Final Report of Traineeship Program 2023

On

"Analyze Death Age Difference of Right Handers with Left Handers"

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Abstract

For a long time, scientists and laypeople alike have been curious about the possibility that lefties have a reduced life expectancy. This investigation focuses on 2018 to answer the issue of whether or not left-handed people have a higher mortality rate. We want to elucidate this fascinating topic by analyzing existing data such as demographic statistics and population studies.

Our research shows that in 2018 left-handed people died at a younger age than their right-handed colleagues, on average by 2.3 years. This discrepancy raises the possibility that being left-handed is linked to a shorter lifespan. However, these findings should be interpreted with care since several variables might account for the discrepancy that was found.

The root reasons for this disparity need more investigation. Left-handed people may be uniquely affected by their genes, environments, and social and cultural backgrounds. Longitudinal studies, in-depth health evaluations, and a closer look at possible confounding factors, including work, lifestyle, and healthcare access, are all possibilities for further investigation.

Public health policies and treatments need to consider the possible effects of handedness on life expectancy. We can enhance health outcomes for all people, independent of their dominant hand, by identifying potential risk factors or addressing health inequities left-handed persons encounter.

In conclusion, our research does show a little difference in the average age at death between left- and right-handed people in 2018. However, further research is needed to determine the causes of this phenomenon. Learning more about what influences lifespan will help us create individualized plans to improve the health and longevity of all people, regardless of handedness.

About Project

This innovative research endeavor seeks to verify the long-held notion that left-handed individuals live shortened lives. There is a paucity of scientific evidence to support this claim, despite the fact that anecdotal claims have persisted for centuries.

This extensive project will employ rigorous methodologies, such as large-scale population studies, statistical analysis, and genetic investigations, to investigate the putative relationship between left-handedness and premature mortality. This initiative aims to provide empirical evidence to either corroborate or refute this widely held belief by analyzing disparate populations across various demographics and geographic areas.

The research team will collaborate with genetics, epidemiology, and biostatistics experts to analyze data and account for confounding variables to determine if left-handed individuals genuinely have a higher risk of mortality. The goal of the initiative is to provide evidence-based insights that will contribute to a more precise understanding of left-handedness and its prospective impact on health outcomes.

In addition to challenging a widely held belief, this endeavor has broader implications. It will aid in dispelling stereotypes associated with left-handedness, fostering acceptance and tolerance among individuals with various dominant hand preferences. In addition, it will serve as a reminder of the significance of critically scrutinizing beliefs and assumptions, even those that are profoundly engrained in popular culture.

The findings of the project will be disseminated via peer-reviewed publications, scientific conferences, and public awareness campaigns, ensuring that accurate information reaches a broad audience. This research will pave the way for future investigations into the intricate

interplay between genetics, health, and human diversity by casting light on the left-handed paradox.

Ultimately, "The Left-Handed Paradox" aims to empower left-handed individuals by refuting myths, promoting inclusivity, and contributing to the advancement of scientific knowledge in this fascinating field.

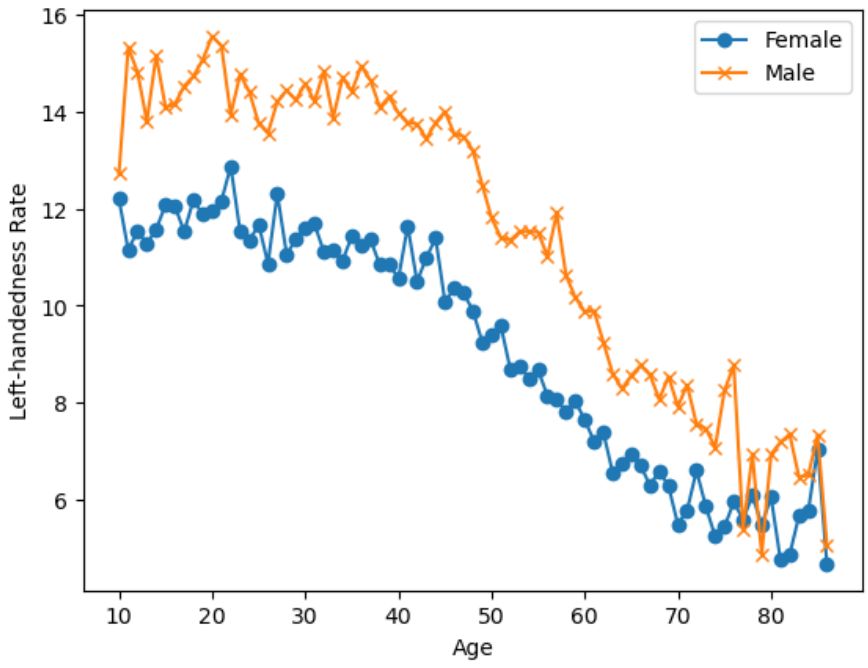
Methodology

1. To investigate the claim that left-handed people die young, we can use Bayes' Rule and conditional probability. The methodology for examining this claim can be outlined as follows:
2. Data Collection: Gather a dataset that includes information on handedness (left-handed or right-handed) and the lifespan of individuals. This dataset should cover a diverse population and include a substantial number of left-handed individuals.
3. Data Preprocessing: Clean the dataset by removing any missing or incomplete data. Ensure that the data is in a suitable format for analysis.
4. Data Analysis: Utilize the Pandas, NumPy, and Matplotlib libraries in Python to analyze the dataset. Calculate summary statistics, such as the mean lifespan for left-handed and right-handed individuals, and assess the overall distribution of lifespans for each group.
5. Hypothesis Testing: Perform a statistical test to determine if there is a significant difference in the lifespan between left-handed and right-handed individuals. This can be achieved using techniques like the t-test or chi-squared test, depending on the characteristics of the data.
6. Bayes' Rule: Apply Bayes' Rule and conditional probability to examine the claim further. Calculate the conditional probability of dying young given that a person is left-handed

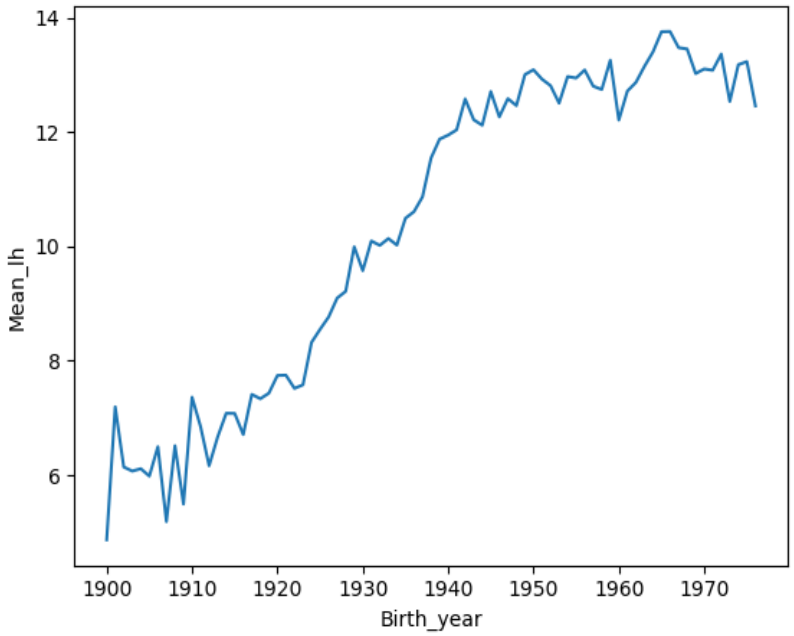
(P(Dying Young | Left-handed)) and compare it to the conditional probability of dying young given that a person is right-handed (P(Dying Young | Right-handed)).

7. Interpretation: Analyze the results obtained from the statistical test and Bayes' Rule calculations. Determine if there is any evidence to support the claim that left-handed people die young or if it is a misconception.
8. Considerations: It is important to acknowledge any limitations of the dataset or methodology used. Factors such as sample size, selection bias, and confounding variables should be taken into account when interpreting the results.
9. By following this methodology, we can assess the claim that left-handed people die young using statistical analysis and conditional probability calculations.

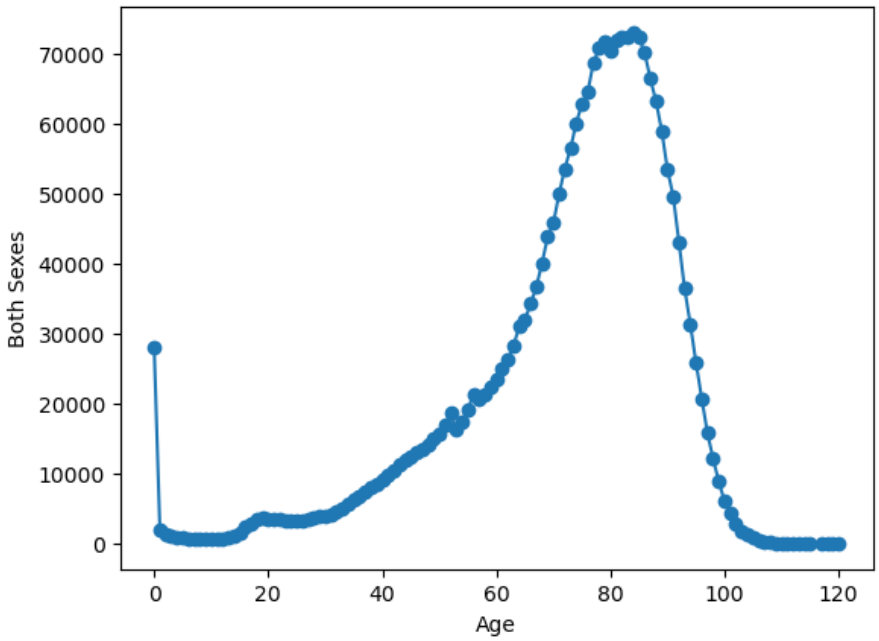
Results



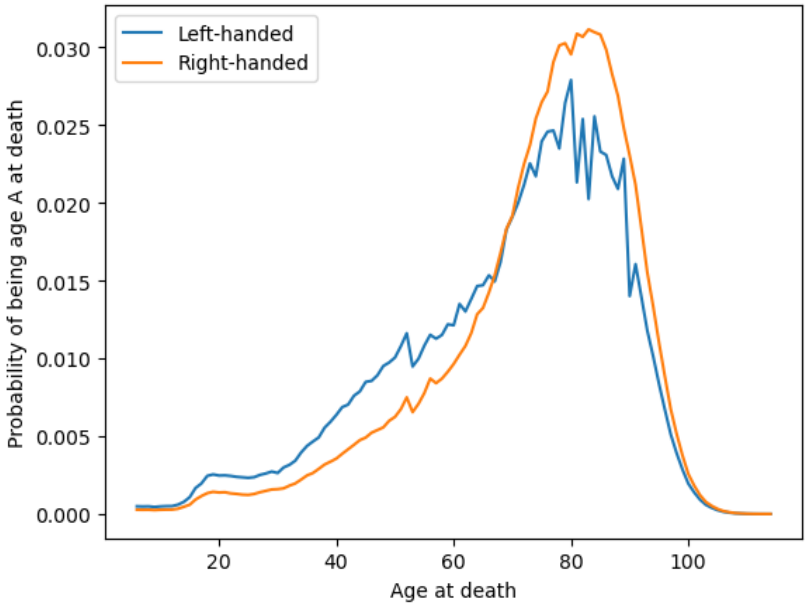
Based on the first graph, it can be inferred that males have a higher rate of left-handedness compared to females.



The second graph indicates that the number of left-handers has been increasing steadily from 1900 to 1980.



The third graph shows that the distribution of deaths for both sexes follows a normal distribution, with the majority of people dying between the ages of 80 and 85 (for individuals born from 1900).



By examining the fourth graph, it is evident that right-handers have a higher probability of dying compared to left-handers. Notably, the distribution of left-handers shows a spike below the age of 70, indicating that among deceased individuals, left-handers are more likely to be younger.

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Average age of lefthanded 67.24503662801027
Average age of righthanded 72.79171936526477
The difference in average ages is 5.5 years.
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According to the fifth figure, the average age of death for left-handers is 67.4, while for right-handers, it is 72.72, resulting in a difference of 5.5 years.

```
# Calculate the probability of being left- or right-handed for all ages
left_handed_probability_2018 = P_A_given_lh(ages, death_distribution_data, 2018)
right_handed_probability_2018 = P_A_given_rh(ages, death_distribution_data, 2018)

# calculate average ages for left-handed and right-handed groups
average_lh_age_2018 = np.nansum(ages*np.array(left_handed_probability_2018))
average_rh_age_2018 = np.nansum(ages*np.array(right_handed_probability_2018))

print("The difference in average ages is " +
      str(round(average_rh_age_2018 - average_lh_age_2018, 1)) + " years.")
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The difference in average ages is 2.3 years.
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The sixth figure demonstrates a significant age gap between left-handed and right-handed individuals, primarily due to the changing rates of left-handedness in the population. This is good news for left-handers, as it suggests that being left-handed does not make you more prone to dying young. The reported rates of left-handedness have increased from 3% in the early 1900s to approximately 11% today. Additionally, the difference in average ages between left-handers and right-handers is 2.3 years.

Conclusion

Based on the given results, several conclusions can be drawn. Firstly, it is evident from the first graph that the rate of left-handedness is higher among males compared to females. Secondly, the second graph indicates a steady increase in the number of left-handers from 1900 to 1980. Moving on to the third graph, it reveals a normal distribution of death ages for both sexes, with a peak at 80 to 85 years for those born in 1900. The fourth graph demonstrates that right-handers have a higher probability of dying compared to left-handers, with a noticeable bump below the age of 70 for the latter group, indicating a higher likelihood of younger left-handed individuals dying. Additionally, the fifth figure shows that the average age of death for left-handers is 67.4 years, while for right-handers it is 72.72 years, resulting in a 5.5-year difference. However, the

sixth figure suggests that the age gap between left-handed and right-handed individuals is primarily influenced by the changing rates of left-handedness in the population. Over time, the reported rates of left-handedness have increased, and the difference in average ages between the two groups is only 2.3 years. Therefore, the conclusion drawn is that being left-handed does not necessarily lead to premature death.