Project Title

A STAT 139 Final Project

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Abstract

Introduction

- Obesity is an exerbating problem in the US.
- Explore the association of 21 different factors with bmi, 13 of which are behavior-related factors such as the typical number of hours sleep per night

Methods

- Data description
- data source is NHANES 2013-2014
- Variables of interest
- Only consider adults of age 20 or above
- Data preprocessing & assumptions
- Merge data by participant sequence number
- Exclude don't know/refused/missing values — discuss implications in limitations
- Perform EDA
- Fit regression models
- Check assumptions

Results

Exploratory Data Analysis

Limitations

Conclusions

Appendix

Appendix I: Data preprocessing

```
##
## Attaching package: 'dplyr'
```

```
## The following objects are masked from 'package:stats':
##
```

```
##     filter, lag
```

```
## The following objects are masked from 'package:base':
##
##     intersect, setdiff, setequal, union
```

```
##         gender            age           race            edu       marriage
##              0              0              0              0              0
##        famsize      famincome    alcohol12yr     alcoholfrq        grocery
##              0              0              0              0              0
##         eatout       delivery           milk  meals_nothome meals_fastfood
##              0              0              0              0              0
##      depressed  sleep_trouble       activity         tv_hrs       sleep_hr
##              0              0              0              0              0
##          smoke            bmi      bmi_class
##              0              0              0
```

```
##         gender            age           race            edu       marriage
##       "factor"      "integer"       "factor"       "factor"       "factor"
##        famsize      famincome    alcohol12yr     alcoholfrq        grocery
##      "integer"       "factor"       "factor"      "integer"      "integer"
##         eatout       delivery           milk  meals_nothome meals_fastfood
##      "integer"      "integer"       "factor"      "integer"      "integer"
##      depressed  sleep_trouble       activity         tv_hrs       sleep_hr
##       "factor"       "factor"       "factor"       "factor"      "integer"
##          smoke            bmi      bmi_class
##       "factor"      "numeric"    "character"
```

Appendix II: Exploratory Data Analysis

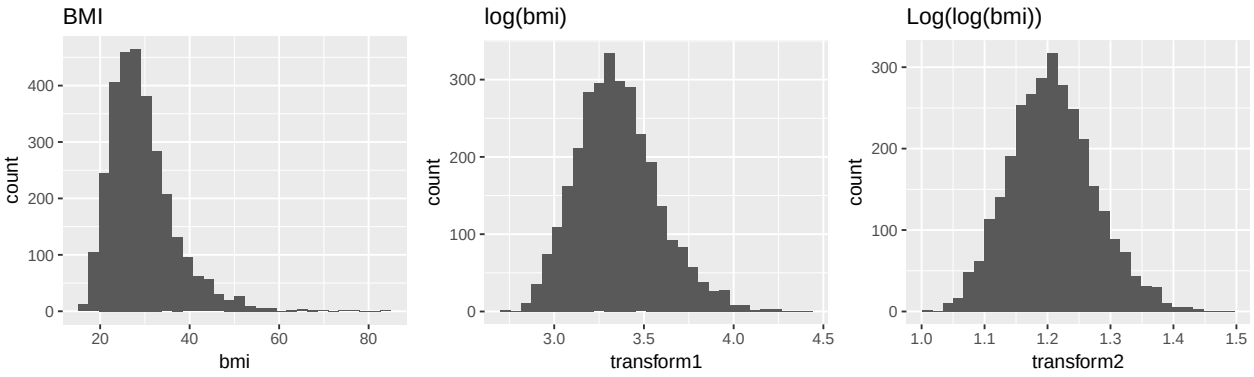
Response Variable (bmi)

```
## Loading required package: gridExtra
```

```
##
## Attaching package: 'gridExtra'
```

```
## The following object is masked from 'package:dplyr':
##
##     combine
```

```
## `stat_bin()` using `bins = 30`. Pick better value with `binwidth`.
## `stat_bin()` using `bins = 30`. Pick better value with `binwidth`.
## `stat_bin()` using `bins = 30`. Pick better value with `binwidth`.
```



Predictor Variables

Numeric Variables

Distribtuion of numeric variables

```
## `stat_bin()` using `bins = 30`. Pick better value with `binwidth`.
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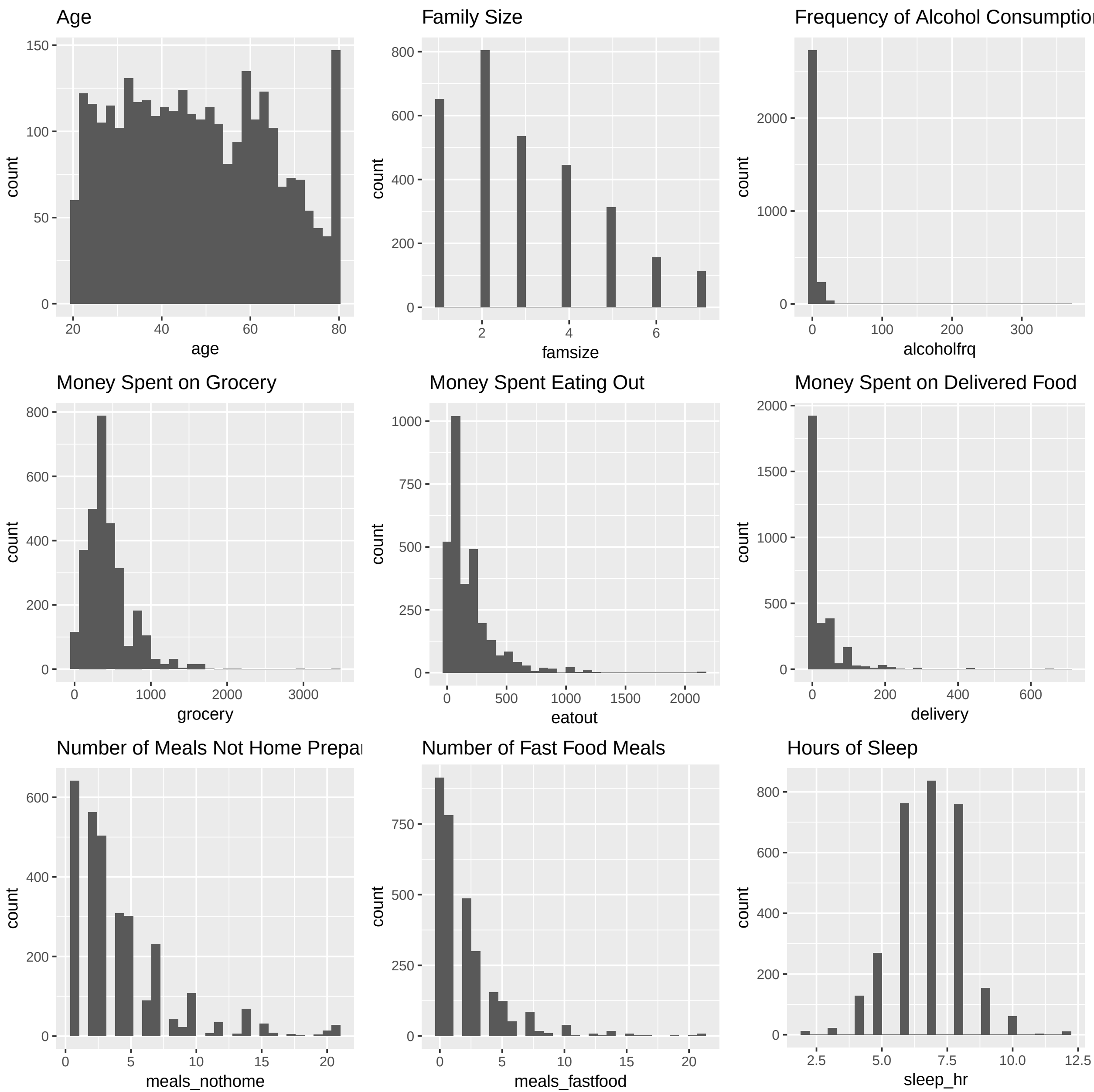
```




```
## `stat_bin()` using `bins = 30`. Pick better value with `binwidth`.
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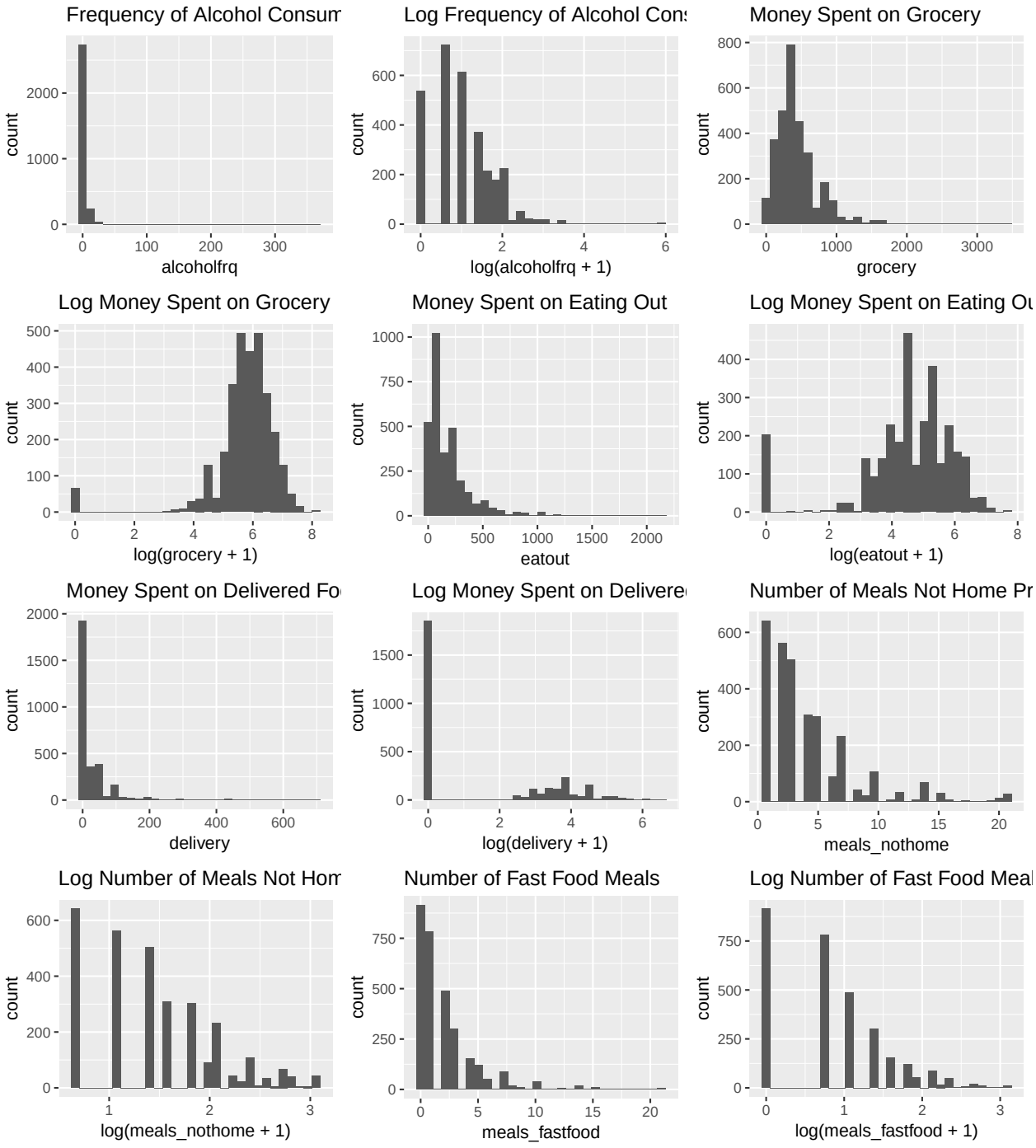
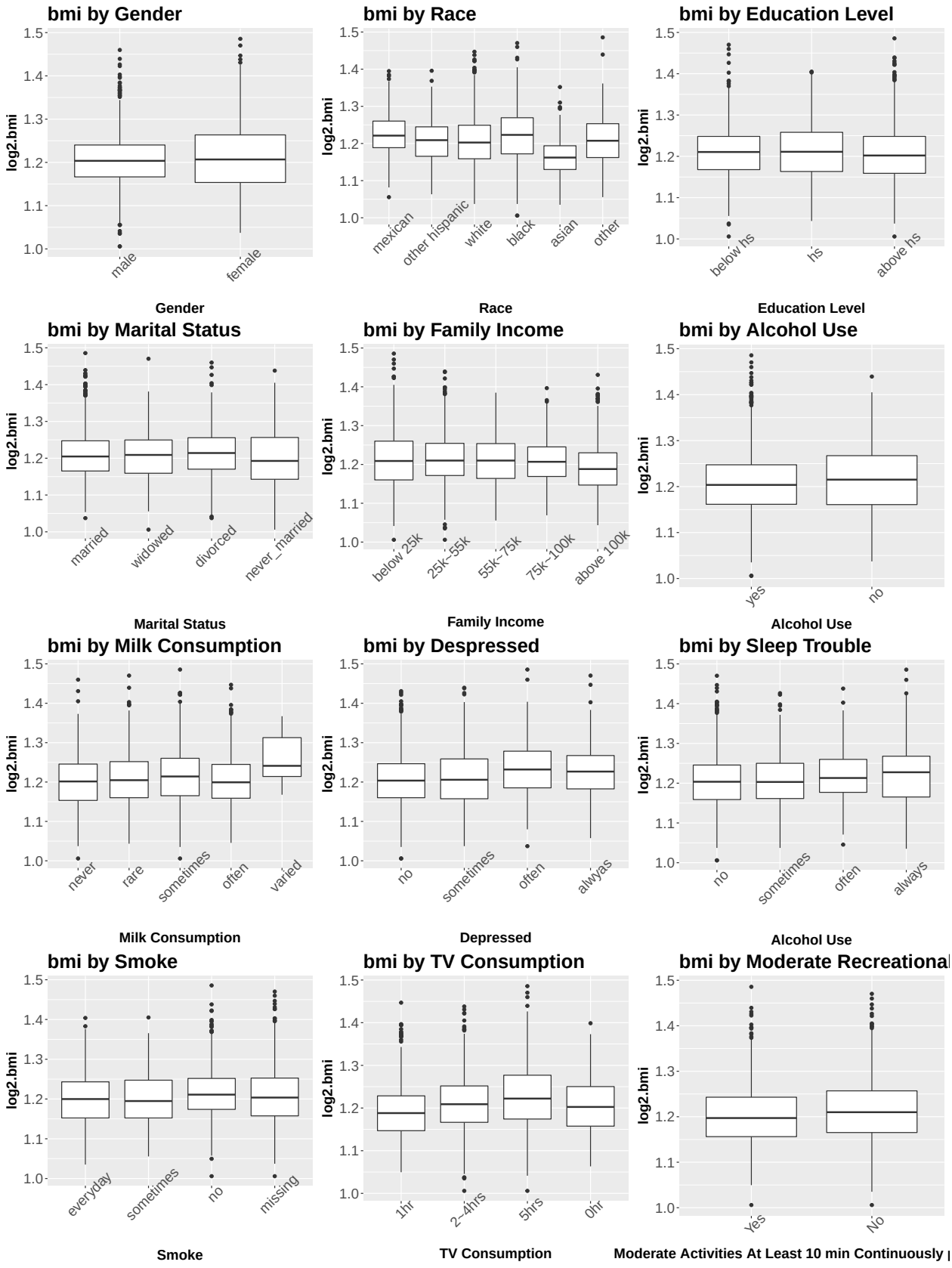
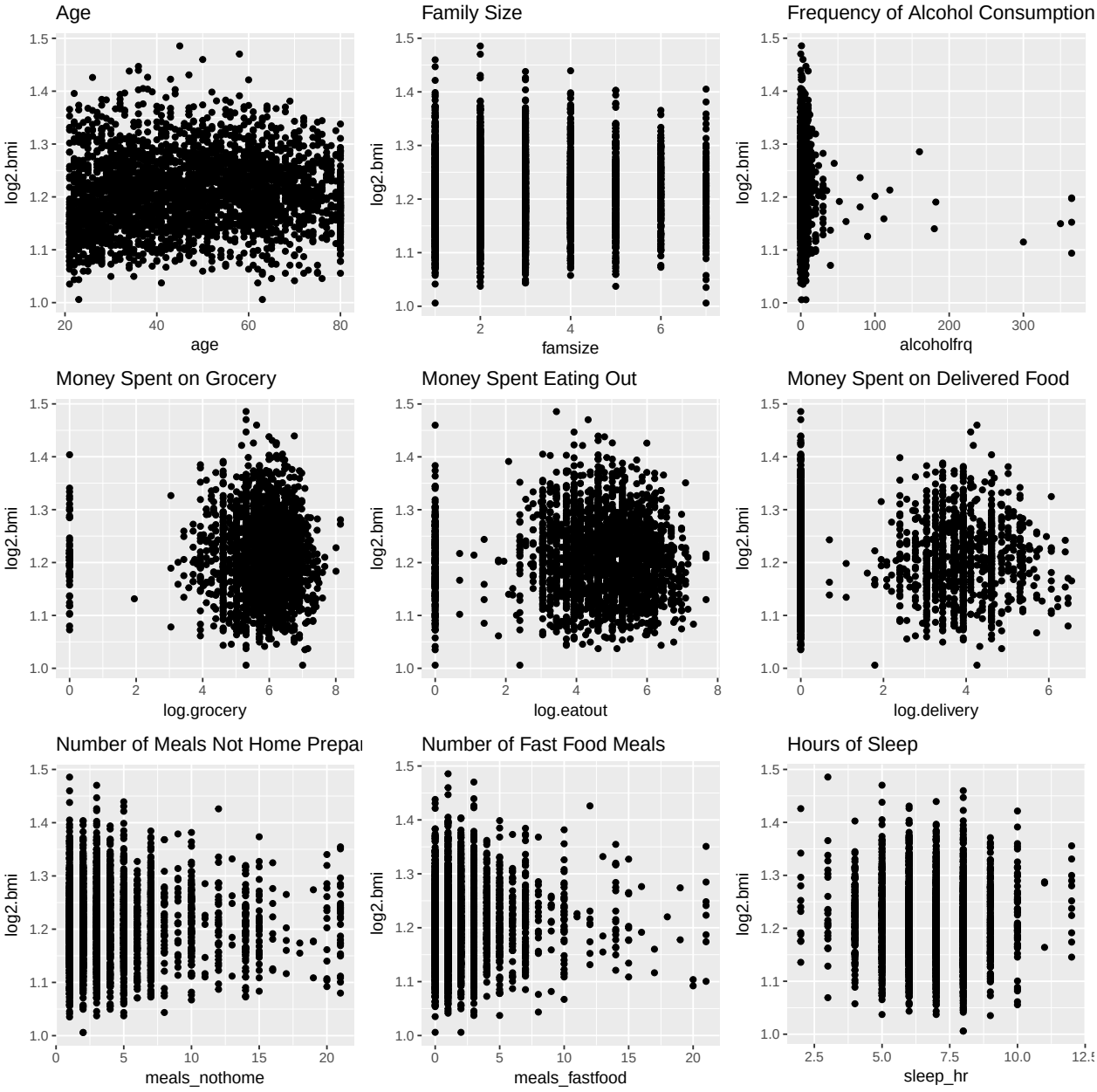


Categorical Variables



Response vs. numeric distribution


Age
log2.bmi
age
Family Size
famsize
Frequency of Alcohol Consumption
alcoholfrq
Money Spent on Grocery
log.grocery
Money Spent Eating Out
log.eatout
Money Spent on Delivered Food
log.delivery
Number of Meals Not Home Prepar
meals_nothome
Number of Fast Food Meals
meals_fastfood
Hours of Sleep
sleep_hr