



# The Association Between Sibling Relationships and Academic Performance in the US

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## Introduction

- Despite the United States government spending \$200 billion in emergency federal spending to improve the education system, students are performing comparatively worse today compared to years past (Steiner, 2023).
- Previous research looks at at-home variables that impact academic success.
- Negative sibling relationships have negative associations with academic motivation and college GPA (Kraft et al., 2009).
- There is a positive association between receiving academic support from older siblings and improved academic achievement and motivation (Bouchey et al., 2010).

## Research Questions

- Is there an association between the quality of sibling relationships (positive, negative, and neutral) and how a student performs in school?
- Does this relationship differ between female and males?

## Methods

### Sample

- Respondents (n=1,242) were drawn from the US National Survey of Adolescent Health (ADDHEALTH), a nationally representative sample of adolescents in grades 7-12 from the 1994-1995 school year.

### Measures

- Individuals were asked to rate how often they fight with their sibling and how often they feel love for their sibling on a scale of 1 (very often) to 5 (never). They were asked to rate how often they spend time with their sibling on a scale of 1 (a lot) to 4 (none). These ratings were combined and categorized as positive, neutral, or negative **sibling relationships (SR)**.
- Individual's science, math, English, and history grades were summed and

then divided by 4 to quantitatively create the response variable of **academic performance (AP)**.

## Results

### Bivariate

- Analysis of Variance (ANOVA) revealed that SR and AP had a statistically significant association ( $p < 0.05$ ) where a positive SR resulted in a higher average AP.
- Post hoc ANOVA tests revealed that positive SR compared to negative and neutral SR were statistically significant ( $p < 0.05$ ) but neutral to negative SR was **not** statistically significant ( $p = 0.22$ ).

### Multivariate

- Linear regression showed that positive SR significantly increased AP by 0.26 ( $p < 0.05$ ) while neutral SR increased AP by 0.11, but this was not statistically significant ( $p = 0.10$ ).
- Gender is a statistically significant cofounder in this relationship. Being female has a positive association with AP and is predicted to increase AP by 0.32636 ( $p < 0.05$ ).

Figure 1: Sibling Relationship and Academic Performance

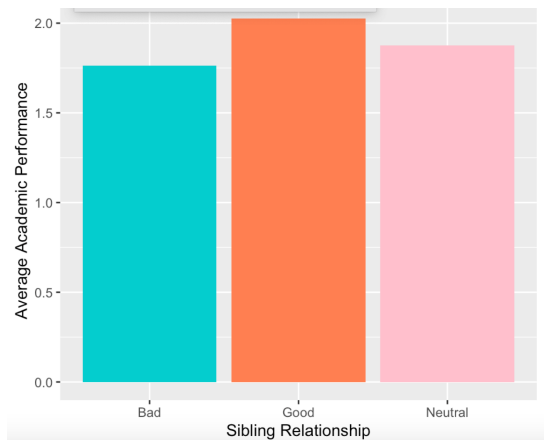
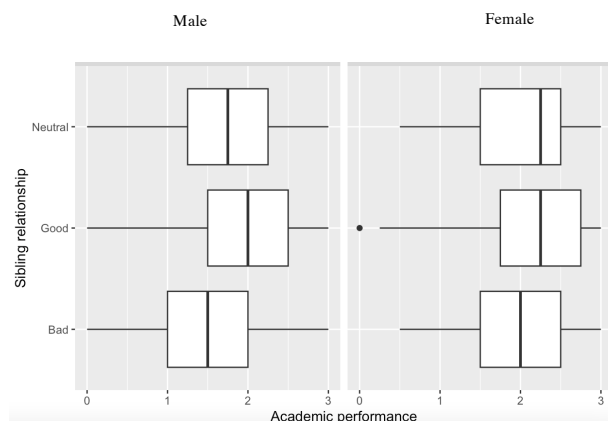


Figure 2: Sibling Relationship and Academic Performance based on Gender



## Discussion

- A positive SR is associated with individuals with higher APs while negative SR are associated with lower AP.
- These findings show that there are potential at-home variables that can improve individual's academic performance.
- Most research focuses on in-school variables, but these results could expand the scope of focus
- Further research is needed to look at other covariates to explore other at-home variables (family wealth, income, race, etc.) that could impact an individual's success in school.

## References

- Anderson, S. G. (2023, March 26). *U.S. Education Rankings Are Falling Behind the Rest of the World*. The Balance. Retrieved March 1, 2024, from <https://www.thebalancemoney.com/the-u-s-is-losing-its-competitive-advantage-3306225>
- Bouchey, H. A., Shoulberg, E. K., Jodl, K. A., & Eccles, J. S. (2010). Longitudinal Links Between Older Sibling Features and Younger Siblings' Academic Adjustment During Early Adolescence. *Journal of Educational Psychology, 102*(1), 197-211. <https://doi.org/10.1037/a0017487>
- Kraft, A., Stayton, C., Satyanarayan, A., & Luecken, L. J. (2009). *CHILDHOOD SIBLING RELATIONSHIP QUALITY AND ACHIEVEMENT OUTCOMES IN UNIVERSITY STUDENTS: MEDIATION BY PSYCHOLOGICAL DISTRESS AND PERSONAL MASTERY*. <Go to ISI>://WOS:000269273600009
- Steiner, D. (2023, July 20). *America's Education System Is a Mess, and It's Students Who Are Paying the Price*. The 74. Retrieved March 1, 2024, from <https://www.the74million.org/article/americas-education-system-is-a-mess-and-its-students-who-are-paying-the-price/>