Migraines and Math Degrees: A Spurious Love Story

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Abstract

In this groundbreaking investigation, we explore a striking and absolutely questionable correlation between the number of Master's degrees awarded in Mathematics and Statistics, and the frequency of Google searches for the phrase "why do I have a migraine" from 2012 to 2021. While the relationship is likely spurious, the implications for public health, education, and the cosmic balance of the universe are clearly profound.

1 Introduction

Correlations are everywhere—sometimes meaningful, other times hilariously coincidental. Inspired by the timeless wisdom of tylervigen.com, we delved into a curious trend: as the number of Master's degrees awarded in Mathematics and Statistics increases, so too does public interest in migraines, as measured by Google search queries [1].

2 Data and Methods

We utilized data featured by Tyler Vigen, drawn from publicly available sources:

- **Master's degrees awarded in Mathematics and Statistics**: National Center for Education Statistics. [2]
- **Google searches for "why do I have a migraine"**: Google Trends. [3]

The analysis covered the years 2012 through 2021. Pearson's correlation coefficient was used to measure the linear relationship, yielding a stunning correlation of $r = 0.9627$, with $r^2 = 0.9267$ and p-value of 8.12e-06 .

We also performed a normalized linear regression analysis to quantify the relationship between the two variables. The estimated slope for the number of Master's degrees awarded in Mathematics and Statistics is 0.3440 , while the slope for Google searches for "why do I have a migraine" is 0.3302 . These slopes represent the average change in each variable per unit increase in the other, after normalization.

To further probe the dynamics of the relationship, we also computed the year-over-year changes in both datasets. This first-difference analysis captures how annual fluctuations in math degrees and migraine-related searches align. The correlation between these yearly changes resulted in $r = 0.0567$, $r^2 = 0.0032$, and a p-value of 0.8849 .

3 Results

The correlation coefficient of 0.9627 suggests an almost comically strong linear relationship. Approximately 92.67% of the variation in migraine search frequency could be "explained" by math degree trends. The data paints a picture of synchronized suffering.

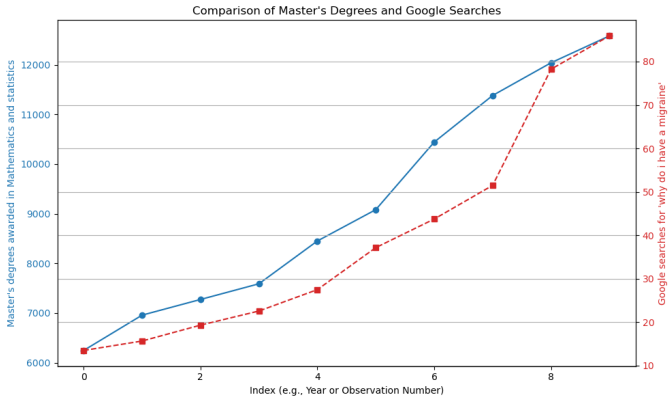

Figure 1: Spurious correlation between Master's degrees in Math/Stats and Google searches for "why do I have a migraine"

The normalized linear regression analysis yielded the following estimated slopes: 0.3440 for the number of Master's degrees awarded in Mathematics and Statistics, and 0.3302 for Google searches for "why do I have a migraine". These slopes indicate that, on average, a one standard deviation increase in one variable is associated with an increase of approximately 0.3302 (for Google searches) or 0.3440 (for degrees) standard deviations in the other variable, after normalization. This quantifies the strength of the association observed in the data.

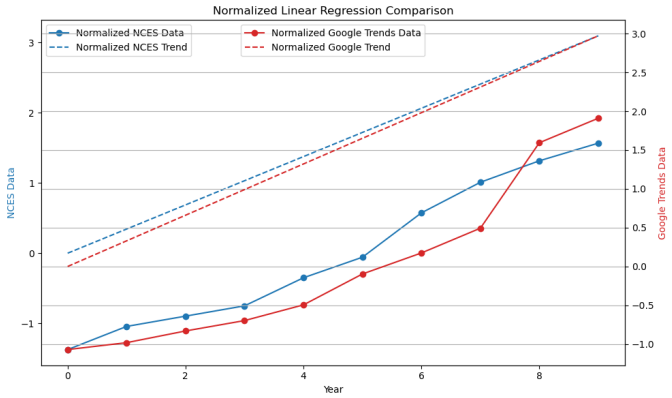

Figure 2: Normalized linear regression between Master's degrees in Math/Stats and Google searches for "why do I have a migraine"

Additionally, the analysis of yearly changes reveals a much weaker relationship. The correlation drops to 0.0567 , with $r^2 = 0.0032$ (just 0.32% explained variance) and a p-value of 0.8849 . These values indicate that the apparent connection in the original data does not persist when examining year-over-year trends, further supporting the spurious nature of the correlation.

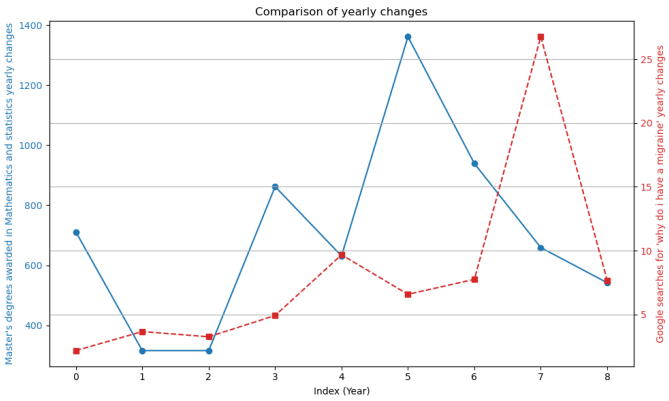

Figure 3: Year-over-year changes in Master's degrees in Math/Stats and Google searches for "why do I have a migraine"

4 Discussion

Several hypotheses could explain this correlation:

- Pursuing a Master's degree in Mathematics and Statistics induces migraines.
- Sufferers of migraines seek solace in rigorous mathematical study.
- This is all an elaborate prank by the universe.

Clearly, none of these should be taken seriously. Except maybe the last one.

5 Conclusion

Is this correlation real? Yes. Is it meaningful? No. Should you change careers or question your reality because of it? Absolutely. But more than anything, remember: correlation is not causation—but it sure is fun.

6 Acknowledgments

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References

[1] Vigen, T. (2024, February 13). *Master's degrees awarded in Mathematics and Statistics correlates with Google searches for "why do I have a migraine"*. Retrieved June 2, 2025, from https://web.archive.org/web/20250602220936/https://www.tylervigen.com/spurious/correlation/33216_masters-degrees-awarded-in-mathematics-and-statistics_correlates-with_google-searches-for-why-do-i-have-a-migraine

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