TIPPING BEHAVIOR ANALYSIS

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INTRODUCTION

RESEARCH PURPOSE

- Tipping is essential income for workers in many restaurants
- Growing global conflict: tipping norm vs forced tipping culture
- Customers often unsure about appropriate tip

RESEARCH QUESTIONS

- What is a reasonable tip amount?
- What types of customers tend to tip more?

For this analysis, three R packages were used: ggplot2, dplyr, and scales (Wickham 2023; Wickham et al. 2023; Wickham, Seidel, and Dunnington 2023).

DATASET SUMMARY

Data source: 244 restaurant transactions from a U.S. restaurant (Badole 2024)

VARIABLES

- **total_bill**: total cost of the meal ($)
- **tip**: tip amount ($)
- **sex**: gender of the customer (Male of Female)
- **smoker**: smoker or non-smoker (Yes or No)
- **day**: day of visit (Thursday to Sunday)
- **time**: time to visit the restaurant (Lunch or Dinner)
- **size**: number of people at the table

RESEARCH QUESTION 1

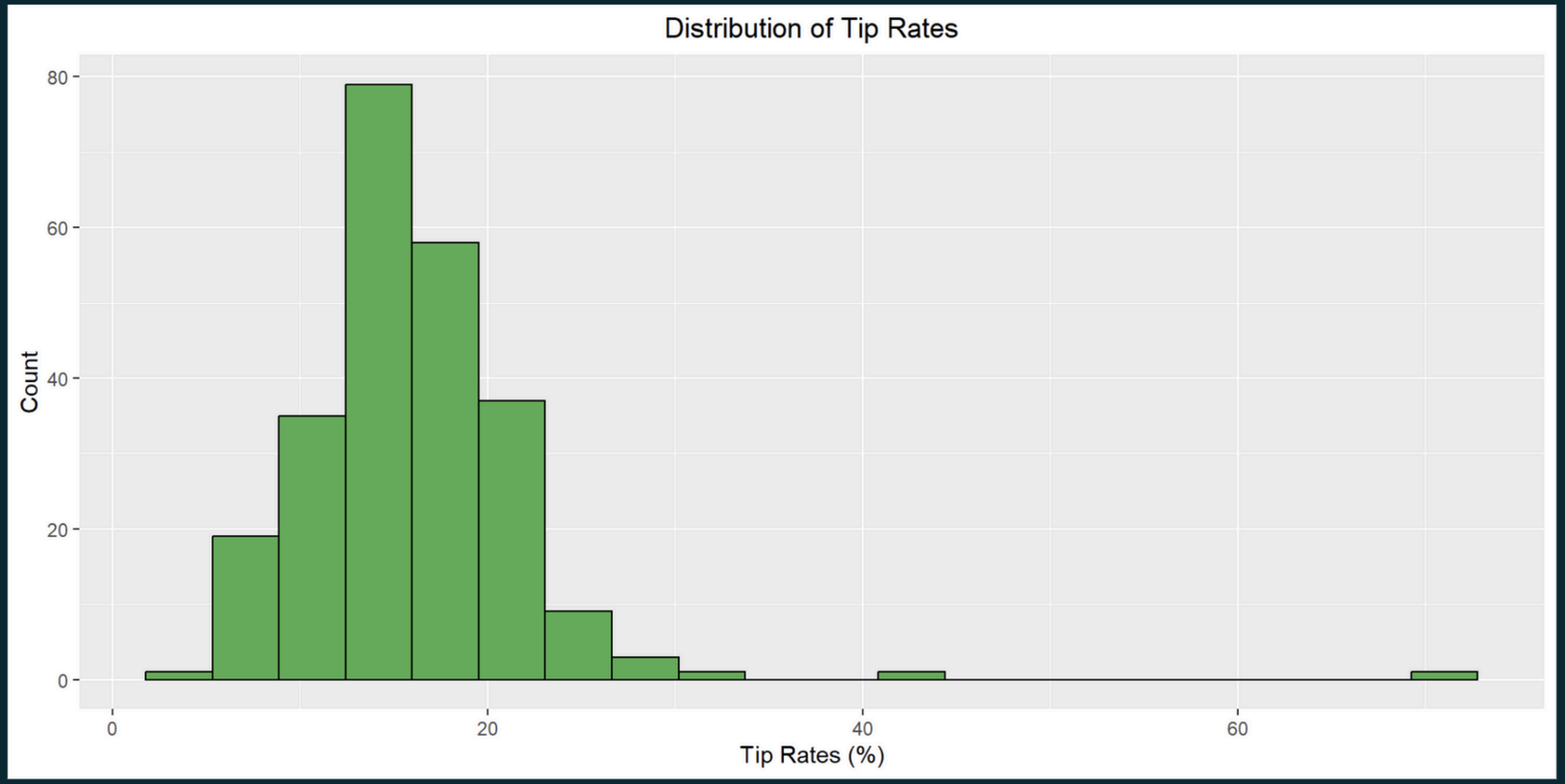
WHAT ARE TYPICAL TIP RATES?

When you tip at restaurants, what percentage feels “normal” to you? The data will reveal what most people really do.

TIP RATES DISTRIBUTION

Summary Statistics of Tip Rates (%)

Min	Q1	Median	Mean	Q3	Max
3.56	12.91	15.48	16.08	19.15	71.03



FINDINGS

- Average tip rate ≈ **16%**
- Median tip rate ≈ **15.5%**
- **Typical tip rate range: 13% – 19%**

INTERPRETATION

Most customers tend to leave tip rates between 13% and 19%.

RESEARCH QUESTION 2

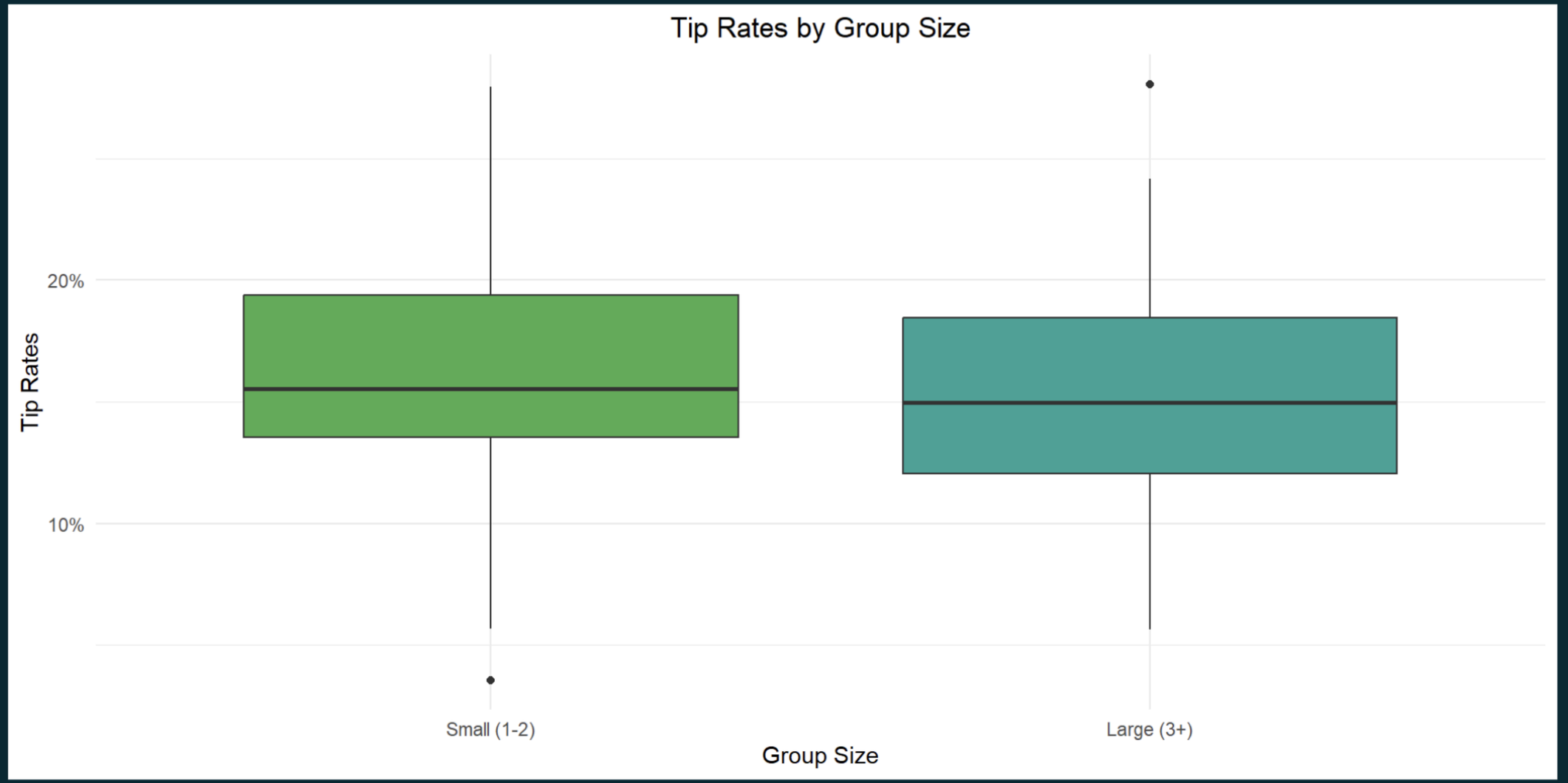
To ensure a more accurate analysis, outliers were removed based on abnormal tip rates.

1. TIP RATES BY GROUP SIZE

We often assume that large groups at restaurants are associated with celebrations. It seems reasonable to expect that they might tip more due to a fest atmosphere. But, is this actually true?

Tip Rates by Group Size

group_type	count	tip_rates_mean	tip_rates_median
Small (1-2)	156	16.0	15.5
Large (3+)	84	14.9	15.0



FINDINGS

- Small groups tend to leave slightly higher tip rates than large groups.
- However, the difference is not statistically significant (p-value > 0.05).

INTERPRETATION

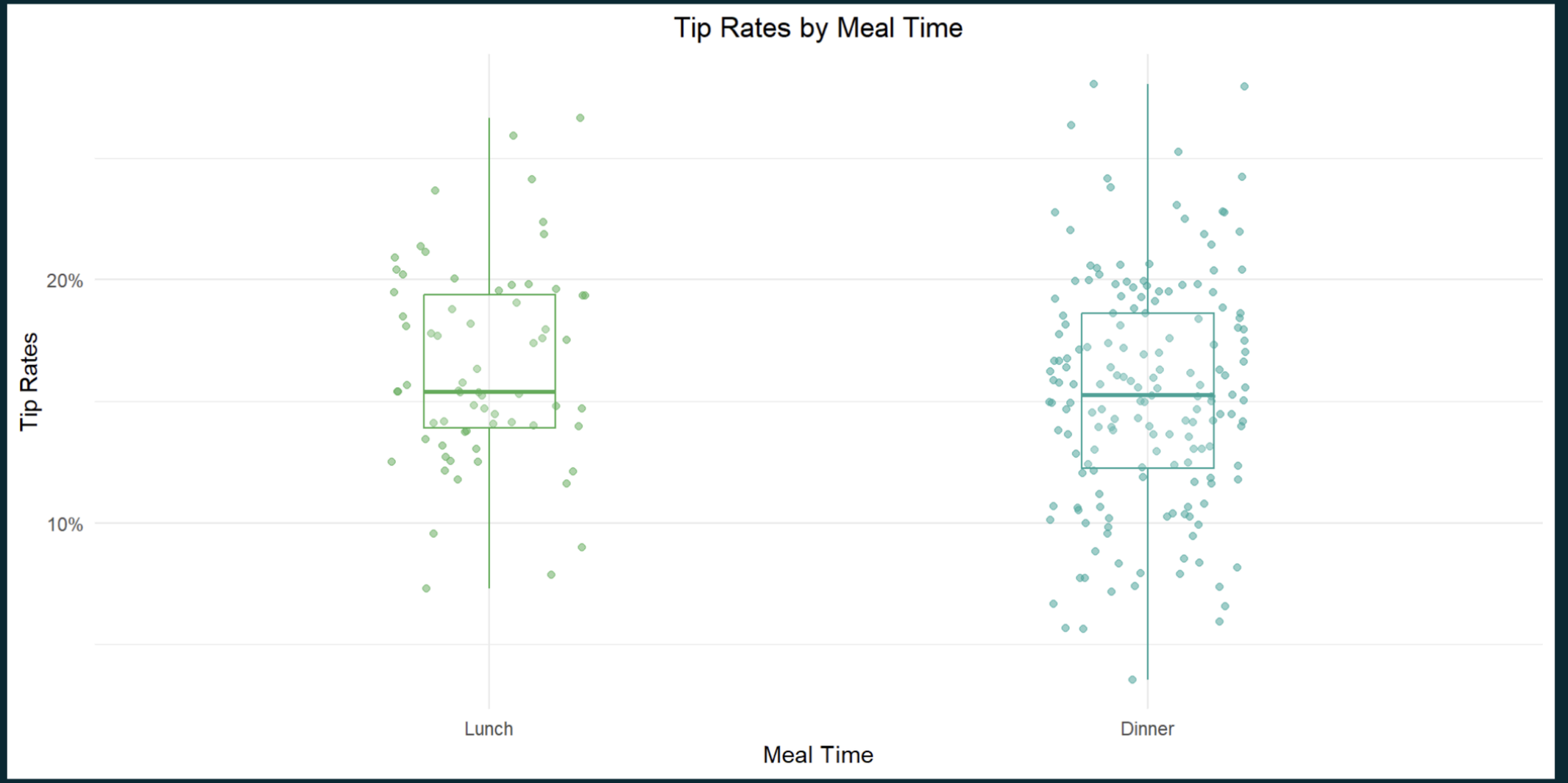
Group size does not have a meaningful impact on tip rates in this dataset.

2. TIP RATES BY MEAL TIME

Do you think meal time (lunch or dinner) influences tipping behavior? It is not obvious, but dinner customers might leave higher tips since dinner is typically a more relaxed and social occasion compared to lunch.

Tip Rates by Meal Time

Meal Time	Count	Mean Tip Rates	Median Tip Rates
Lunch	68	0.164	0.154
Dinner	172	0.153	0.152



FINDINGS

- Lunch customers tend to leave slightly higher tip rates than dinner customers.
- However, the difference is not statistically significant (p-value > 0.05).

INTERPRETATION

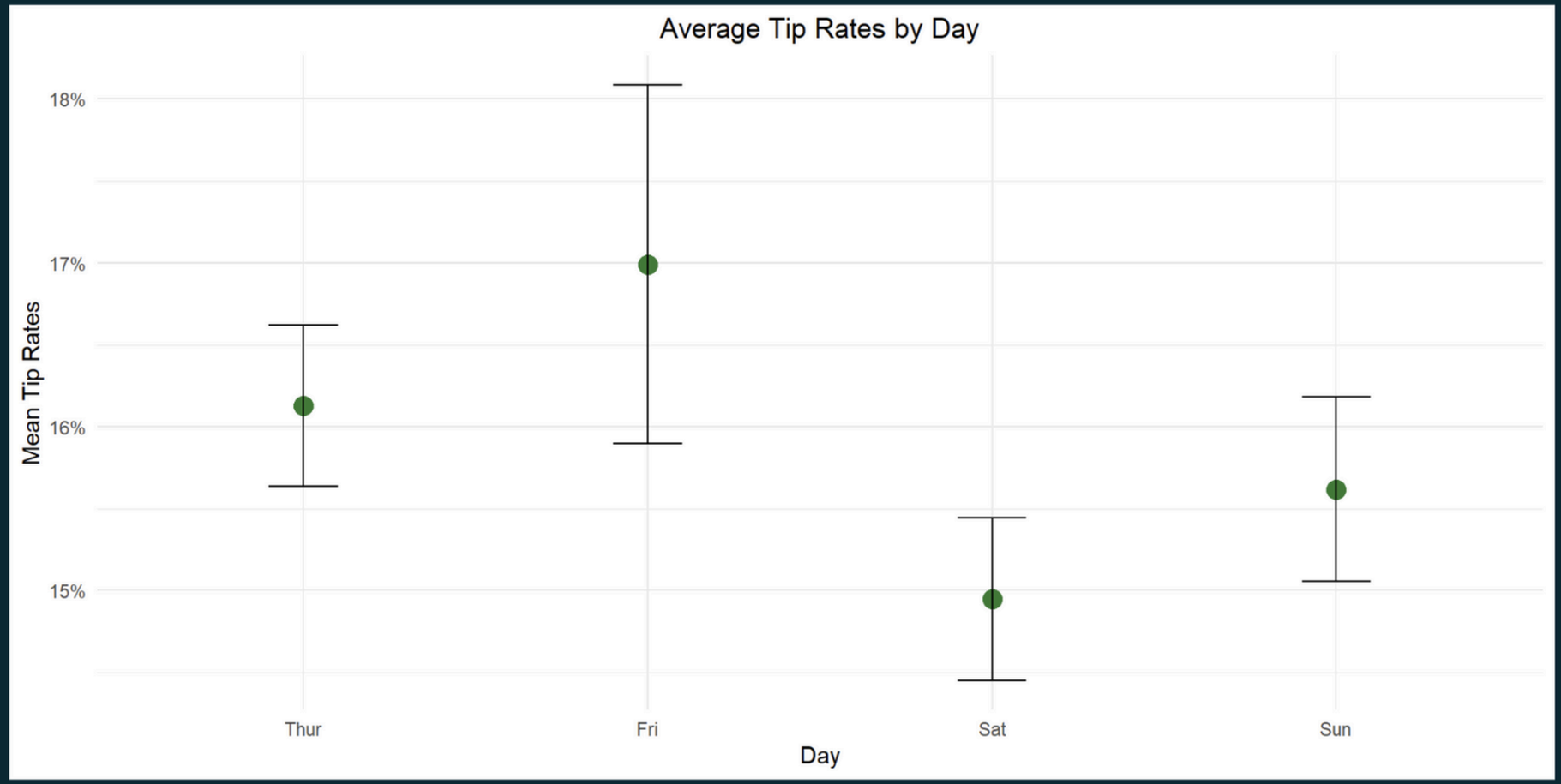
Meal time does not have a meaningful impact on tip rates in this dataset.

3. TIP RATES BY DAY

For most people, Friday might be the happiest day of the week since it is the beginning of the weekend. It is reasonable to expect that customers might leave higher tips on Fridays since the atmosphere is more relaxed and social compared to other days. Does the data support this expectation?

Tip Rates by Day

Day	Count	Mean Tip Rates (%)	Median Tip Rates (%)
Thur	62	16.13	15.38
Fri	19	16.99	15.56
Sat	85	14.95	15.02
Sun	74	15.62	15.96



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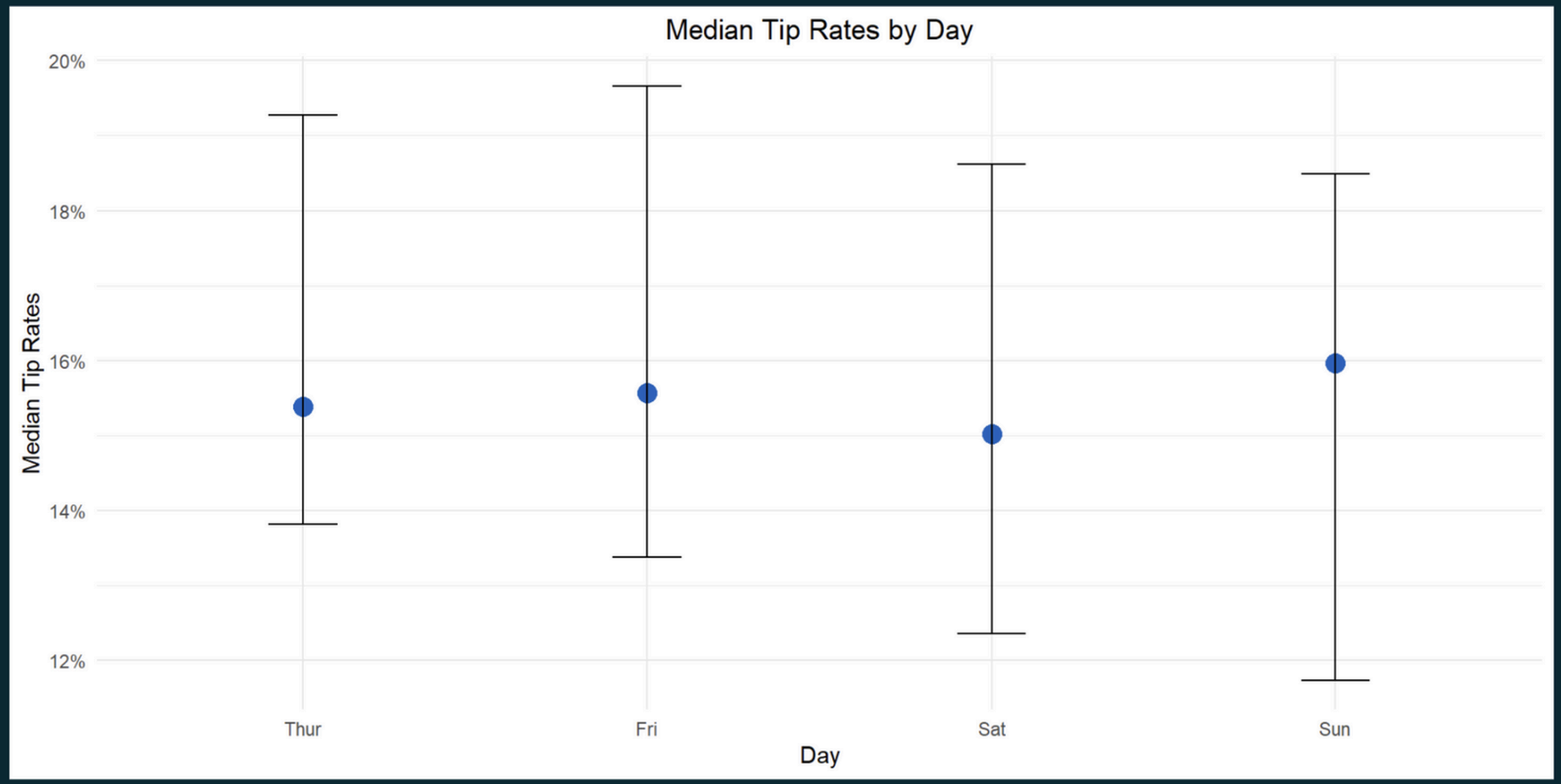


FINDINGS

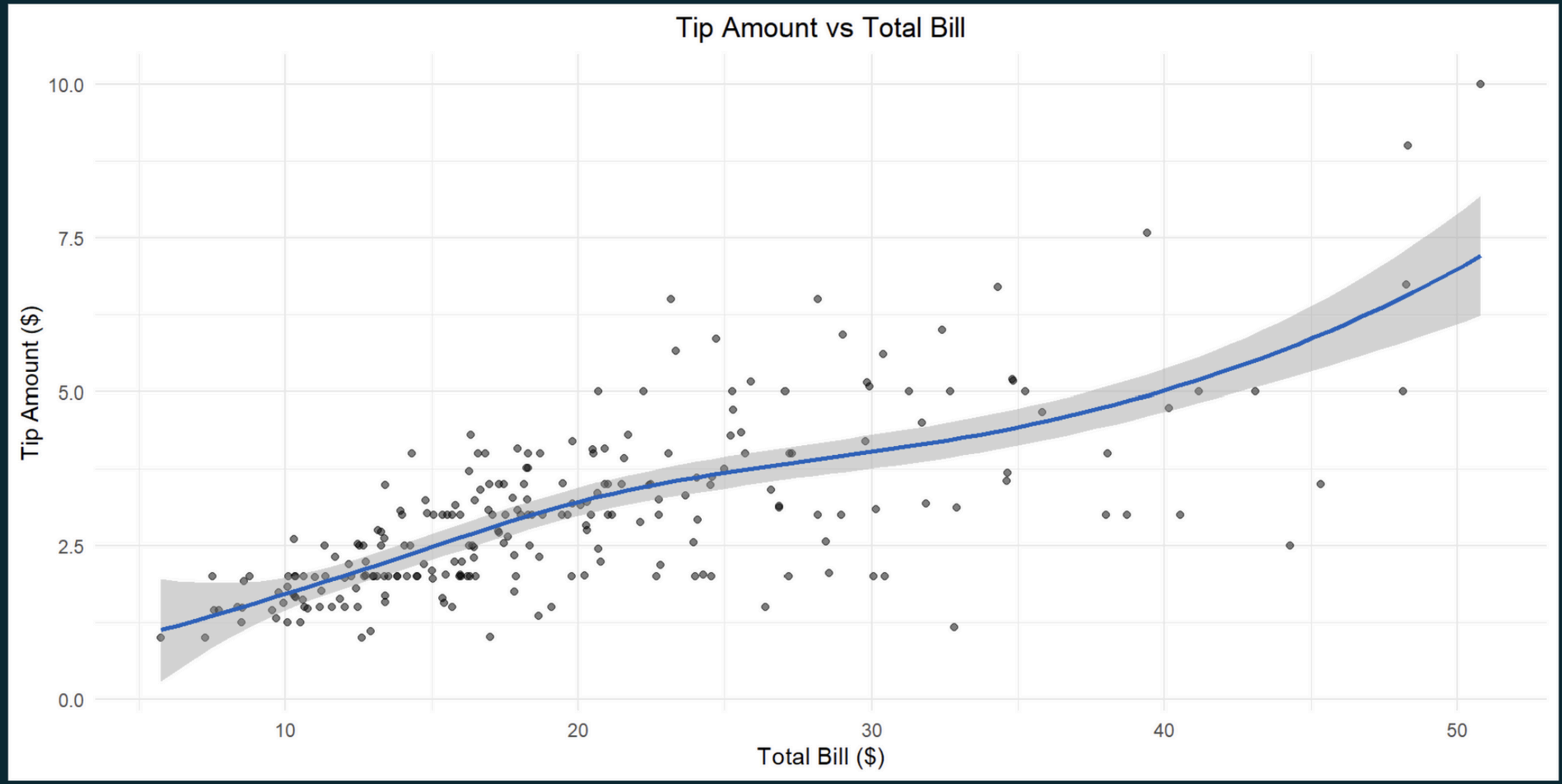
- Customers tend to leave higher tip rates on average, and there are occasional big tippers on Fridays.
- Sundays show relatively stable and consistent tipping behavior with a higher median tip rate.
- Saturday shows the lowest average and median tip rates among all days.
- However, the difference is not statistically significant (p-value > 0.05).

INTERPRETATION

Day does not have a meaningful impact on tip rates in this dataset.

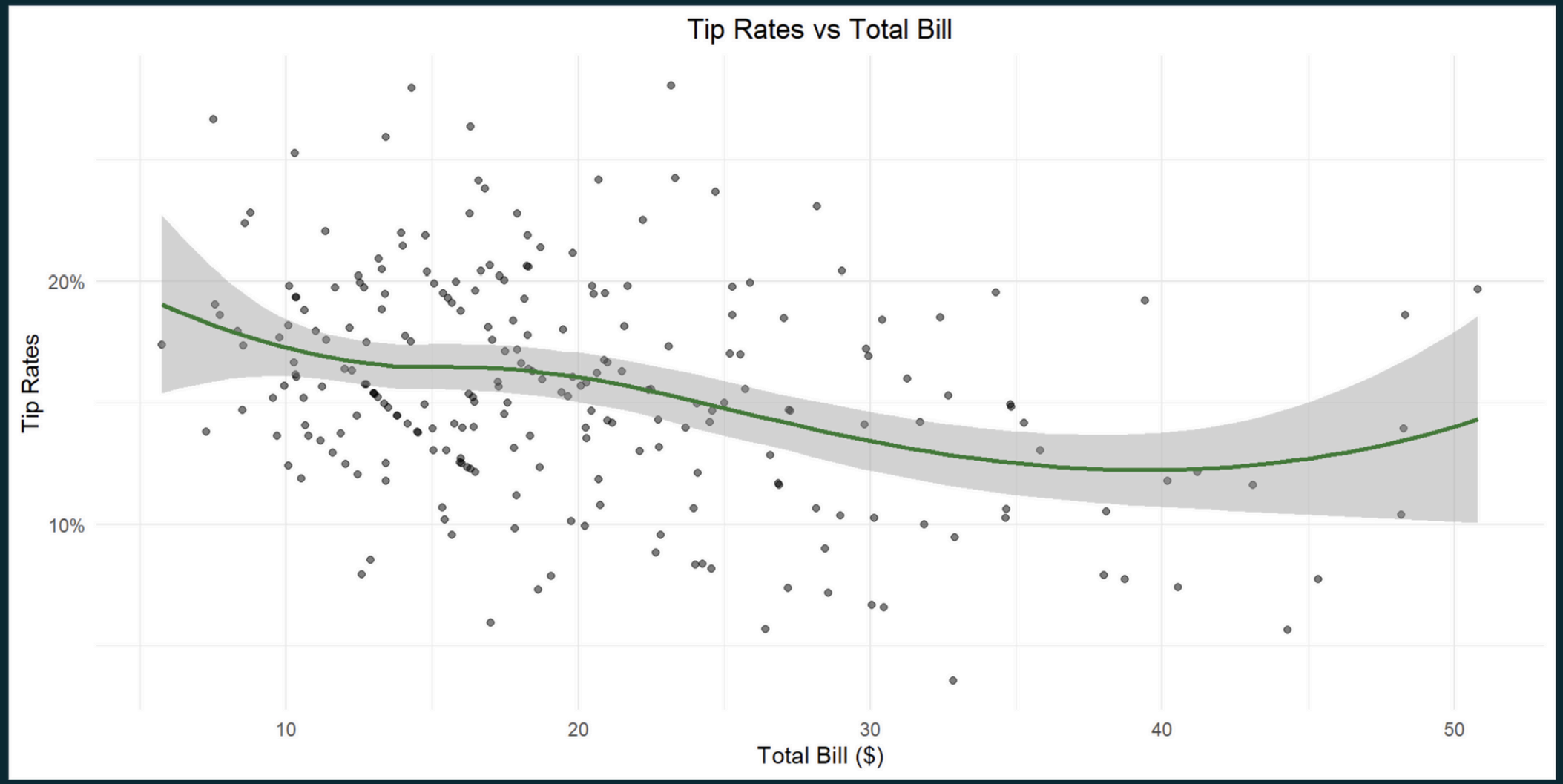
4. TIP RATES AND TOTAL BILL

Many people might assume that customers who spend more on their meals tend to leave higher tip rates. It seems reasonable since they might be more generous tippers. Let’s look at the data to find out whether this expectation holds true.


Tip Amount vs Total Bill
Tip Amount ($)
10.0
7.5
5.0
2.5
0.0
10
20
30
40
50
Total Bill ($)

Tip Rates by Total Bill

Bill Group	Count	Mean Tip Rates (%)	Median Tip Rates (%)
Low Bill	120	16.68	15.96
High Bill	120	14.56	14.69



FINDINGS

- Tip amounts increase as total bills increase.
- Tip rates do not increase with spending and instead show a non-positive relationship.
- Low bill customers tend to leave higher and more consistent tip rates than high bill customers.
- The difference is statistically significant (p-value < 0.05).

INTERPRETATION

Customers who spend less on their meals tend to leave higher tip rates consistently than customers who spend more.

CONCLUSION

- Typical tipping rates range from approximately 13% to 19%.
- Lower-spending customers tend to leave higher and more consistent tip rates.
- Group size, meal time, and day of the week do not show statistically meaningful differences in tipping rates in this dataset.
- However, this does not imply that these factors have no influence on tipping behavior.

SUPPORTING EVIDENCE FROM RESEARCH

- Tipping behavior is influenced more by customer characteristics such as income (Fernandez et al. 2024).
- Tipping behavior is not determined solely by spending level and may reflect social norms and status-seeking motivations (Lynn 2025).

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