Visual search experiment 2017

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Visual search data

```
#Load data
search<- read.csv("~/Documents/python_files/sandbox/visual_search/visual_search_data/visual_search_data
'% accuracy:'
```

```
## [1] "% accuracy:"
```

```
mean(search$correct_resp,na.rm = TRUE)*100
```

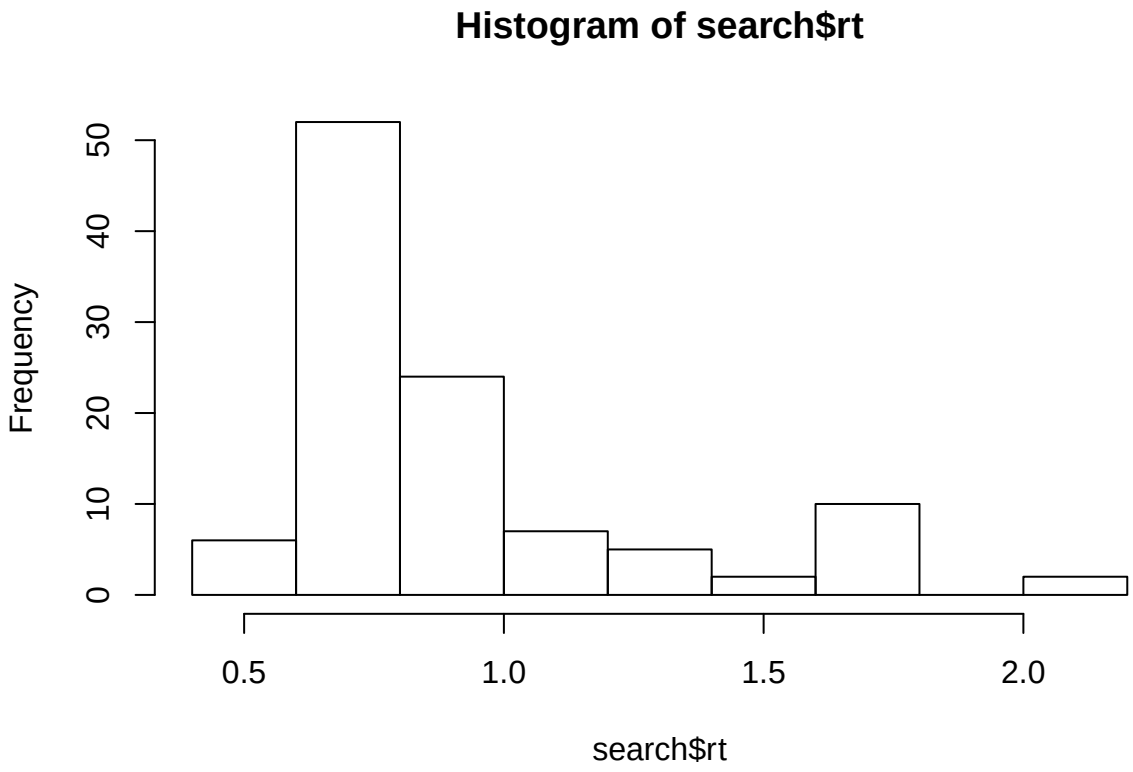
```
## [1] 95.57522
```

Now remove data with incorrect responses

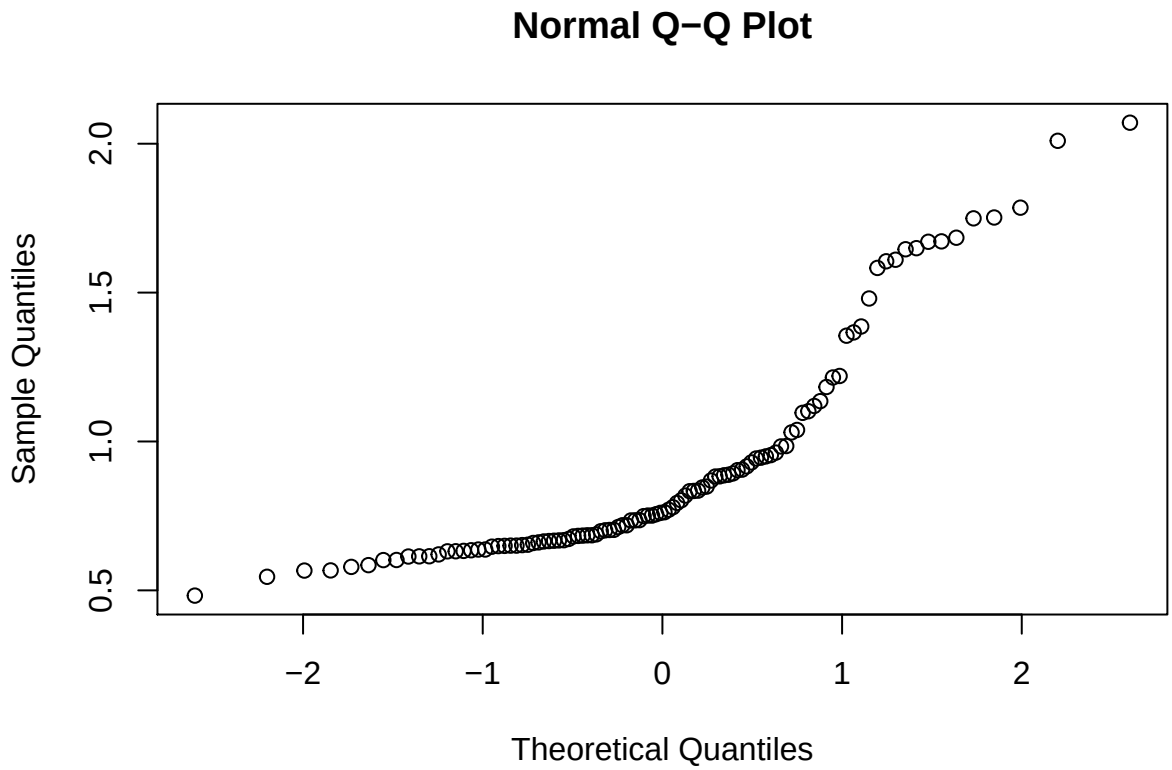
```
#Remove NAs
search<-subset(search,search$rt!="NA")
search<-subset(search,search$correct_resp!=0)

#turn variables into factors
search$conjunct<-as.factor(search$conjunct)
search$present<-as.factor(search$present)
#Remove outliers
#search<-subset(search,search$rt<mean(search$rt)+3*sd(search$rt))
```

Plot histogram of data

```
#histogram
hist(search$rt,breaks=10)
```



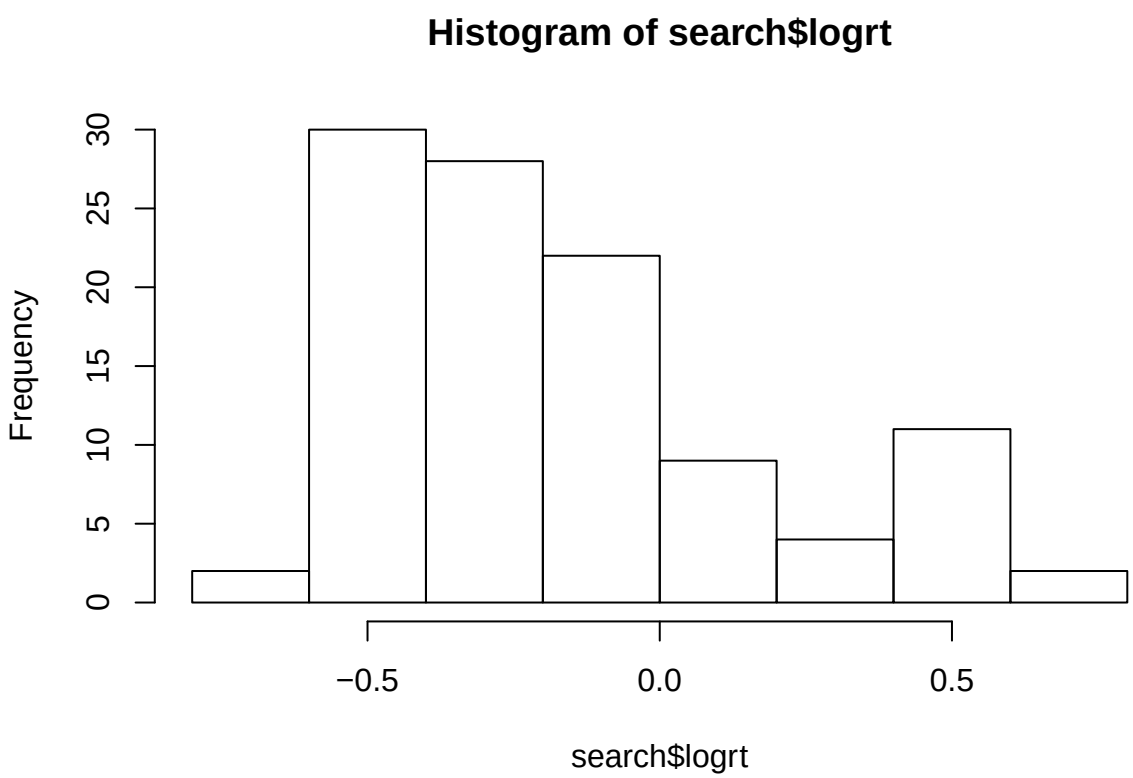

```
#Q-Q-plot
qqnorm(search$rt)
```



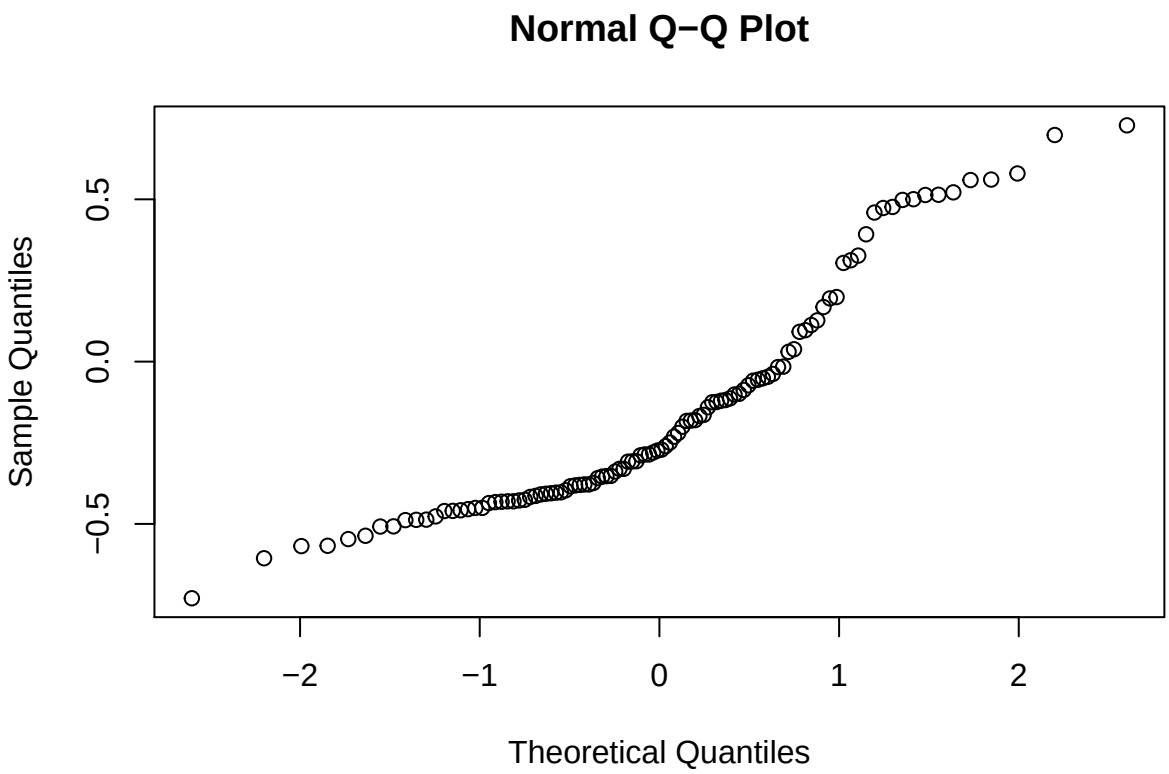
####The data is not normally distributed

Try with a log-transform

```
#make a log-transformation
search$logrt=log(search$rt)
#histogram
hist(search$logrt,breaks=10)
```




```
#Q-Q-plot
qqnorm(search$logrt)
```



####Better

Try a linear model on log-transformed data

```
search_model<-lm(logrt~setsize*conjunct*present, data=search)
summary(search_model)
```

```
##
## Call:
## lm(formula = logrt ~ setsize * conjunct * present, data = search)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.43572 -0.08740 -0.00759  0.08781  0.53754
##
## Coefficients:
##                              Estimate Std. Error t value Pr(>|t|)
## (Intercept)                 -0.474937   0.057328  -8.285 5.53e-13 ***
## setsize                      0.001781   0.001251   1.424    0.158
## conjunct1                    0.132474   0.081841   1.619    0.109
## present1                     0.123365   0.087685   1.407    0.163
## setsize:conjunct1            0.009091   0.001712   5.310 6.64e-07 ***
## setsize:present1            -0.002113   0.001836  -1.151    0.252
## conjunct1:present1          -0.073201   0.121907  -0.600    0.550
## setsize:conjunct1:present1 -0.001656   0.002500  -0.662    0.509
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.1752 on 100 degrees of freedom
```

```
## Multiple R-squared:  0.7529, Adjusted R-squared:  0.7357
## F-statistic: 43.54 on 7 and 100 DF,  p-value: < 2.2e-16
```

Plotting of data

```
library(ggplot2)
search$setsize_f<-as.factor(search$setsize)

ggplot(search, aes(x = setsize , y = rt, color=conjunct, fill=present)) +
  geom_point() + labs(x = "setsize", y = "Response time)") +
  geom_smooth(method='lm')
```