Midterm_stat535

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Firstly, read in the data

```
rm(list=ls())
df <- read.csv("http://www.math.umass.edu/~anna/Stat535Fall2017/NCs-RTs-02242017.csv")
dim(df)
```

```
## [1] 8963   13
```

Consider the dataset that only contains TR and UNTR conditions

```
mydata <- df[ df$TR.Condition== 'TR' | df$TR.Condition=='UNTR',]
dim(mydata)
```

```
## [1] 4480   13
```

Here, I group the data set by TR conditions. By summarizing the grouped dataset, we can find that the mean reaction time for TR is 0.987 and for UNTR is 1.114. Therefore, there is a 0.127 difference in reaction time between TR pictures and UNTR pictures. The participants got faster in TR pictures.

```
library(dplyr)
```

```
##
## 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
```

```
groupTR <- group_by(mydata, TR.Condition)
TRsummary <- summarise(groupTR, count=n(), meanRT=mean(RT.Rev,na.rm=TRUE), sdTR=sd(RT.Rev,na.rm=TRUE), m
TRsummary
```

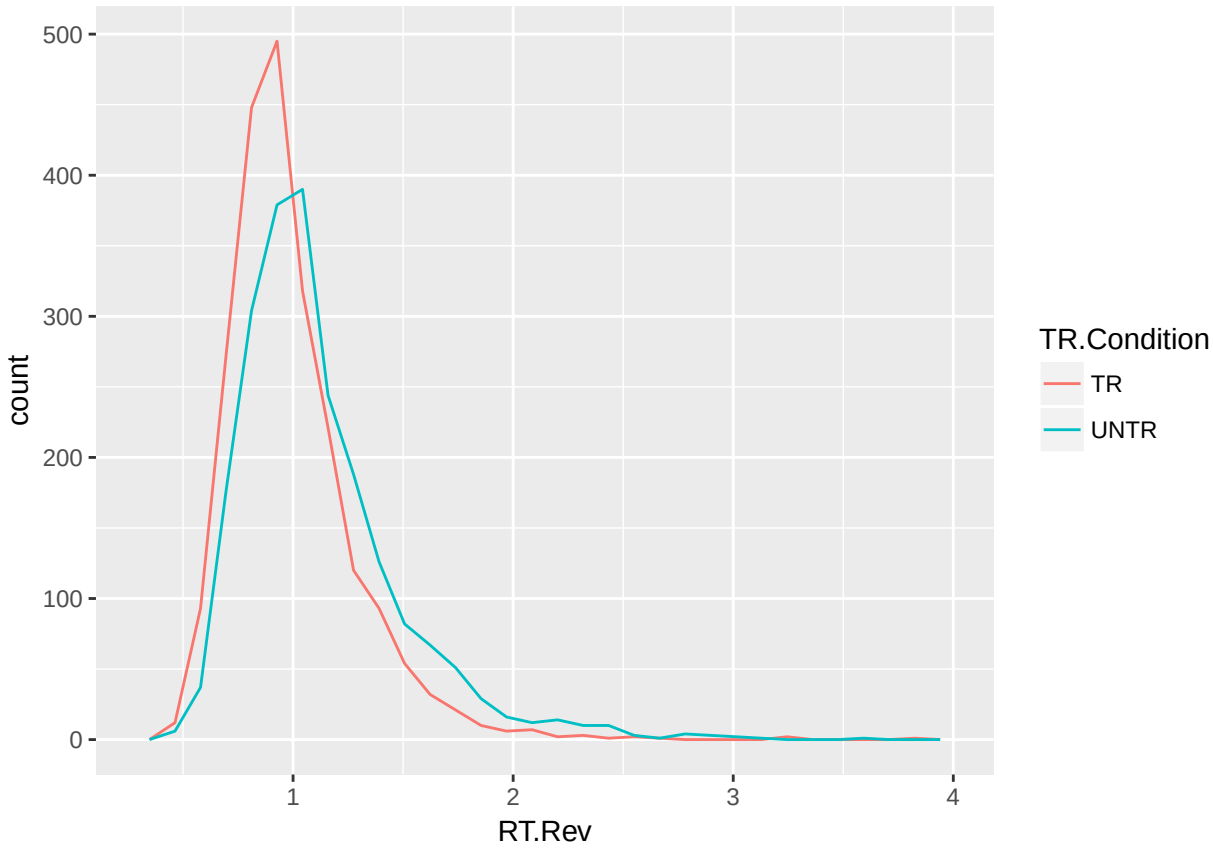
```
## # A tibble: 2 x 6
##   TR.Condition count    meanRT      sdTR  medianRT     Q3rd
##         <fctr> <int>     <dbl>     <dbl>     <dbl>    <dbl>
## 1           TR  2240 0.9879258 0.2893406 0.9299025 1.115635
## 2         UNTR  2240 1.1139828 0.3629193 1.0329755 1.260063
```

I also plot the frequency polygons of Reactiom times under these two conditions separately. We can see that the Reactiom times distribution of TR skews right more than UNTR.

```
library(ggplot2)
ggplot(mydata, aes(x=RT.Rev, group=TR.Condition,color=TR.Condition)) +geom_freqpoly()
```

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

```
## Warning: Removed 110 rows containing non-finite values (stat_bin).
```



Now, we group the dataset by runs ans sessions and consider the reaction times between runs and session. From the summary, we can see that participants got fasteset in the second run of thesecond session and slowest in the first run of the first session.

```
library(dplyr)
groupTR <- group_by(mydata, Session, Run)
TRsummary <- summarise(groupTR, count=n(), meanRT=mean(RT.Rev,na.rm=TRUE), sdTR=sd(RT.Rev,na.rm=TRUE), m
TRsummary
```

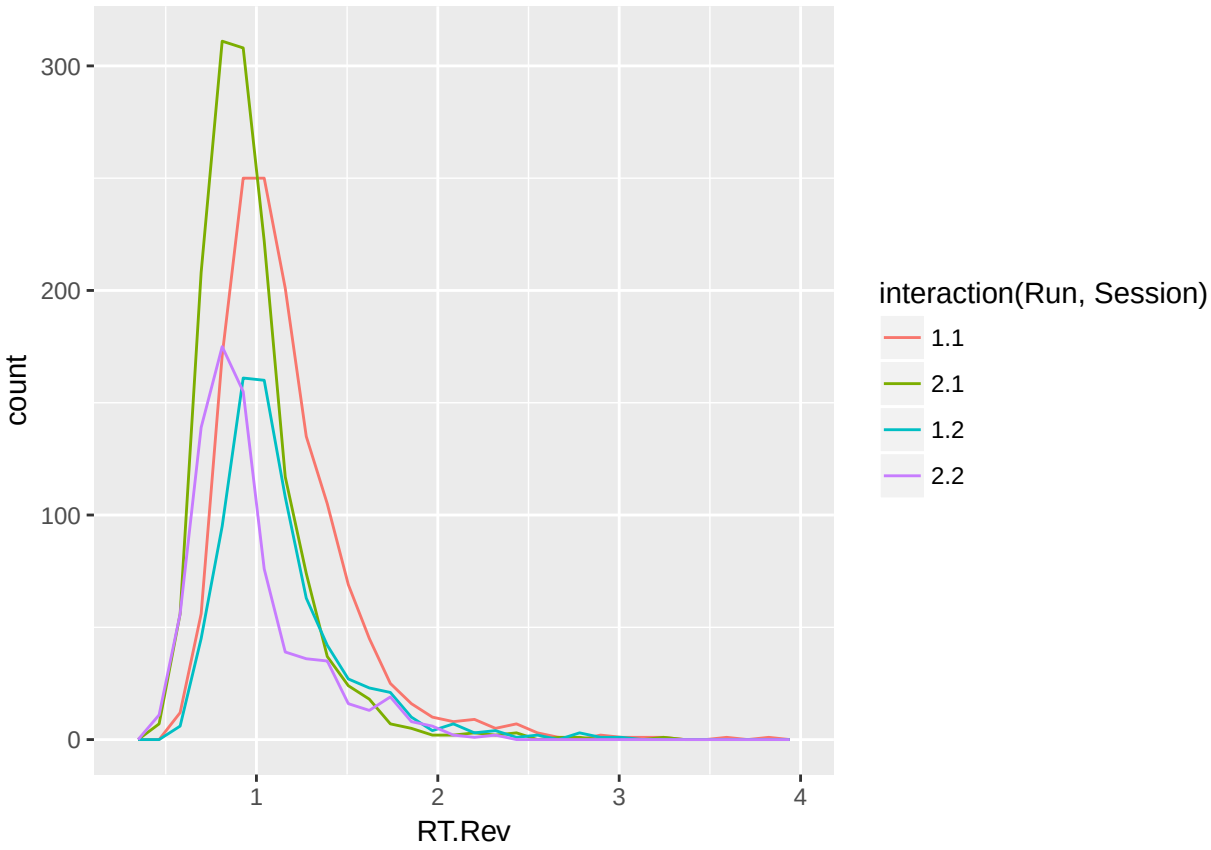
```
## # A tibble: 4 x 7
## # Groups:   Session [?]
##   Session   Run count    meanRT      sdTR medianRT     Q3rd
##     <int> <int> <int>     <dbl>     <dbl>    <dbl>    <dbl>
## 1       1     1  1440 1.1536774 0.3559860 1.086689 1.300201
## 2       1     2  1440 0.9614813 0.2714277 0.913515 1.072929
## 3       2     1   800 1.1219835 0.3413533 1.042954 1.249547
## 4       2     2   800 0.9549346 0.3158626 0.875737 1.062582
```

Also, frequency polygons of Reactiom times are plotted here.

```
library(ggplot2)
ggplot(mydata, aes(x=RT.Rev, group=interaction(Run, Session),color=interaction(Run, Session))) +geom_fr
```

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

```
## Warning: Removed 110 rows containing non-finite values (stat_bin).
```



Now, we consider the reaction times between word classes. By consider their mean reaction times, we can find that naming of objects is faster than naming of actions.

```
library(dplyr)
groupTR <- group_by(mydata, Word.Class)
TRsummary <- summarise(groupTR, count=n(), meanRT=mean(RT.Rev,na.rm=TRUE), sdTR=sd(RT.Rev,na.rm=TRUE), m
TRsummary
```

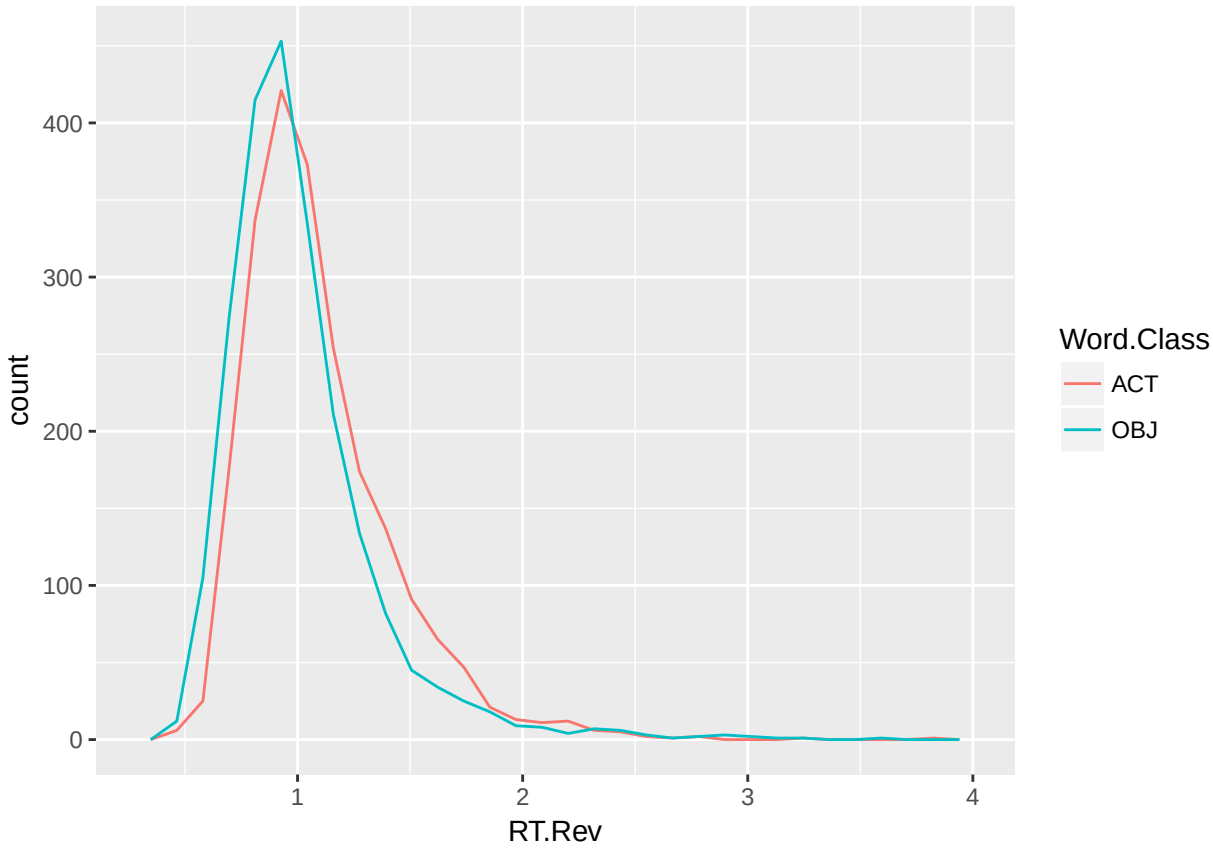
```
## # A tibble: 2 x 6
##   Word.Class count   meanRT      sdTR  medianRT     Q3rd
##       <fctr> <int>    <dbl>     <dbl>     <dbl>    <dbl>
## 1        ACT  2240 1.093480 0.3292423 1.0242110 1.248839
## 2        OBJ  2240 1.006953 0.3325476 0.9400225 1.127287
```

Here, I also plot the frequency polygons of Reactiom times under these two conditions separately. We can see that the Reactiom times distribution of OBJ skews right more than ACT.

```
library(ggplot2)
ggplot(mydata, aes(x=RT.Rev, group=Word.Class,color=Word.Class)) +geom_freqpoly()
```

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

```
## Warning: Removed 110 rows containing non-finite values (stat_bin).
```



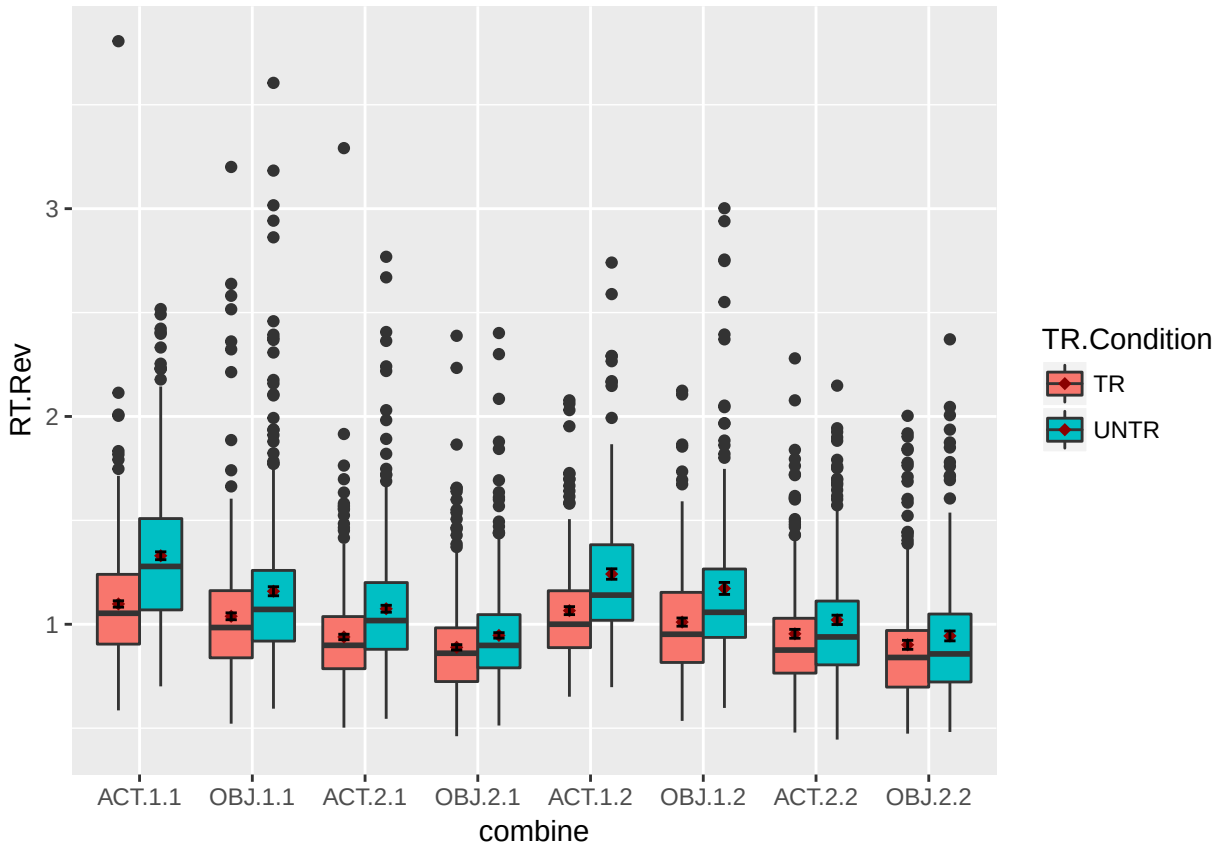
Boxplot of reaction time for participants naming Actions, Onjects oictures during two runs and two sessions under two different practice condtions-TR and UNTR.

```
library(ggplot2)
mydata$combine <- interaction(mydata$Word.Class, mydata$Run, mydata$Session )
ggplot(aes(y=RT.Rev, x=combine, fill=TR.Condition),data=mydata)+geom_boxplot()+
  stat_summary(fun.y="mean", colour="darkred",  geom="point",position=position_dodge(width=0.75), shape=
  stat_summary(fun.data = mean_se, geom = "errorbar",position=position_dodge(width=0.75),width=.2)
```

```
## Warning: Removed 110 rows containing non-finite values (stat_boxplot).
```

```
## Warning: Removed 110 rows containing non-finite values (stat_summary).
```

```
## Warning: Removed 110 rows containing non-finite values (stat_summary).
```


RT.Rev
3
2
1
ACT.1.1
OBJ.1.1
ACT.2.1
OBJ.2.1
ACT.1.2
OBJ.1.2
ACT.2.2
OBJ.2.2
combine
TR.Condition
TR
UNTR