* 1. Socioeconomic disparities have long been linked with unequal education outcomes. In identifying potential disparities and informing education policies, it is important to understand whether there is a measurable difference in school scores based on families' income levels. This study investigates whether income disparity is reflected by measurable unevenness in math scores, a critical question of inequity in education. For instance, Sirin (2005) indicates that socioeconomic factors influence academic performance to the extent that there are questions about equity in education. We might gain from this research an understanding of how income imbalances affect math education outcomes and thus lead to targeted interventions to close the gaps.
  2. The dataset used for this study was sourced from Kaggle and includes U.S. school data, including student demographics, academic performance, and socioeconomic variables. It gives a structured view of how family income relates to student math scores. This dataset is ideal for our research question since it contains the categorical and numerical variables useful in hypothesis testing. This sample size and variation provide a sound basis for drawing valid inferences regarding the relationship between income and math performance.
  3. Our research question is, "Is there a difference in the distribution of students' scores in math among family-income groups?" In this respect, we will conduct statistical tests using the Wilcoxon test with family income as an independent variable and student scores in math as dependent variables.
  4. The null hypothesis (H0) states that there is no significant difference in the distribution of student math scores across different family income levels. In contrast, the alternative hypothesis (H1) posits that there is a significant difference in the distribution of scores based on family income. As formally, H0 highlights that the distributions of math scores are equal across income groups, whereas H1 highlights that the distributions of math scores differ across income groups.

References

Sirin, S.R., 2005. Socioeconomic status and academic achievement: A meta-analytic review of research. *Review of educational research*, *75*(3), pp.417-453.