

How to House Hunt: A Novel Analysis of Physical Attributes Influencing Sale Price in Ames, Iowa 2006-2010

S.Ho, S.Kim, S.Yoon, M.Stier

Emory University, Department of Quantitative Theory and Methods



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Introduction

- House prices have been growing rapidly year by year. According to Zillow, the typical American home price increased by 13.2% compared to last year.¹
- Before the internet was created, there was a massive information gap between professionals and home buyers. Now, thanks to the internet, information about houses for sale is widely available to consumers.
- According to past studies, the key factors to consider when pricing a home are quality of the neighborhood, the size and appeal of the houses, the age, and the condition of houses.²
- Other studies in the past have analyzed the surprising difference between self reported and market based home appraisals -- our research will help to bridge the gap between the two as the information gap has shrunk with the internet.³

Objective

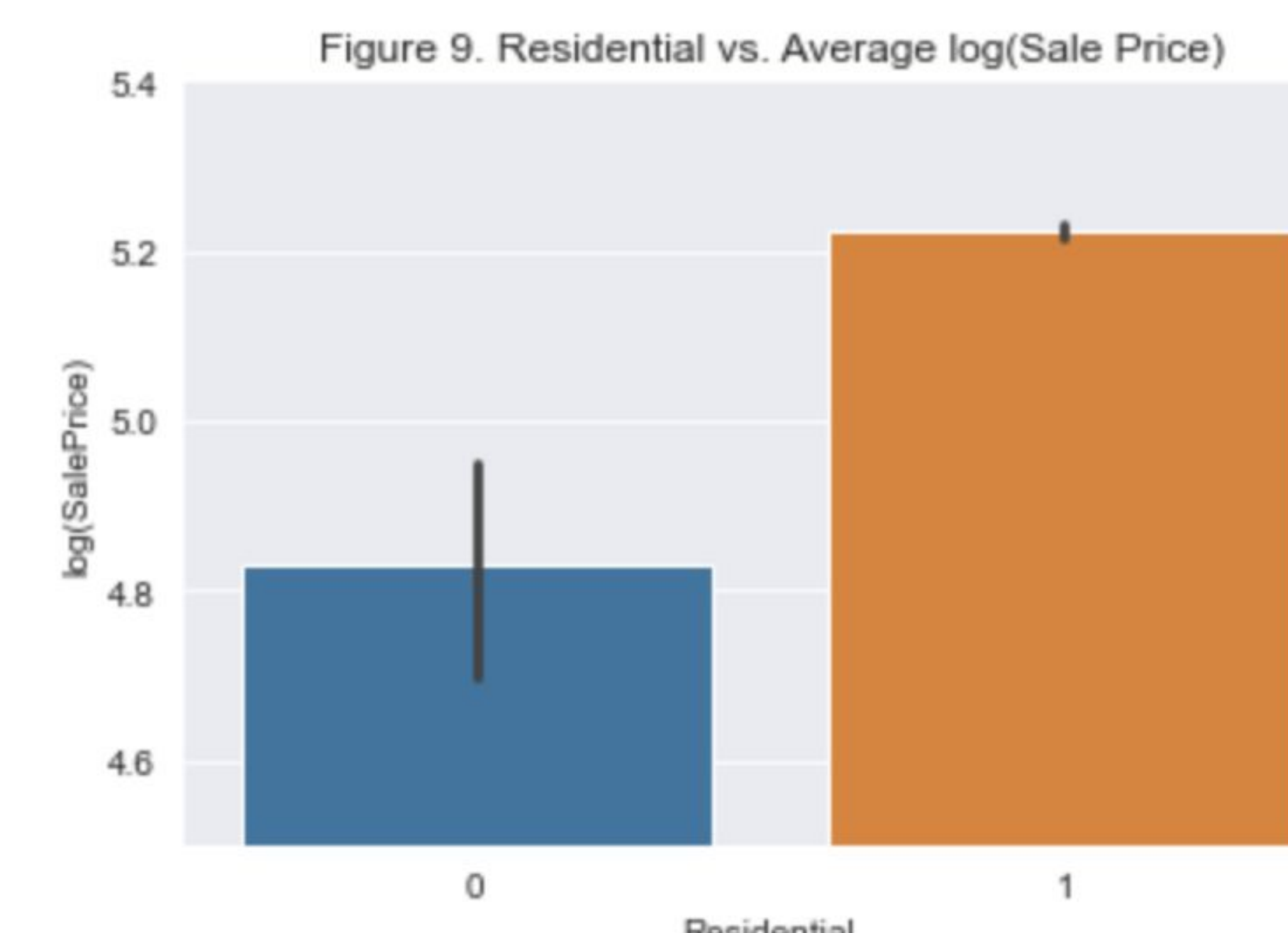
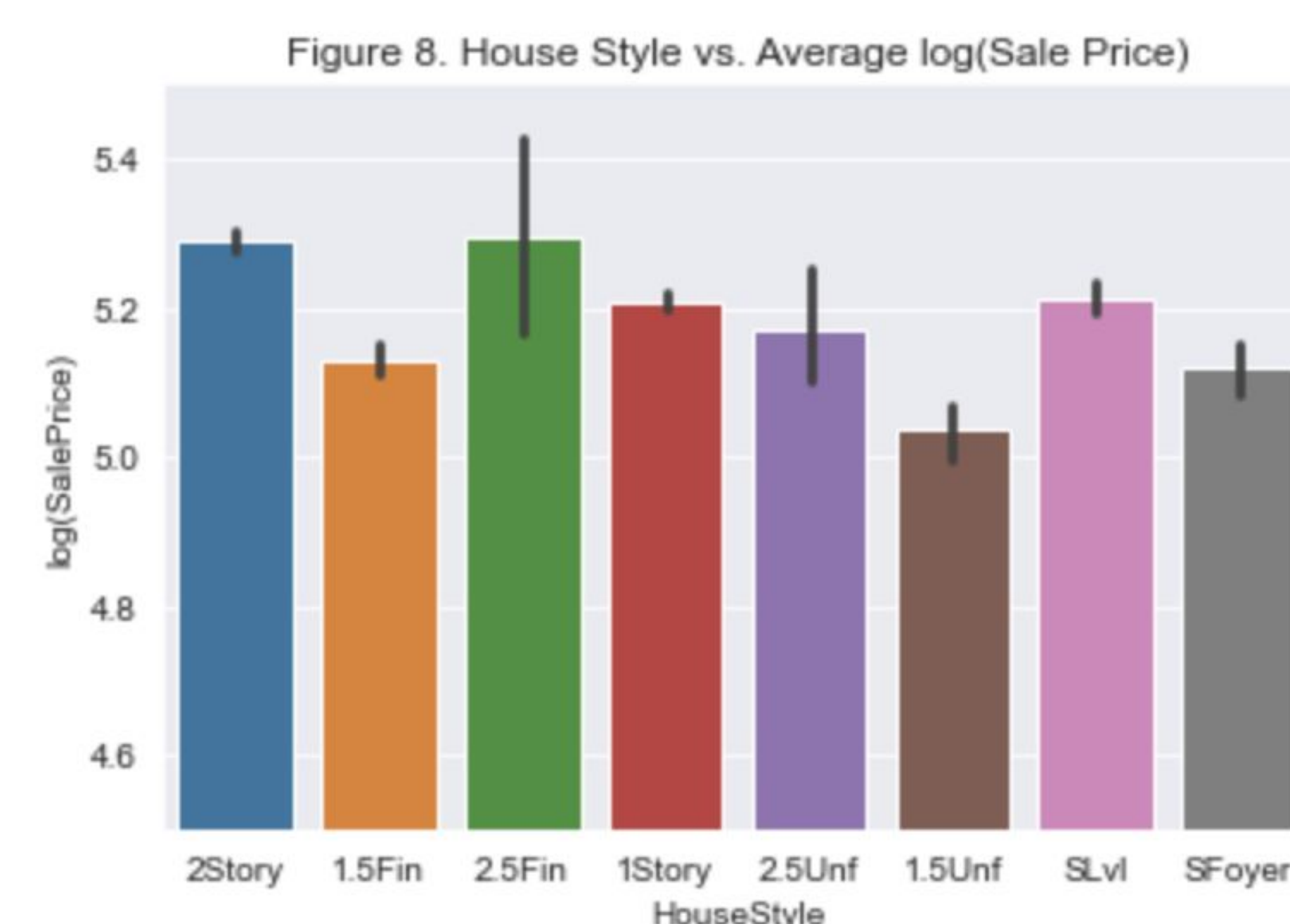
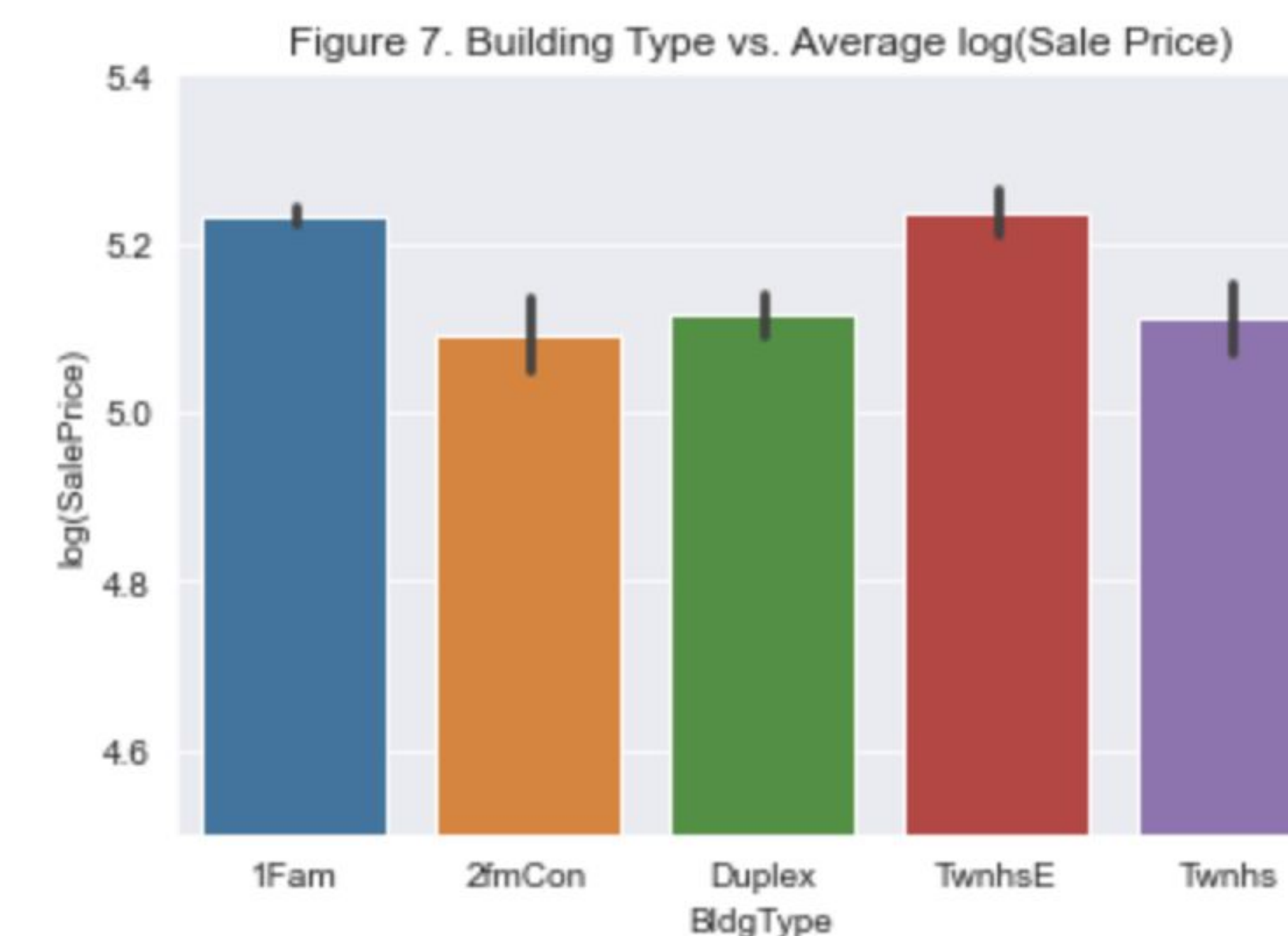
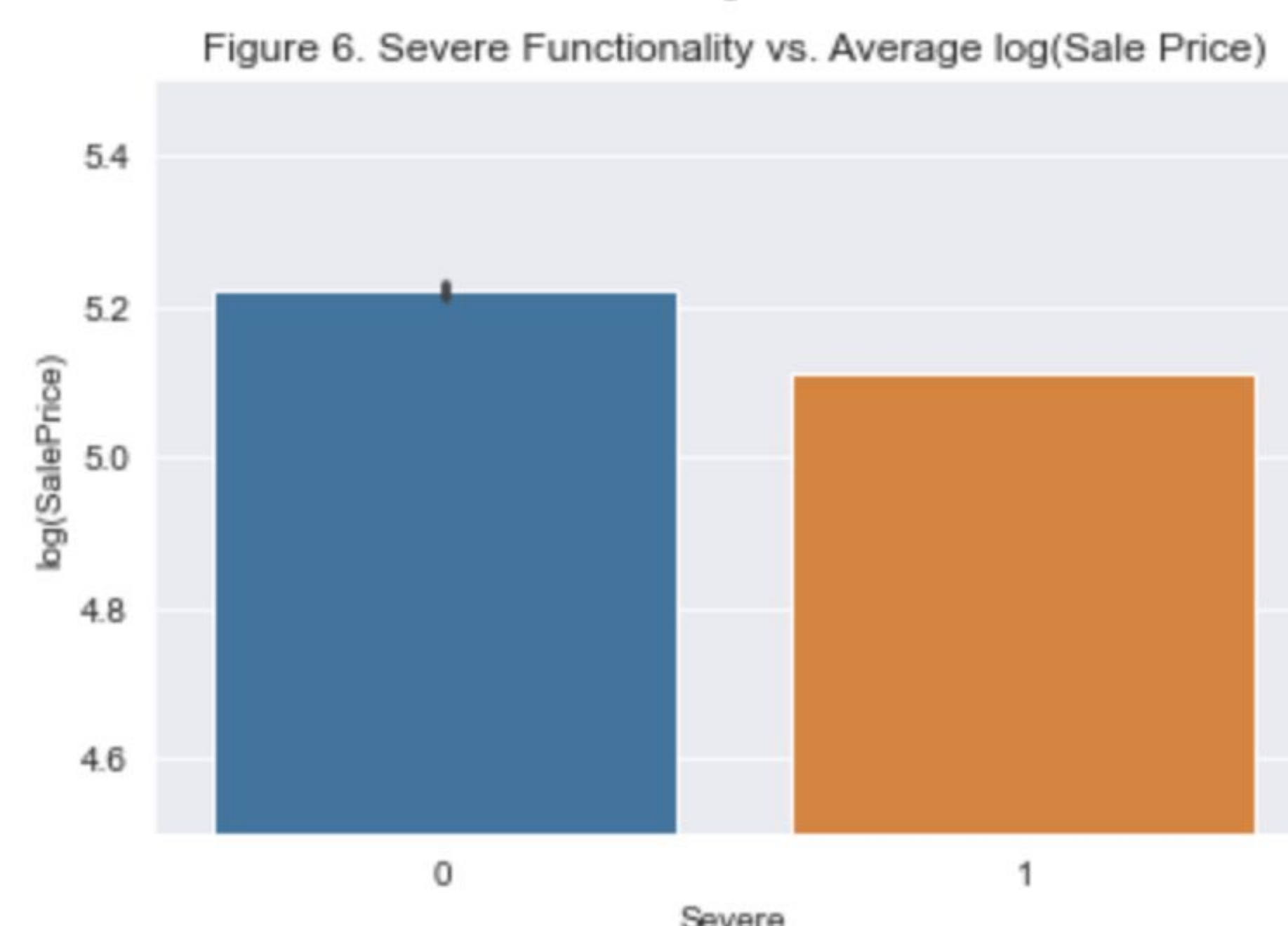
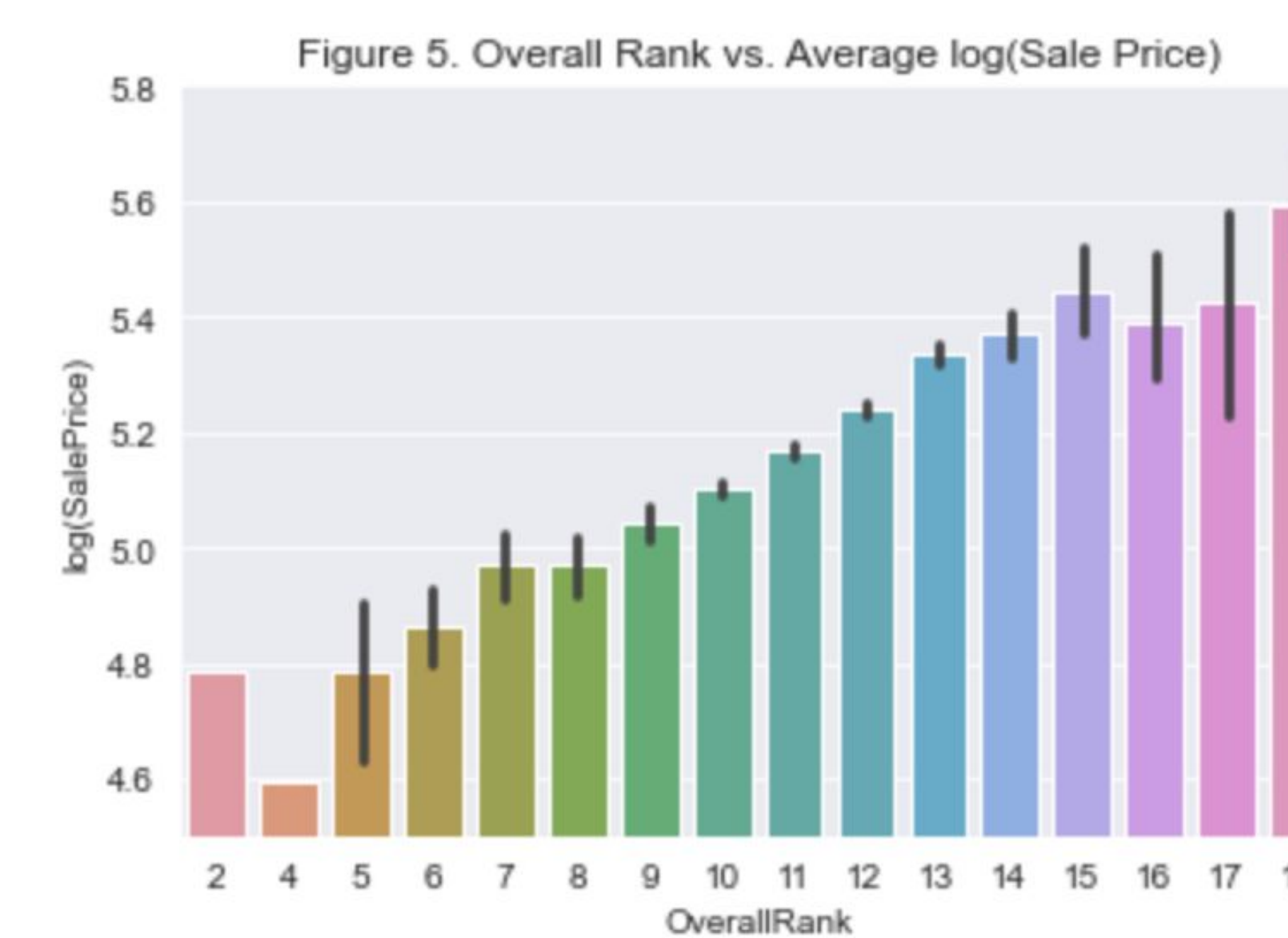
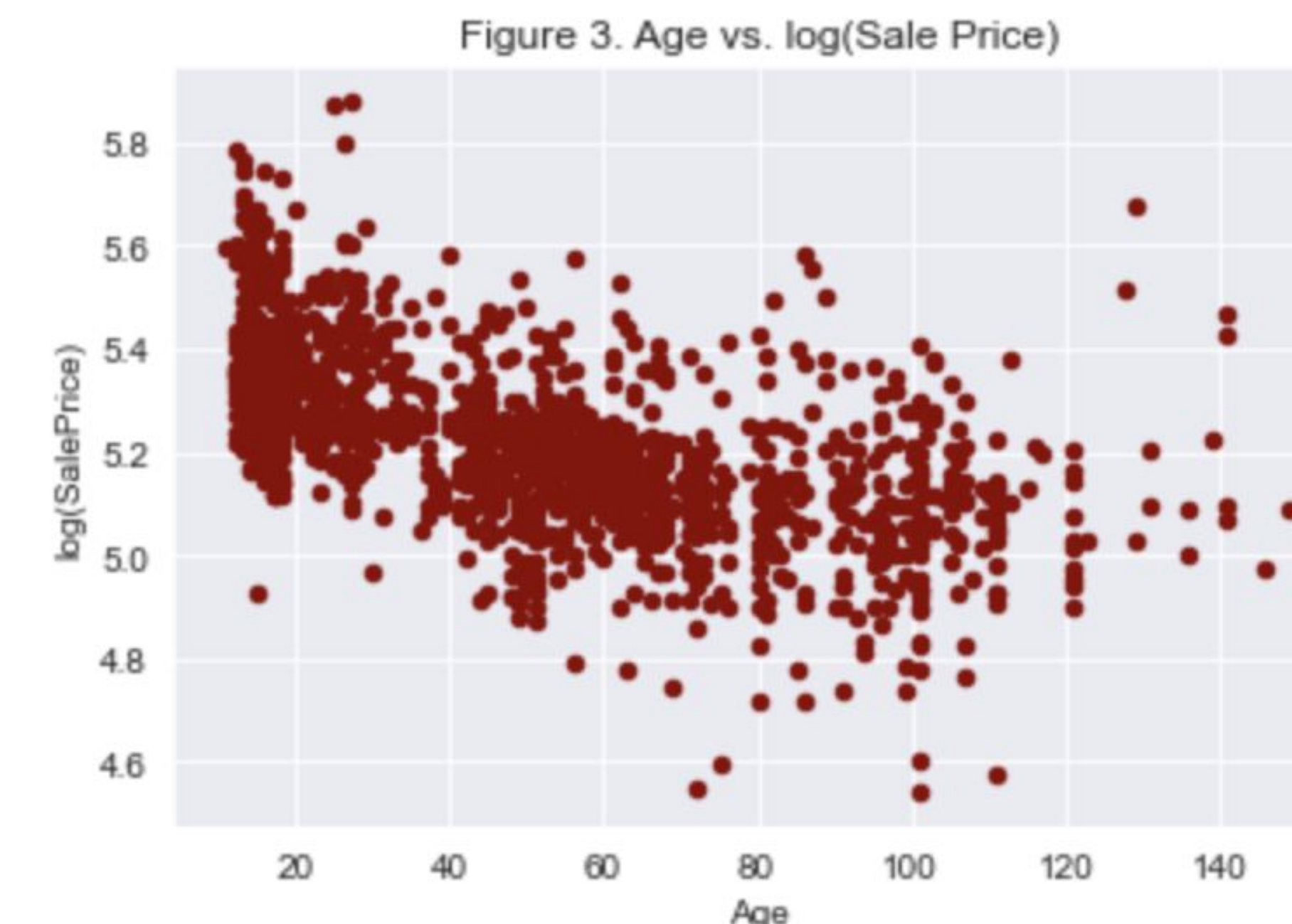
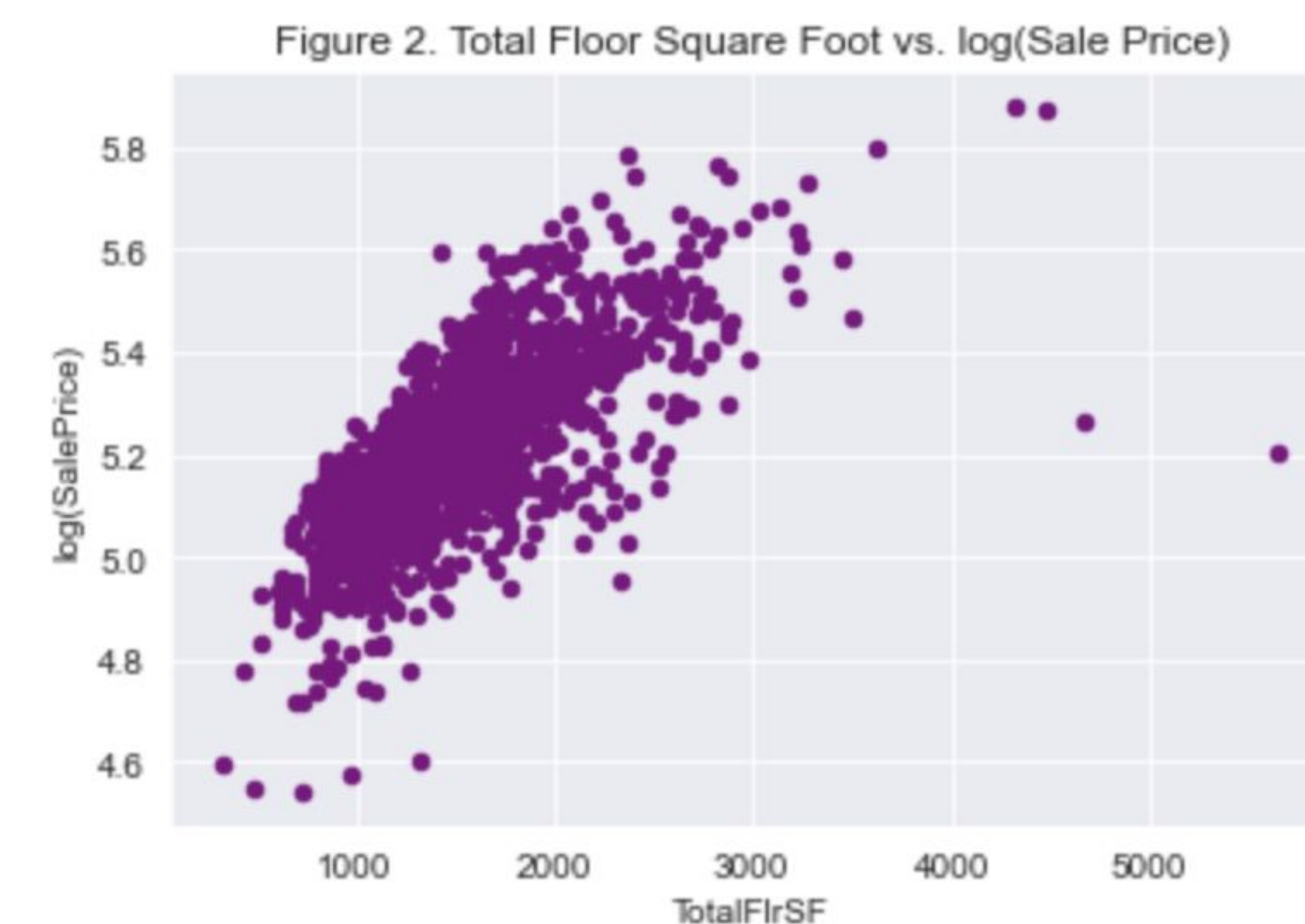
- We examined the impact of house size, garage area, age, building class, general zone classification, type of dwelling, style of dwelling, and overall quality and rating have on the price of a house.
- This examination provides insights that may serve as a foundation for prospective homeowners' house hunt.

Data and Methods

- Our research used a dataset collected by kaggle.com which contained information on 2,919 residential home property sales that occurred in Ames, Iowa between 2006 and 2010.
- Our outcome variable was the sale price. Our predictors included twelve dichotomous variables created from eight exposure variables based on physical attributes of the house.
- We conducted a multiple linear regression to determine if any of our predictors had a significant impact on sale price.



Figure 1: Data Reduction Diagram



Results

- Independent variables accounted for 83.52% of the variance in sale price.
- All eight variables were significant with at least $p < 0.05$
- Average residential properties cost 46.67% more than non residential properties when all other variables are held constant.
- The effect of minor deduction, the effect of building type for two family homes, and the effect of house style for split house did not have a statistically significant impact on sale price.

Conclusion

- Our findings support our hypothesis: a majority of the variables we identified as most likely to be influential had statistically significant effects on sale price.
- As the age of the home increases, the sale price decreases, and as quality and condition ratings increase, the sale price increases.
- As the severity of deductions increases, the house will require more renovations, which would decrease the price significantly.
- Although the effect of garage area and total floor square footage were significant and positively associated with sale price, the estimated effect is small, so there is little practical significance

Applications

- When considering our results, it is important to note that our confounders may affect sale prices differently in bigger cities, other parts of the country, or in different time periods.
- One surprising finding was that buying a home with more than one story would be less expensive than one with a single story.
- Our dataset did not include interest rates or the condition of the housing market, which other studies have identified to be also significant determinants of sale price (Chan, 2016).
- One suggestion for future studies is to look at the same confounders decade over decade for 50 or 60 years. This will allow us to contextualize the real estate market and highlight trends that may be occurring over time.

References

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