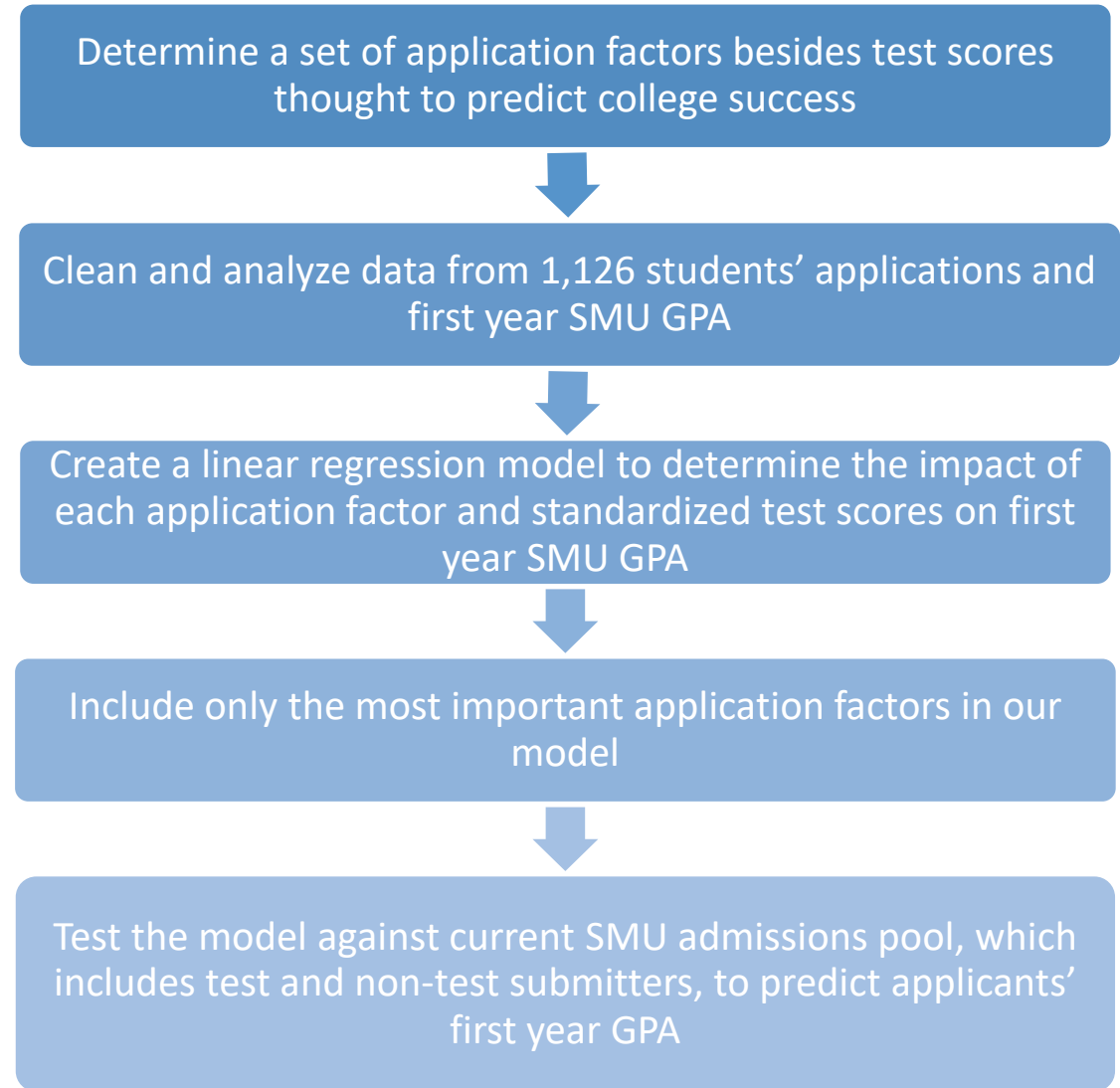# Admissions Test-Optional Modeling

Due to the global pandemic of 2020, many higher educational institutions decided to offer a test-optional admissions policy for the Fall 2021 admissions class.

Historically, test scores add 15% predictive power in determining students' college performance.

Our goal was to create an admissions rating model that will allow SMU to predict students' college performance with or without the presence of standardized test scores.

Determine a set of application factors besides test scores thought to predict college success

↓

Clean and analyze data from 1,126 students' applications and first year SMU GPA

↓

Create a linear regression model to determine the impact of each application factor and standardized test scores on first year SMU GPA

↓

Include only the most important application factors in our model

↓

Test the model against current SMU admissions pool, which includes test and non-test submitters, to predict applicants' first year GPA

Original Linear Regression Model

- Predicting SMU GPA
- Dataset: all application factors and **academic interest categories (STEM, Business, Social Sciences, Arts & Language, Audition Required, and other)**

Step Model

- Insignificant variables removed
- Significant variables include:
    - Sex
    - GPA rating
    - Cumulative GPA
    - Standardized Test Scores
    - Percentage of college degrees by zipcode
    - **Projected Business major**
    - **Ratio of # AP courses offered versus # taken**
    - **Student media interest**
    - **Academic honor program interest**

```
Residual standard error: 0.1219 on 742 degrees of freedom
Multiple R-squared:  0.8942,    Adjusted R-squared:  0.8914
F-statistic: 313.6 on 20 and 742 DF,  p-value: < 0.00000000000000022
```

Step Model Without Test Scores

- Significant variables include:
    - Sex
    - GPA rating
    - Cumulative GPA
    - Percentage of college degrees by zipcode
    - **Projected Business major**
    - **Ratio of # AP courses offered versus # taken**
    - **Student media interest**
    - **Academic honor program interest**

```
Residual standard error: 0.1226 on 743 degrees of freedom
Multiple R-squared:  0.8927,    Adjusted R-squared:  0.89
F-statistic: 325.3 on 19 and 743 DF,  p-value: < 0.00000000000000022
```

Box Plot of High School vs College Performance by Major
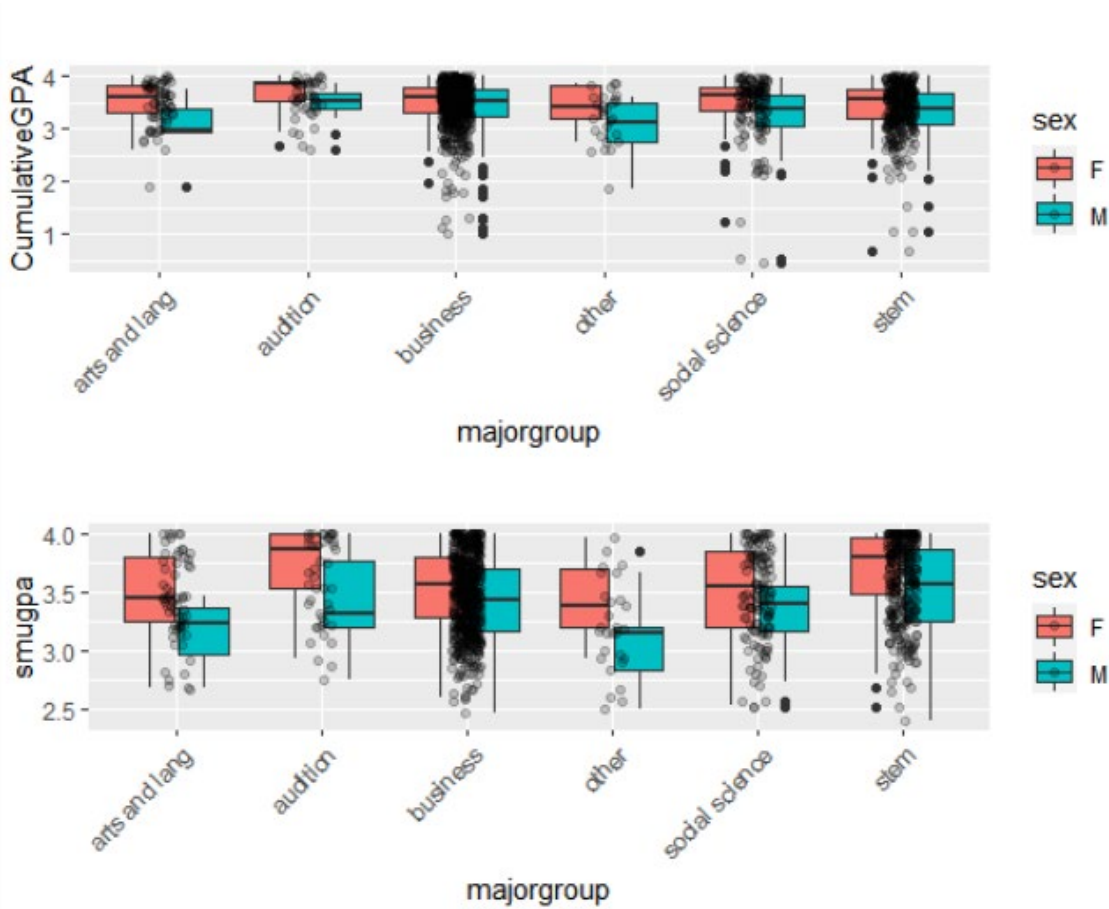
Marginal Density Plot between High School and College Performance by Major