

Statistical Inference Course Project Part 2

Peer Graded Assignment: Statistical Inference Course Project

Instructions

The project consists of two parts:

- A simulation exercise.
- Basic inferential data analysis.

Part 2: Basic Inferential Data Analysis Instructions

Now in the second portion of the project, we're going to analyze the ToothGrowth data in the R datasets package.

Load the ToothGrowth data and perform some basic exploratory data analysis

```
library(datasets)
data(ToothGrowth)
library(ggplot2)

str(ToothGrowth)

## 'data.frame':  60 obs. of  3 variables:
##  $ len : num  4.2 11.5 7.3 5.8 6.4 10 11.2 11.2 5.2 7 ...
##  $ supp: Factor w/ 2 levels "OJ","VC": 2 2 2 2 2 2 2 2 2 2 ...
##  $ dose: num  0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 ...

head(ToothGrowth)
```

	len	supp
	<dbl>	<fctr>
1	4.2	VC
2	11.5	VC
3	7.3	VC

len supp
<dbl> <fctr>

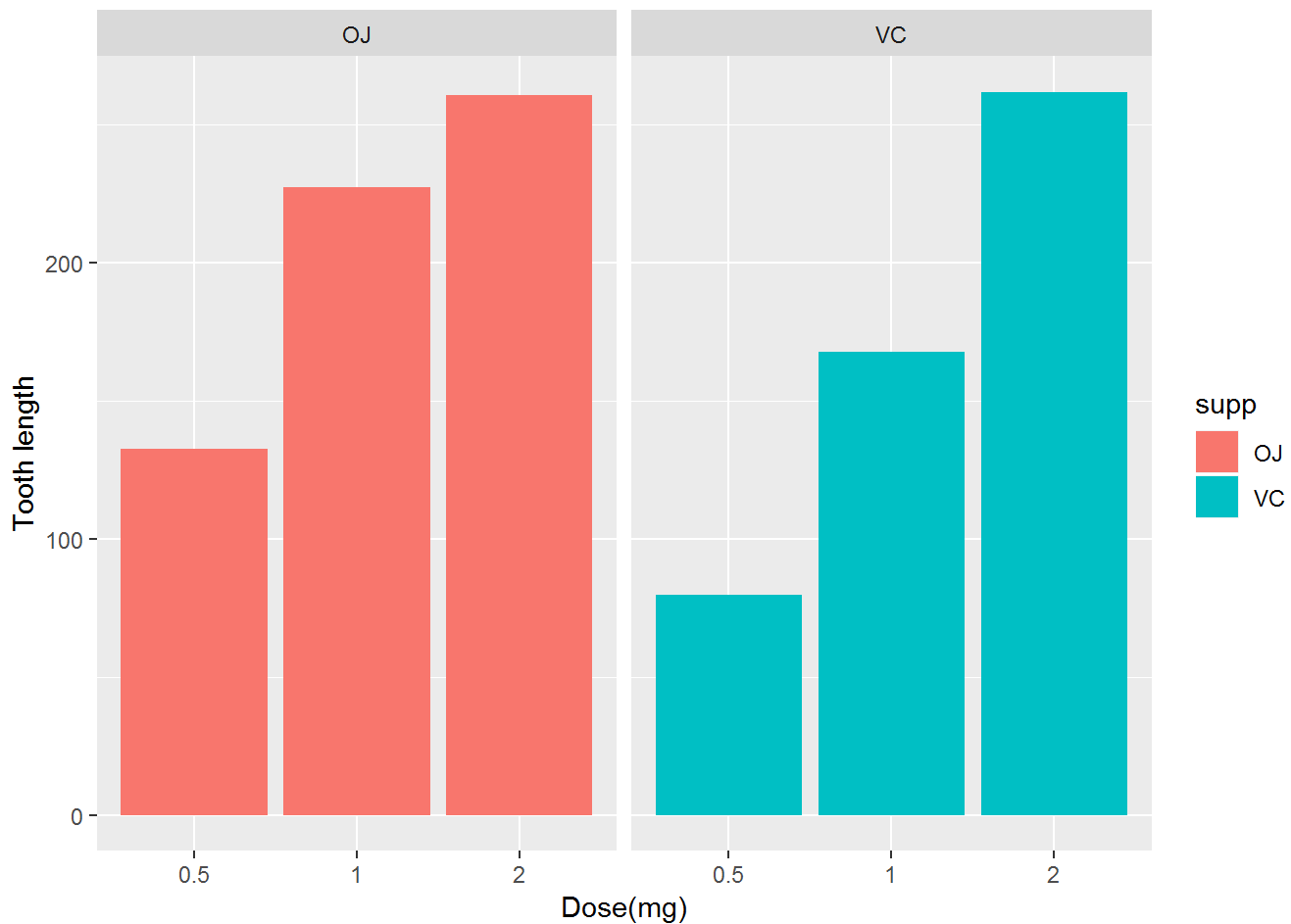
4	5.8	VC
5	6.4	VC
6	10.0	VC

6 rows

```
summary(ToothGrowth)
```

```
##      len      supp      dose
##  Min.    : 4.20   OJ:30   Min.    :0.500
##  1st Qu.:13.07   VC:30   1st Qu.:0.500
##  Median :19.25                Median :1.000
##  Mean   :18.81                Mean   :1.167
##  3rd Qu.:25.27                3rd Qu.:2.000
##  Max.   :33.90                Max.   :2.000
```

```
ggplot(data=ToothGrowth, aes(x=as.factor(dose), y=len, fill=supp)) +
  geom_bar(stat="identity") +
  facet_grid(. ~ supp) +
  xlab("Dose (mg) ") +
  ylab("Tooth length")
```



hypothesis tests to compare tooth growth by supp and dose. (Only use the techniques from class, even if there's other approaches worth considering)

```
hypothesis1 <- t.test(len ~ supp, data = ToothGrowth)
hypothesis1$conf.int
## [1] -0.1710156 7.5710156
## attr(,"conf.level")
## [1] 0.95
hypothesis1$p.value
## [1] 0.06063451
hypothesis2<-t.test(len ~ supp, data = subset(ToothGrowth, dose == 0.5))
hypothesis2$conf.int
## [1] 1.719057 8.780943
## attr(,"conf.level")
## [1] 0.95
hypothesis2$p.value
## [1] 0.006358607
hypothesis3<-t.test(len ~ supp, data = subset(ToothGrowth, dose == 1))
hypothesis3$conf.int
## [1] 2.802148 9.057852
```

```
## attr(,"conf.level")
## [1] 0.95
hypoth3$p.value
## [1] 0.001038376
hypoth4<-t.test(len ~ supp, data = subset(ToothGrowth, dose == 2))
hypoth4$conf.int
## [1] -3.79807  3.63807
## attr(,"conf.level")
## [1] 0.95
hypoth4$p.value
## [1] 0.9638516
```

Conclusions

OJ ensures more tooth growth than VC for dosages 0.5 & 1.0. OJ and VC gives the same amount of tooth growth for dose amount 2.0 mg/day. For the entire trail we cannot conclude OJ is more effective than VC for all scenarios.