

# Analysis\_for\_SuperheroVR

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```
##
## 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

## -----

## You have loaded plyr after dplyr - this is likely to cause problems.
## If you need functions from both plyr and dplyr, please load plyr first, then dplyr:
## library(plyr); library(dplyr)

## -----

##
## Attaching package: 'plyr'

## The following objects are masked from 'package:dplyr':
##
##   arrange, count, desc, failwith, id, mutate, rename, summarise,
##   summarize

##
## Attaching package: 'ggplot2'

## The following objects are masked from 'package:psych':
##
##   %+%, alpha

##
## Attaching package: 'rstatix'

## The following objects are masked from 'package:plyr':
##
##   desc, mutate
```

```
## The following object is masked from 'package:stats':  
##  
## filter
```

```
## Registering fonts with R
```

```
#Read Data
```

```
dat <- read.csv('/Users/seoyeonbae/Rcode/superheroVR_data.csv')
```

```
dat$group = as.factor(dat$group)
```

```
#data parsing
```

```
vr <- dat[dat$group == "vr",]
```

```
com <- dat[dat$group == "com",]
```

```
#Normality Tests
```

```
nor_1 <- ggplot(dat, aes(empathic_motives)) + theme(legend.position = 'none') + geom_histogram(aes(y =  
nor_1 + stat_function(fun = dnorm, args = list(mean = mean(dat$empathic_motives, na.rm = TRUE), sd = sd
```

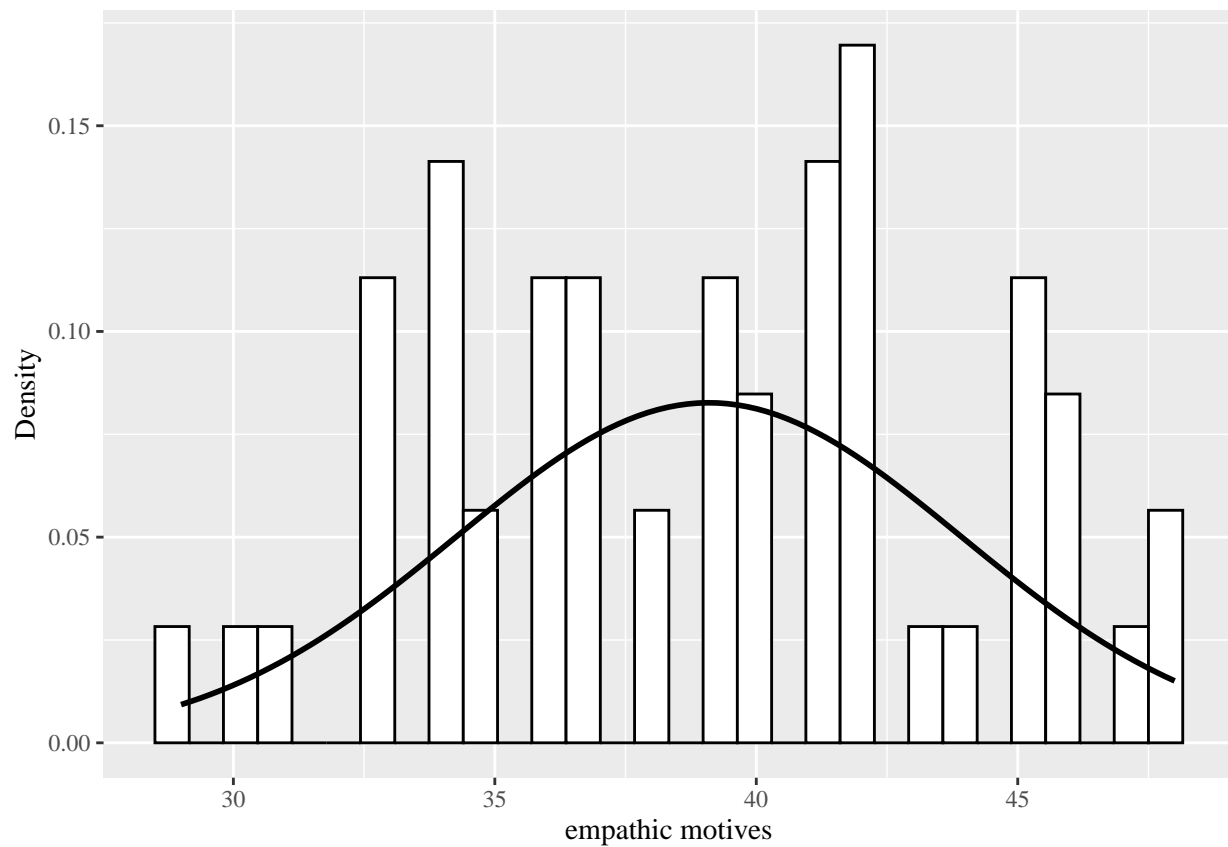
```
## Warning: Using 'size' aesthetic for lines was deprecated in ggplot2 3.4.0.
```

```
## i Please use 'linewidth' instead.
```

```
## Warning: The dot-dot notation ('..density..') was deprecated in ggplot2 3.4.0.
```

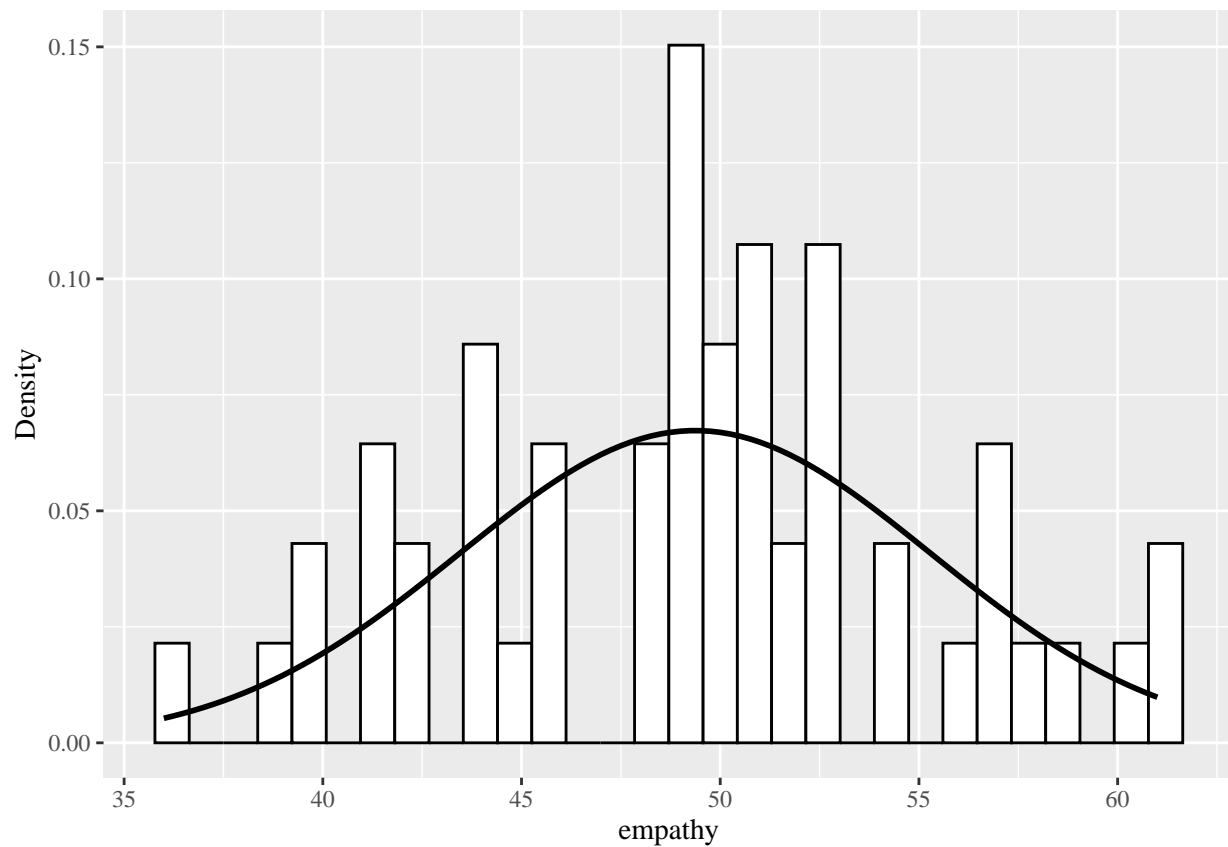
```
## i Please use 'after_stat(density)' instead.
```

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



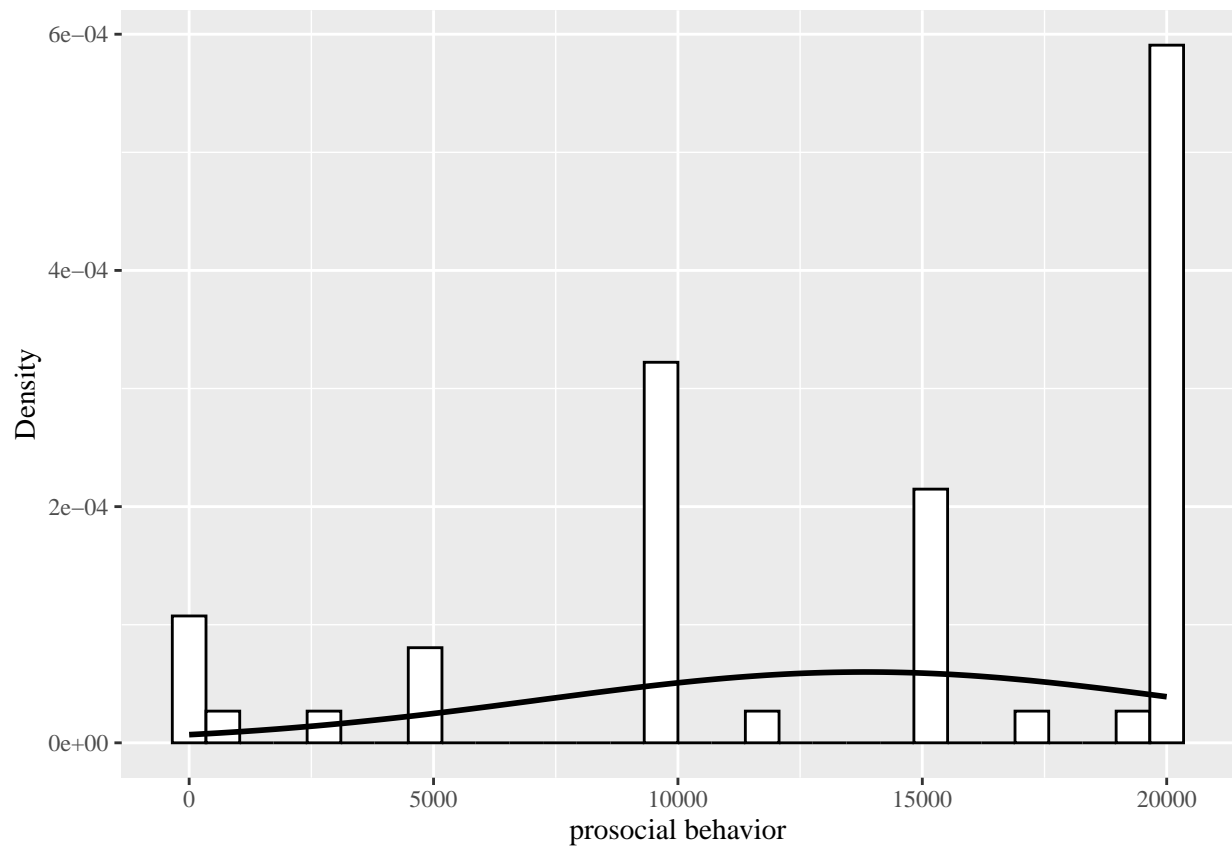
```
nor_2 <- ggplot(dat, aes(empathy)) + theme(legend.position = 'none') + geom_histogram(aes(y = ..density..))
nor_2 + stat_function(fun = dnorm, args = list(mean = mean(dat$empathy, na.rm = TRUE), sd = sd(dat$empathy, na.rm = TRUE)))
```

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



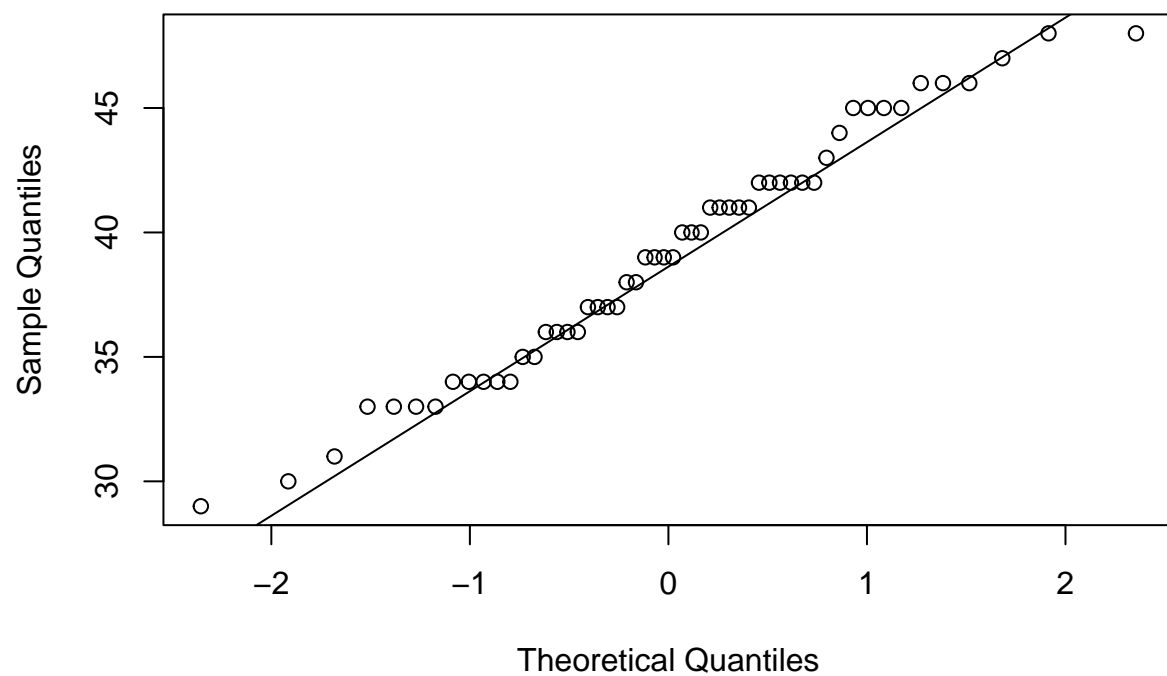
```
nor_3 <- ggplot(dat, aes(prosocial_behavior)) + theme(legend.position = 'none') + geom_histogram(aes(y = density),
nor_3 + stat_function(fun = dnorm, args = list(mean = mean(dat$prosocal_behavior, na.rm = TRUE), sd = sd(dat$prosocal_behavior, na.rm = TRUE)))
```

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



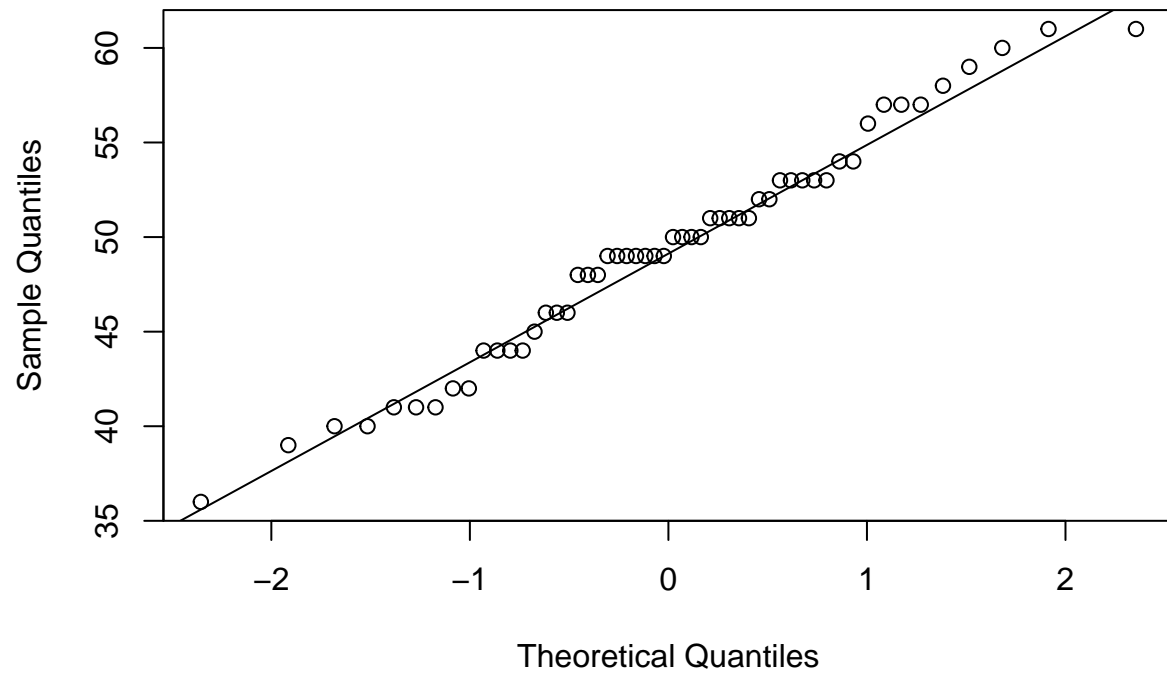
```
qqnorm(dat$empathic_motives)
qqline(dat$empathic_motives)
```

### Normal Q-Q Plot



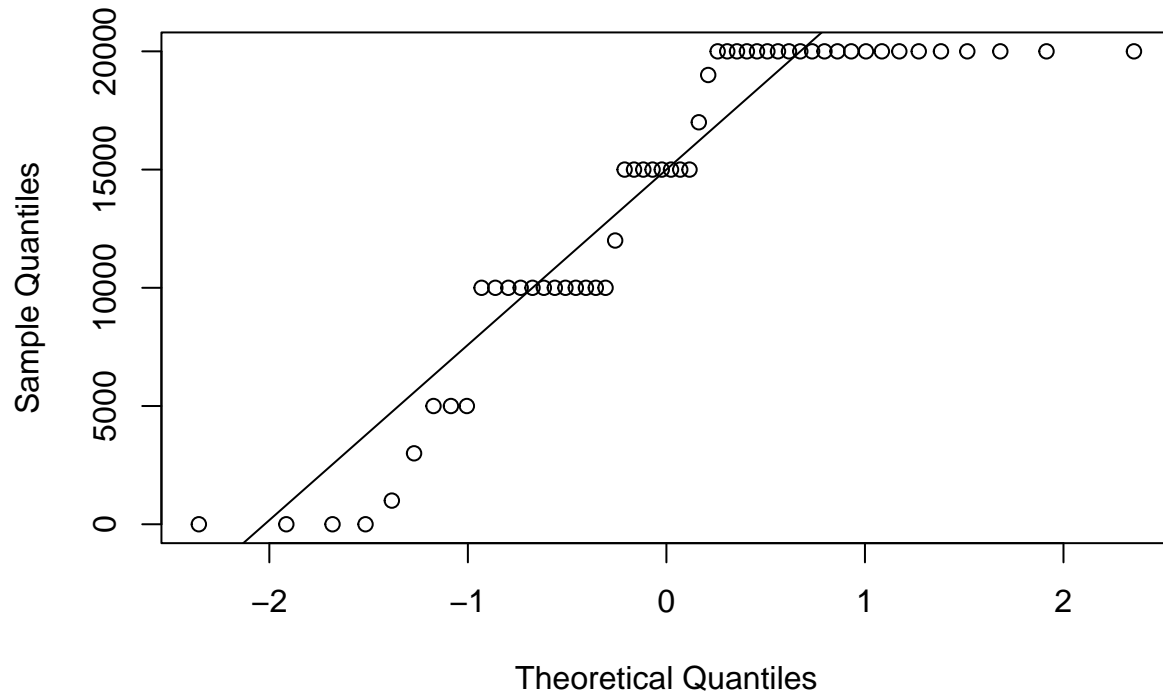
```
qqnorm(dat$empathy)
qqline(dat$empathy)
```

**Normal Q-Q Plot**



```
qqnorm(dat$prosocial_behavior)
qqline(dat$prosocial_behavior)
```

## Normal Q-Q Plot



```
describe(dat[, c("empathic_motives", "empathy", "prosocial_behavior")])
```

```
shapiro.test(dat$empathic_motives)
```

```
##
##  Shapiro-Wilk normality test
##
## data:  dat$empathic_motives
## W = 0.97494, p-value = 0.3148
```

```
shapiro.test(dat$empathy)
```

```
##
##  Shapiro-Wilk normality test
##
## data:  dat$empathy
## W = 0.97988, p-value = 0.4951
```

```
shapiro.test(dat$prosocial_behavior)
```

```
##
##  Shapiro-Wilk normality test
##
## data:  dat$prosocial_behavior
## W = 0.82785, p-value = 2.007e-06
```

```
#Pairwise Comparisons ##Empathic Motives
```

```
var.test(empathic_motives ~ group, data = dat)
```

```
##
## F test to compare two variances
##
## data:  empathic_motives by group
## F = 0.84731, num df = 26, denom df = 26, p-value = 0.6758
## alternative hypothesis: true ratio of variances is not equal to 1
## 95 percent confidence interval:
##  0.3861392 1.8592522
## sample estimates:
## ratio of variances
##          0.8473076
```

```
t.test(empathic_motives ~ group, data = dat)
```

```
##
## Welch Two Sample t-test
##
## data:  empathic_motives by group
## t = 2.3825, df = 51.647, p-value = 0.02091
## alternative hypothesis: true difference in means between group com and group vr is not equal to 0
## 95 percent confidence interval:
##  0.4728686 5.5271314
## sample estimates:
## mean in group com  mean in group vr
##          40.59259          37.59259
```

```
cohensD(vr$empathic_motives, com$empathic_motives)
```

```
## [1] 0.6484375
```

```
##Empathy
```

```
var.test(empathy ~ group, data = dat)
```

```
##
## F test to compare two variances
##
## data:  empathy by group
## F = 1.0655, num df = 26, denom df = 26, p-value = 0.8728
## alternative hypothesis: true ratio of variances is not equal to 1
## 95 percent confidence interval:
##  0.485565 2.337985
## sample estimates:
## ratio of variances
##          1.065478
```



```
t.test(empathy ~ group, data = dat)
```

```
##
## Welch Two Sample t-test
##
## data:  empathy by group
## t = 0.090958, df = 51.948, p-value = 0.9279
## alternative hypothesis: true difference in means between group com and group vr is not equal to 0
## 95 percent confidence interval:
## -3.120267  3.416563
## sample estimates:
## mean in group com mean in group vr
##          49.44444          49.29630
```

```
cohensD(vr$empathy, com$empathy)
```

```
## [1] 0.0247556
```

```
##Hypothetical Prosocial Behavior
```

```
wilcox.test(dat$prosocial_behavior ~ dat$group, paired = FALSE)
```

```
## Warning in wilcox.test.default(x = DATA[[1L]], y = DATA[[2L]], ...): cannot
## compute exact p-value with ties
```

```
##
## Wilcoxon rank sum test with continuity correction
##
## data:  dat$prosocial_behavior by dat$group
## W = 432.5, p-value = 0.2229
## alternative hypothesis: true location shift is not equal to 0
```

```
dat %>% wilcox_effsize(prosocial_behavior ~ group)
```

## Graphs of Each Variable by Groups

