Analysis_for_SuperheroVR

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2024-03-27

```
##
## 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
```

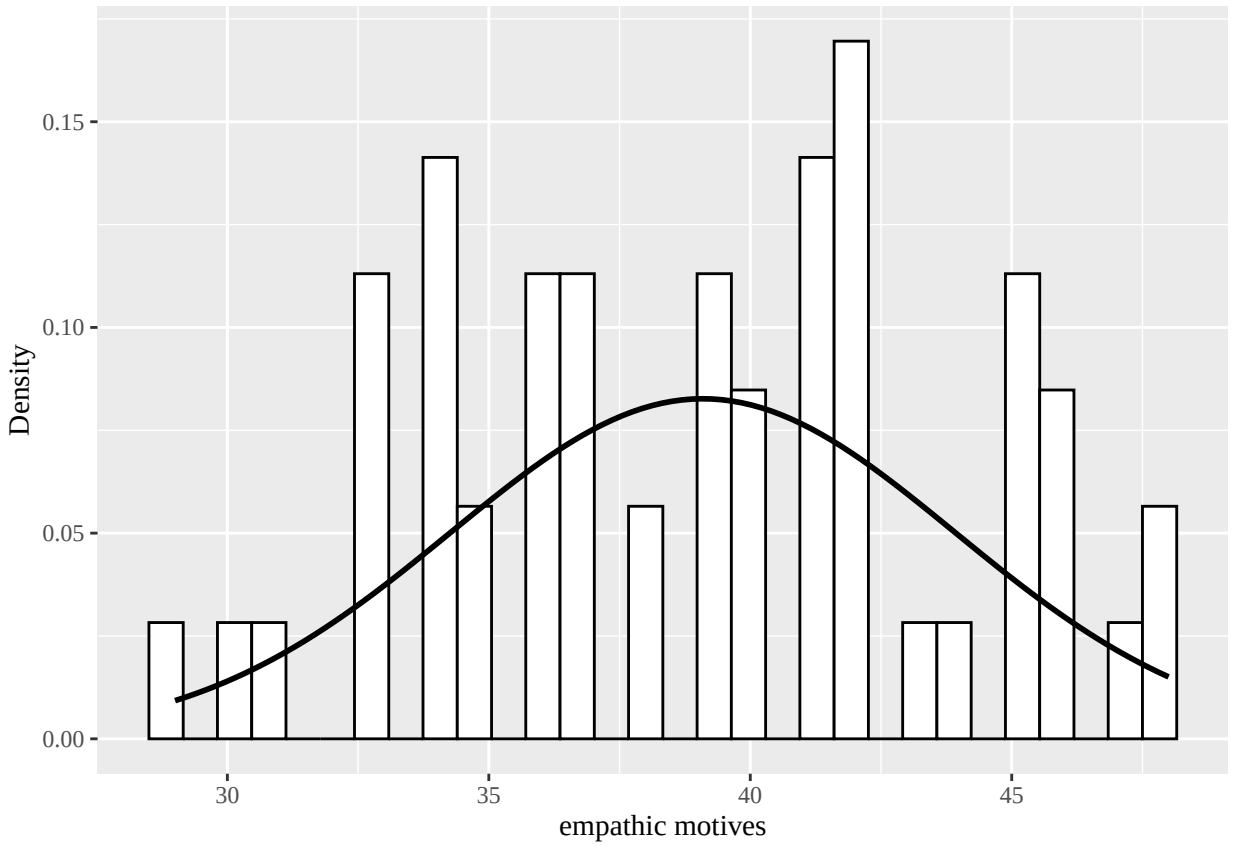
#Read Data

```
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

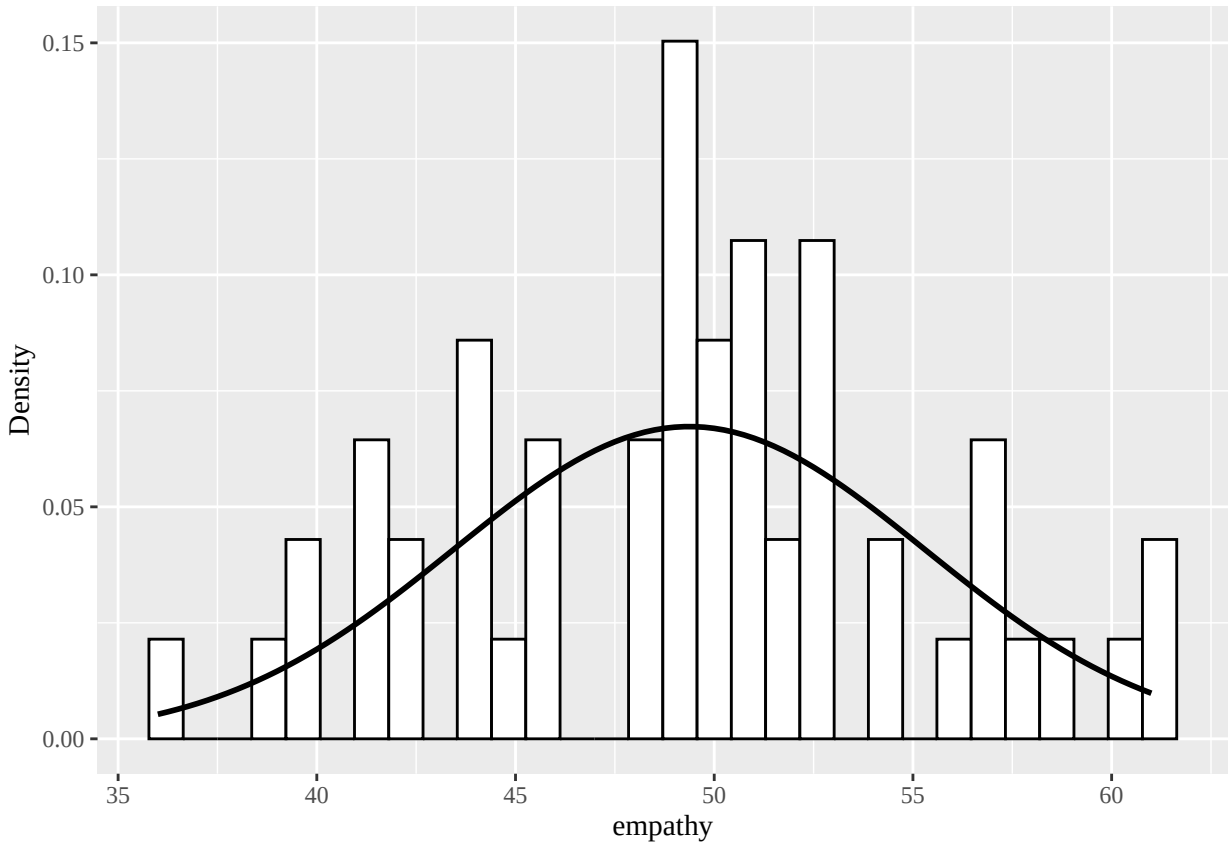
```
nor_1 <- ggplot(dat, aes(empathic_motives)) + theme(legend.position = 'none') + geom_histogram(aes(y =.
nor_1 + stat_function(fun = dnorm, args = list(mean = mean(dat$empathic_motives, na.rm = TRUE), sd = sd
```

```
## 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'.
```



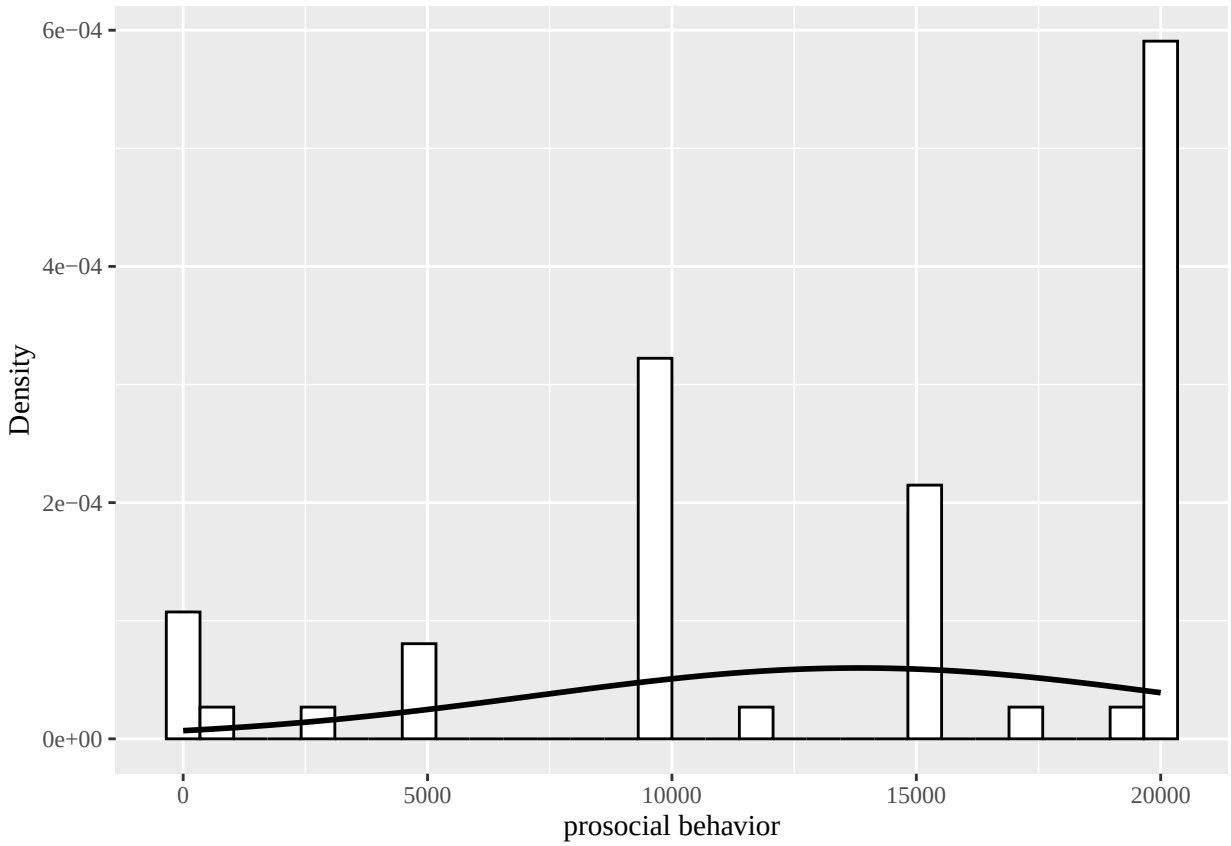

```
nor_2 <- ggplot(dat, aes(empathy)) + theme(legend.position = 'none') + geom_histogram(aes(y =..density.
nor_2 + stat_function(fun = dnorm, args = list(mean = mean(dat$empathy, na.rm = TRUE), sd = sd(dat$empa
```

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

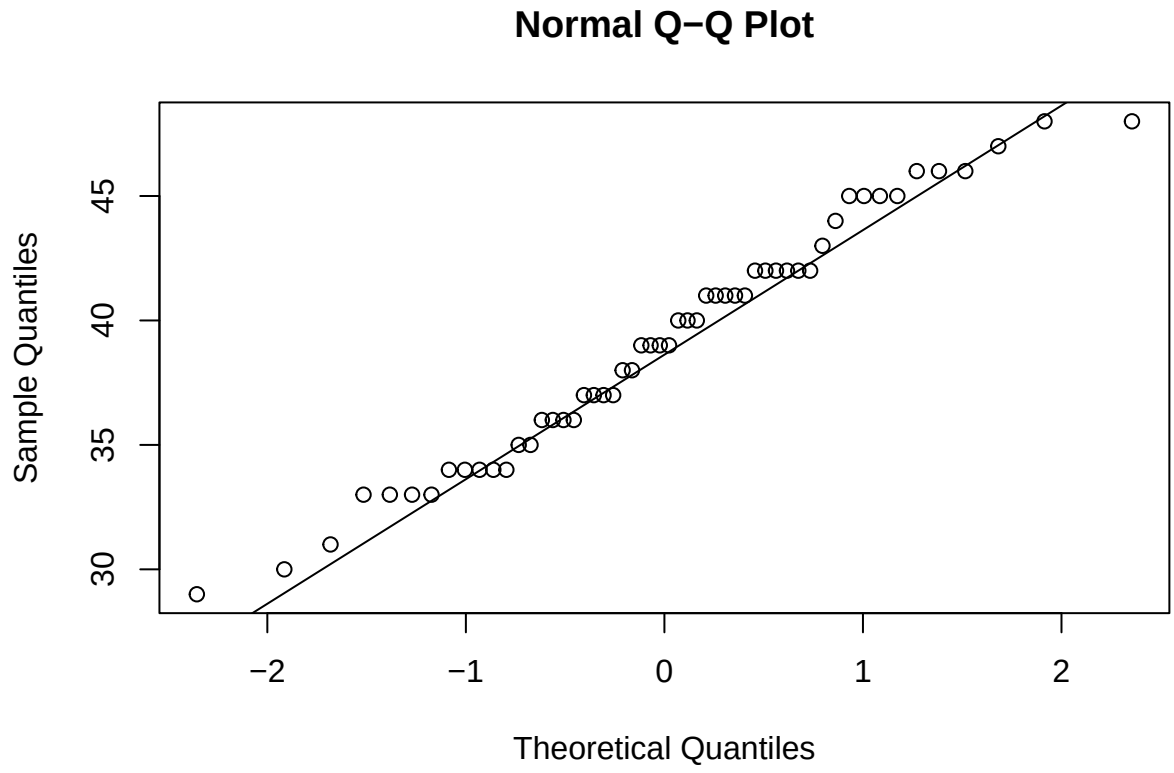



```
nor_3 <- ggplot(dat, aes(prosocial_behavior)) + theme(legend.position = 'none') + geom_histogram(aes(y =
nor_3 + stat_function(fun = dnorm, args = list(mean = mean(dat$prosocial_behavior, na.rm = TRUE), sd = s
```

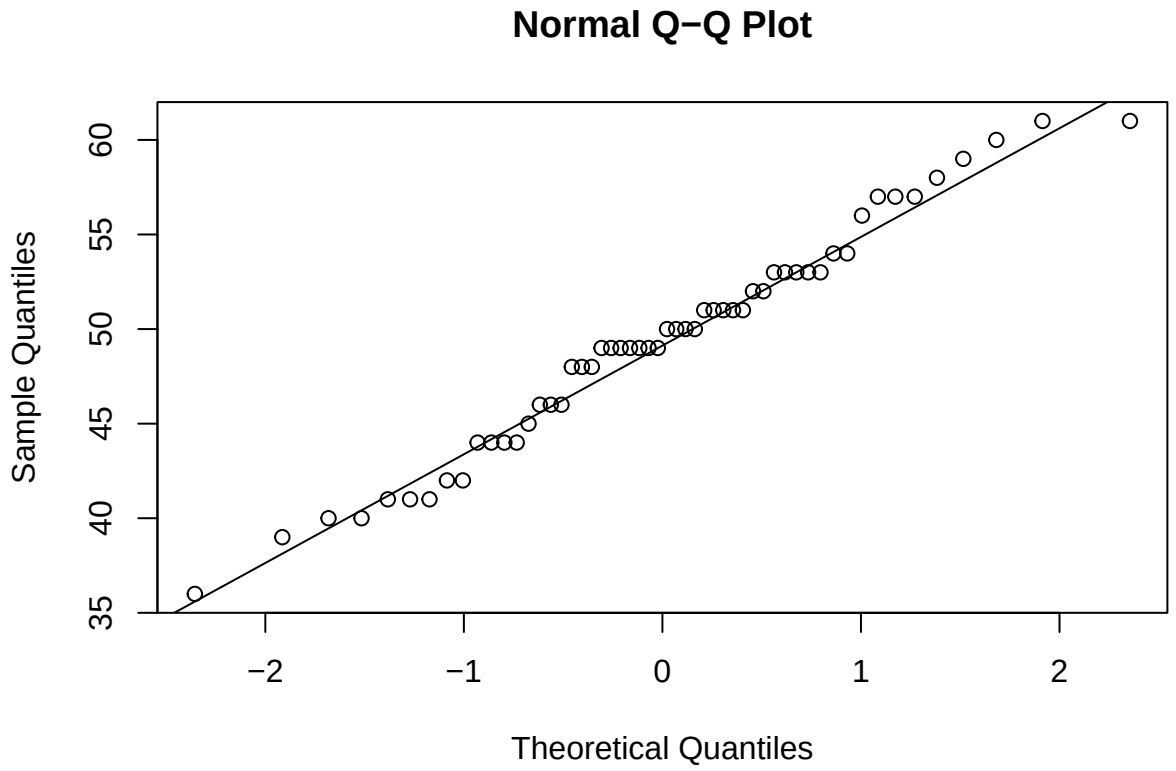
```
## `stat_bin()` using `bins = 30`. Pick better value with `binwidth`.
```



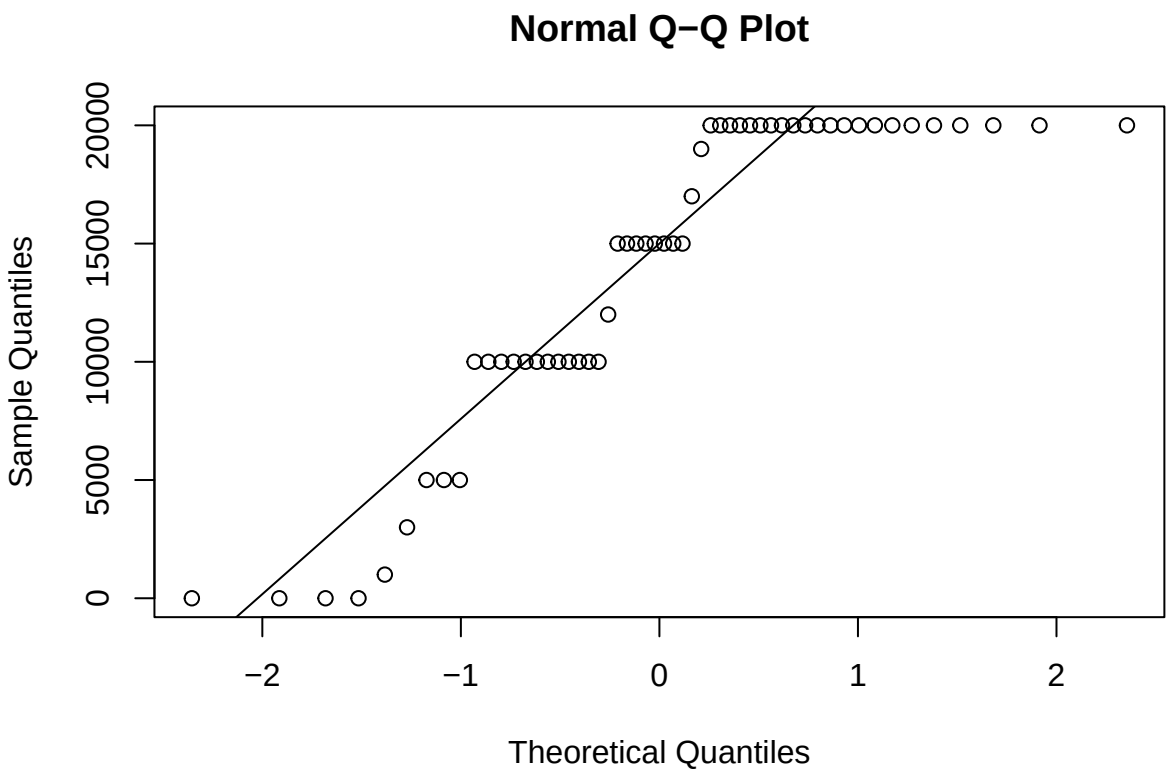

```
qqnorm(dat$empathic_motives)
qqline(dat$empathic_motives)
```



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




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




```
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

```r
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
```

```r
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
```

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

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

##Empathy

```r
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
```

```r
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
```

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

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

##Hypothetical Prosocial Behavior

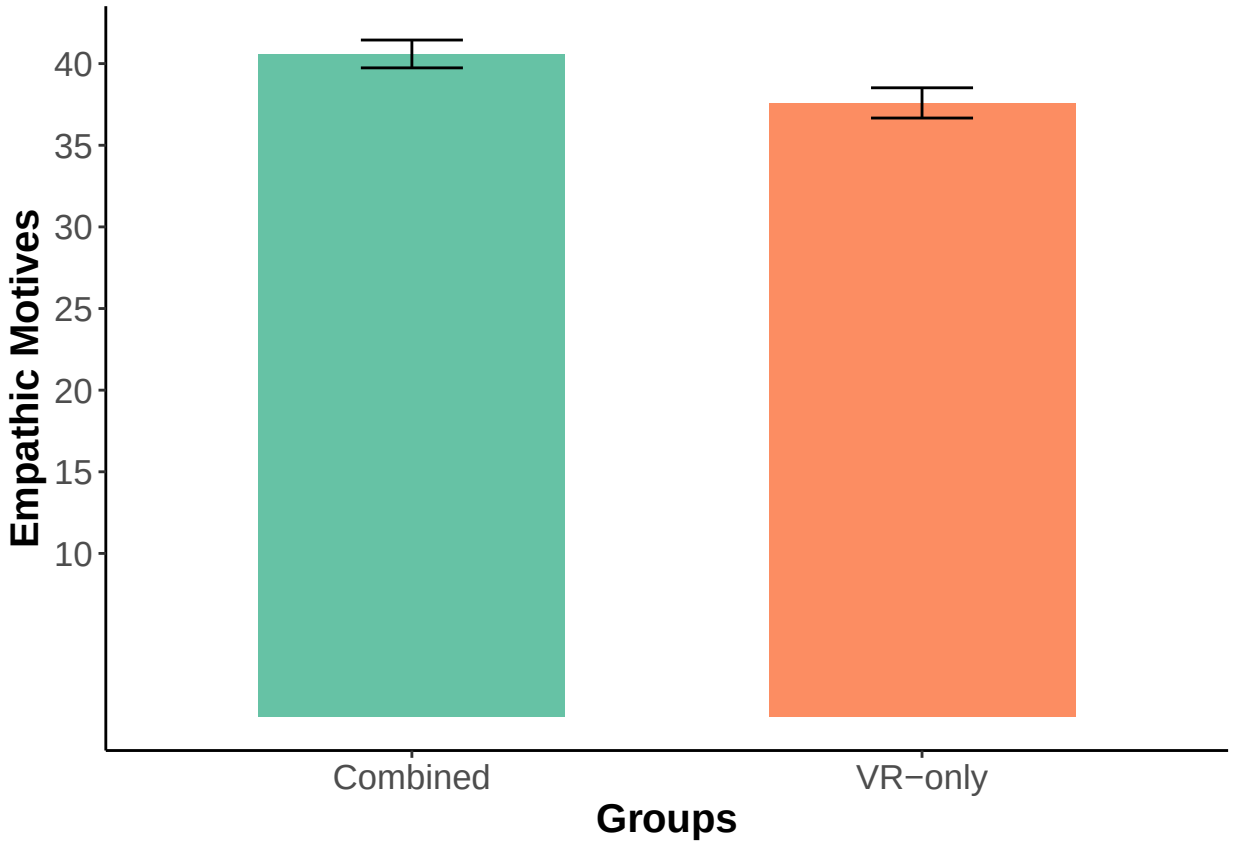
```r
wilcox.test(dat$prosocial_behavior ~ dat$group, paired = FALSE)
```

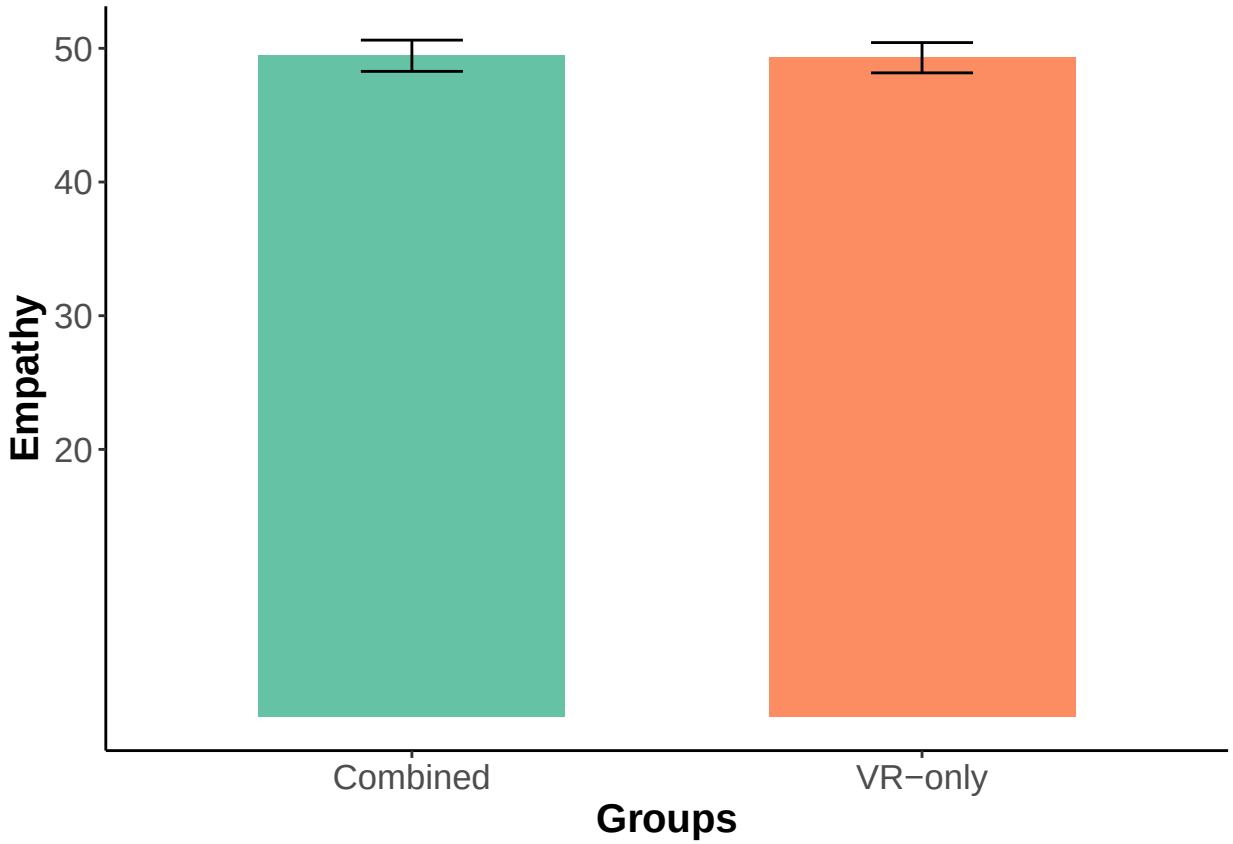
```
## Warning in wilcox.test.default(x = DATA[[1L]], y = DATA[[2L]], ...): cannot
## compute exact p-value with ties
```

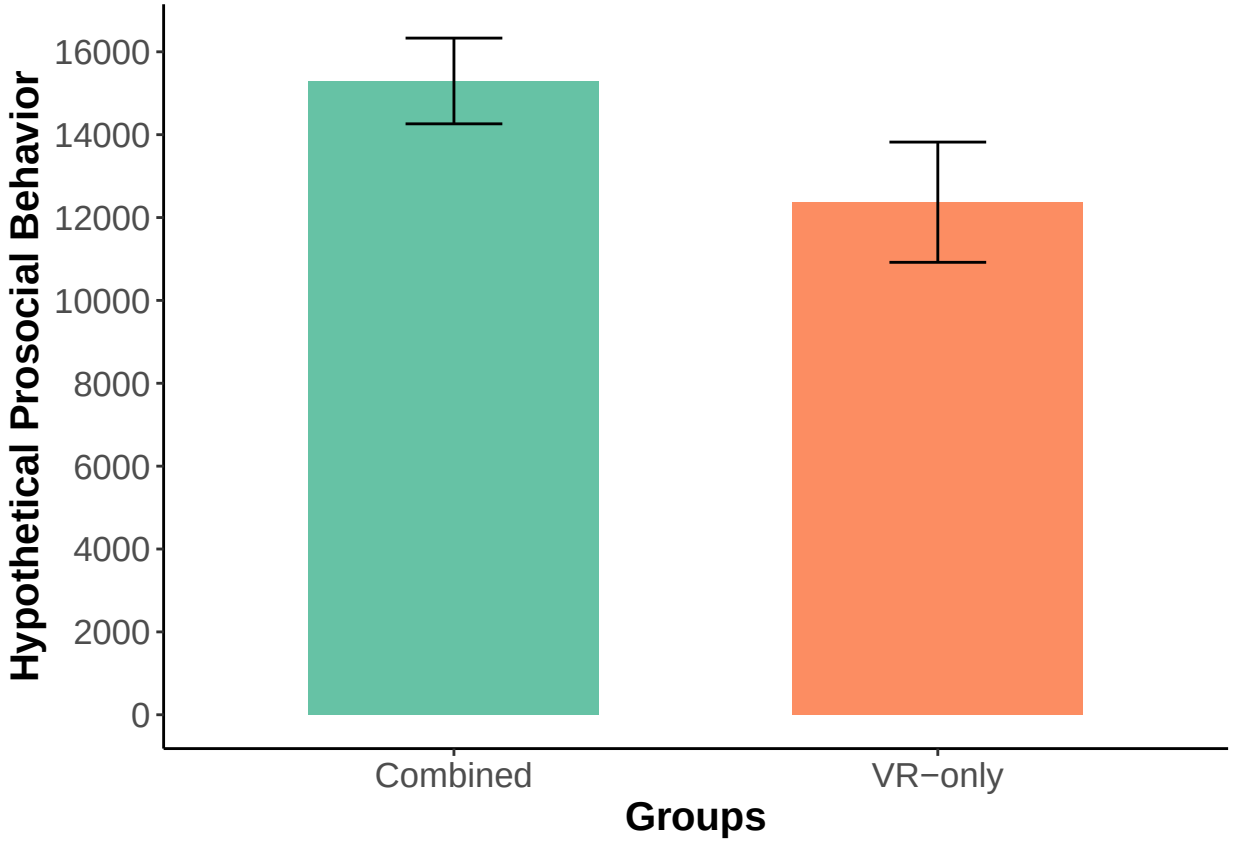
```
##
##  Wilcoxon rank sum test with continuity correction
##
## data:  dat$prosocial_behavior by dat$group
## W = 432.5, p-value = 0.2229
## alternative hypothesis: true location shift is not equal to 0
```

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

Graphs of Each Variable by Groups




Empathy
50
40
30
20
Combined
VR−only
Groups


Hypothetical Prosocial Behavior
16000
14000
12000
10000
8000
6000
4000
2000
0
Combined
VR−only
Groups