# ImpACT of Involutary Factors on Student Success

Jordan Hatter[1]

[1] Department of Economics & Finance, College of Business, Louisiana Tech University

## Question

Colleges throughout the nation request standardized test scores to be disclosed whether that be SAT or ACT test scores. For some schools, these scores impact acceptance. For many, these scores constitute the awarding and amount of scholarships.

With the importance of these scores to many students, I intend to identify the significance, if any, of various involuntary factors for students. Some automatically assume economic status has an impact on student success, but I want to know if there are other factors at play. To complete this, I ask the following questions:

- To what extent does being economically disadvantaged impact ACT test scores?
- What other demographic factors affect scores?
- Does the student-teacher ratio have an effect at this scale?

## Methods

- Model 1, as seen in Table 1 as (1), accounts for only the percent of students who were economically disadvantaged in a parish. All other factors are held in the error term.
- Model 2, as seen in Table 1 as (2), adds more demographic factors to the previous equation. These student based factors include the race (Non-White), language proficiency (FullyEngProf), and gender (Female).
- Model 3, as seen in Table 1 as (3), adds the Student-Teacher Ratio to the previous model. This is a school based factor. Model 3 is represented by the following regression equation:

$$ACTScore_i = \beta_0 + \beta_1 DisAdv_i + \beta_2 NonWhite_i + \beta_3 FullyEngProf_i + \beta_4 Female_i + \beta_5 STRatio_i + \epsilon_i$$

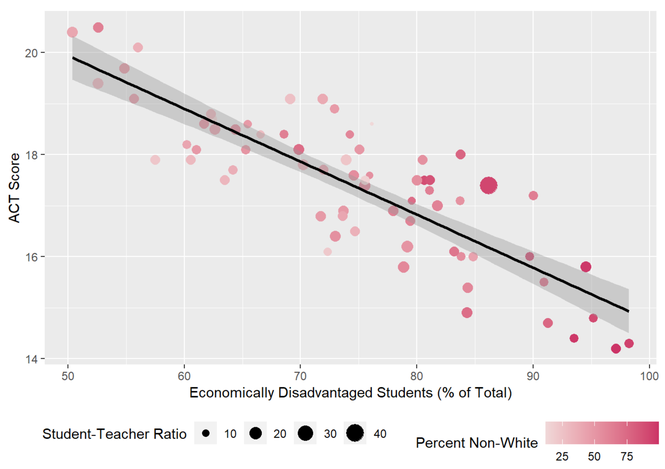


Figure 1: Average Composite ACT Scores

## Data

The data used for this project comes from the Louisiana Department of Education. I combine the Class of 2022 ACT score, 2021-2022 Actual Public Classroom Teacher Salary by School District, October 2021 Multi Stats, and February 2022 Multi Stats school system level data to create a cross-sectional data set.

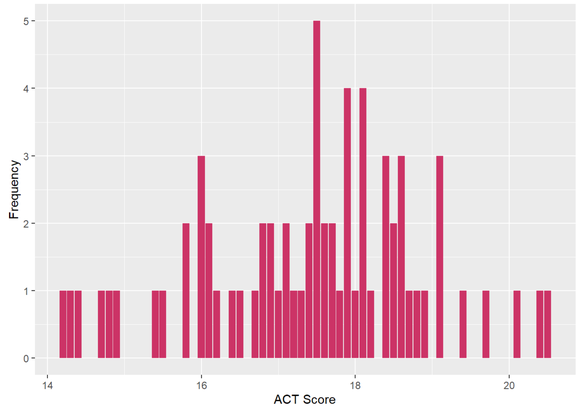


Figure 2: Histogram - Average Composite ACT Score

The data set can be replicated by completing the following actions:

1. Average the Total Enrollment, Minority (Non-White), Percent Female, Percent Fully English Proficient, and Percent Economically Disadvantaged from the October 2021 Multi Stats and February 2022 Multi Stats data
2. Divide Non-White by total enrollment to get it as a percentage of students
3. Multiply all percentages by 100
4. Divide enrollment by the employment headcount from the salary data

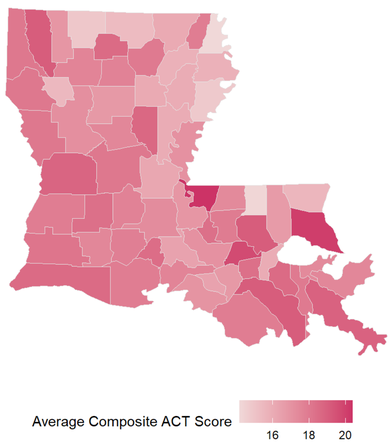


Figure 3: ACT Scores at the Parish Level

## Results

**Table 1: OLS Regression**

| | *Dependent variable:* | | |
|---|---|---|---|
| | ACT Score | | |
| | (1) | (2) | (3) |
| Economically Disadvantaged | -0.104*** | -0.104*** | -0.104*** |
| | (0.008) | (0.011) | (0.011) |
| Non-White | | -0.002 | -0.002 |
| | | (0.006) | (0.006) |
| Fully English Proficient | | -0.122*** | -0.122*** |
| | | (0.033) | (0.033) |
| Female | | -0.063 | -0.063 |
| | | (0.114) | (0.115) |
| Student-Teacher Ratio | | | 0.003 |
| | | | (0.025) |
| Constant | 25.142*** | 40.244*** | 40.163*** |
| | (0.614) | (6.505) | (6.604) |
| Observations | 69 | 69 | 69 |
| $R^2$ | 0.707 | 0.761 | 0.761 |
| Adjusted $R^2$ | 0.703 | 0.746 | 0.742 |
| Residual Std. Error | 0.783 (df = 67) | 0.724 (df = 64) | 0.730 (df = 63) |
| F Statistic | 161.966*** (df = 1; 67) | 50.987*** (df = 4; 64) | 40.161*** (df = 5; 63) |
| *Note:* | | | *p<0.1;* ***p<0.05;*** p<0.01 |

- In all three models the amount being Economically Disadvantaged lowers test scores is statistically significant.
- Of the additional demographic factors, being Fully English Proficient is the only one statistically significant.

## Conclusion

Being Economically Disadvantaged lowers test scores, but that is not the only factor.

A higher level of English Proficiency actually results in a lower average composite ACT score for a school system.

At the parish level, the Student-Teacher Ratio is not statistically significant.