phrase "number crunching." It seems that when it comes to finding bargains, these individuals don't just calculate percentages, they also calculate savings - talk about a "prime" example of frugality!

As we reflect on these unexpected results, it is evident that the pursuit of mathematical and statistical education may be indicative of a thrifty mindset, leading individuals to 'sum' monies saved at dollar stores. This correlation certainly adds a new dimension to the phrase "math adds up," as it seems to prove that math education is equated not only with analytical skills but also with savvy consumer behavior. It leaves us to 'integrate' this newfound understanding into the broader context of economic decision-making and resource allocation, proving that the world of statistics and shopping is a "binomial" that never fails to surprise.

Therefore, it may be safe to say that further research in this area is unnecessary. After all, we've 'counted' the correlation and 'multiplied' our understanding. The connection is clear, and no more 'data points' are needed to understand that mathematicians may indeed have a knack for 'counting their dollars' while also counting their numbers!

