```r
library(readxl)
library(afex)
```

```
## Loading required package: lme4
```

```
## Loading required package: Matrix
```

```
## ************
## Welcome to afex. For support visit: http://afex.singmann.science/
```

```
## - Functions for ANOVAs: aov_car(), aov_ez(), and aov_4()
## - Methods for calculating p-values with mixed(): 'S', 'KR', 'LRT', and 'PB'
## - 'afex_aov' and 'mixed' objects can be passed to emmeans() for follow-up tests
## - NEWS: emmeans() for ANOVA models now uses model = 'multivariate' as default.
## - Get and set global package options with: afex_options()
## - Set orthogonal sum-to-zero contrasts globally: set_sum_contrasts()
## - For example analyses see: browseVignettes("afex")
## ************
```

```
##
## Attaching package: 'afex'
```

```
## The following object is masked from 'package:lme4':
##
##     lmer
```

```r
data <- read_excel("../Data/PredictingOutcomes_ParticipantPredictions.xlsx", sheet = "Study 3B")

# divide the data based on the generator
data1 <- data[data$generator == "analyst",]
data2 <- data[data$generator == "bingo",]
data3 <- data[data$generator == "stock",]
```

give count of entries in all three data

```r
nrow(data1)
```

```
## [1] 1764
```

```r
nrow(data2)
```

```
## [1] 1962
```

```r
nrow(data3)
```

```
## [1] 1674
```

calculate the proportion of participants who predicted the prediction_recode=1 for each terminal_streak_length from 1 to 7

```r
prop1 <- aggregate(data1$prediction_recode, by = list(data1$terminal_streak_length), FUN = mean)
prop2 <- aggregate(data2$prediction_recode, by = list(data2$terminal_streak_length), FUN = mean)
prop3 <- aggregate(data3$prediction_recode, by = list(data3$terminal_streak_length), FUN = mean)
```

```r
prop1
```

```
##   Group.1         x
## 1       1 0.3758503
## 2       2 0.2653061
## 3       3 0.4183673
## 4       4 0.5306122
## 5       5 0.5000000
## 6       6 0.5918367
## 7       7 0.5510204
```

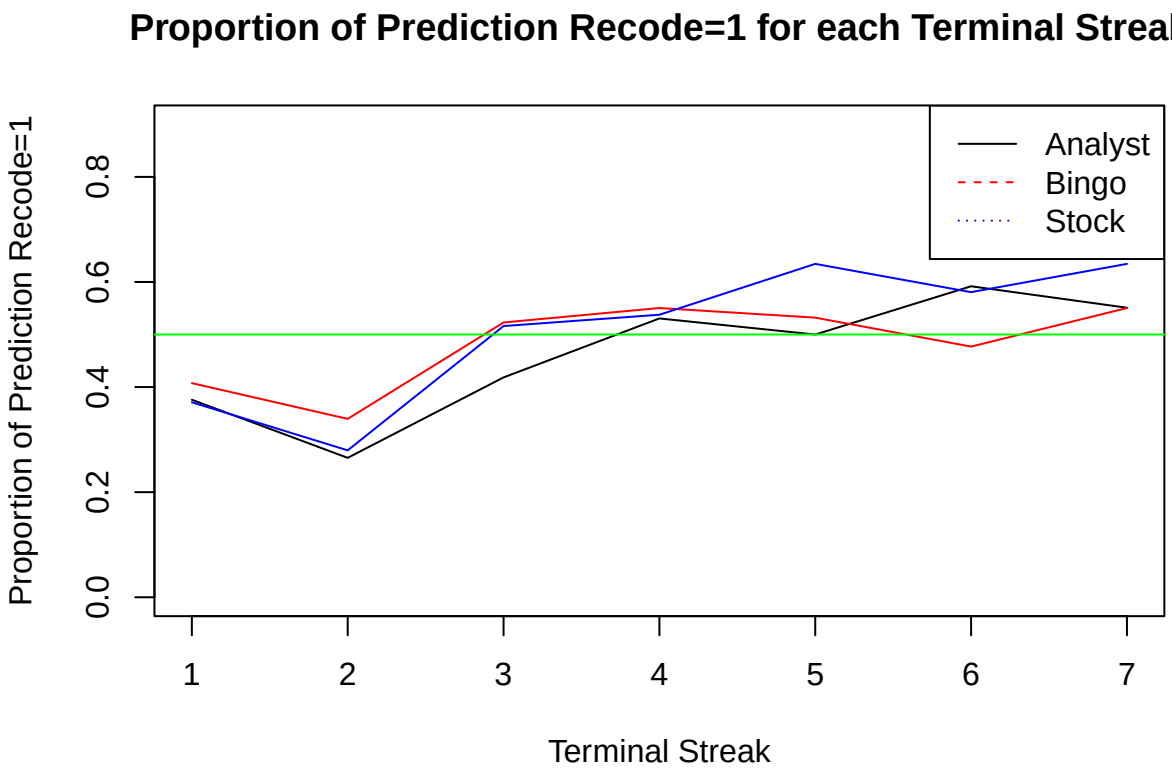
```r
prop2
```

```
##   Group.1         x
## 1       1 0.4074924
## 2       2 0.3394495
## 3       3 0.5229358
## 4       4 0.5504587
## 5       5 0.5321101
## 6       6 0.4770642
## 7       7 0.5504587
```

```r
prop3
```

```
##   Group.1         x
## 1       1 0.3709677
## 2       2 0.2795699
## 3       3 0.5161290
## 4       4 0.5376344
## 5       5 0.6344086
## 6       6 0.5806452
## 7       7 0.6344086
```

```r
plot(prop1$Group.1,prop1$x, type = "l",ylim=c(0.0,0.9), xlab = "Terminal Streak", ylab = "Proportion of
lines(prop2$Group.1,prop2$x, col = "red")
lines(prop3$Group.1,prop3$x,  col = "blue")
abline(h = 0.5, col = "green")
legend("topright", legend = c("Analyst", "Bingo", "Stock"), col = c("black", "red", "blue"), lty = 1:3)
```



calculate the effect of condition on participant predicition

```
model1 <- lmer(prediction_recode ~ generator + (1|participant_id), data = data)
summary(model1)
```

```
## Linear mixed model fit by REML. t-tests use Satterthwaite's method [
## lmerModLmerTest]
## Formula: prediction_recode ~ generator + (1 | participant_id)
##    Data: data
##
## REML criterion at convergence: 7666.3
##
## Scaled residuals:
##     Min      1Q  Median      3Q     Max
## -1.2145 -0.8588 -0.6694  1.0838  1.5428
##
## Random effects:
##  Groups         Name        Variance Std.Dev.
##  participant_id (Intercept) 0.01102  0.105
##  Residual                   0.23330  0.483
## Number of obs: 5400, groups:  participant_id, 300
##
## Fixed effects:
##                 Estimate Std. Error        df t value Pr(>|t|)
## (Intercept)      0.40930    0.01564 296.99999  26.167   <2e-16 ***
## generatorbingo   0.02750    0.02156 296.99999   1.276    0.203
```

```
## generatorstock   0.01484    0.02242 296.99999   0.662    0.509
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Correlation of Fixed Effects:
##             (Intr) gnrtrb
## generatrbng -0.726
## genertrstck -0.698  0.506
```

```
anova(model1)
```

```
## Type III Analysis of Variance Table with Satterthwaite's method
##            Sum Sq Mean Sq NumDF DenDF F value Pr(>F)
## generator 0.37986 0.18993     2   297  0.8141  0.444
```

```
aov1<-aov_ez('participant_id','prediction_recode',data, between=c('generator'),within=c('terminal_streal
```

```
## Converting to factor: generator
```

```
## Warning: More than one observation per design cell, aggregating data using 'fun_aggregate = mean'.
## To turn off this warning, pass 'fun_aggregate = mean' explicitly.
```

```
## Contrasts set to contr.sum for the following variables: generator
```

```
aov1
```

```
## Anova Table (Type 3 tests)
##
## Response: prediction_recode
##                              Effect             df  MSE         F  ges p.value
## 1                         generator         2, 297 0.61      0.58 .002    .561
## 2           terminal_streak_length  5.16, 1533.11 0.17 23.22 *** .044   <.001
## 3 generator:terminal_streak_length 10.32, 1533.11 0.17      1.52 .006    .123
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '+' 0.1 ' ' 1
##
## Sphericity correction method: GG
```

```
pairwise.t.test(data$prediction_recode, data$generator, p.adjust.method = "bonferroni")
```

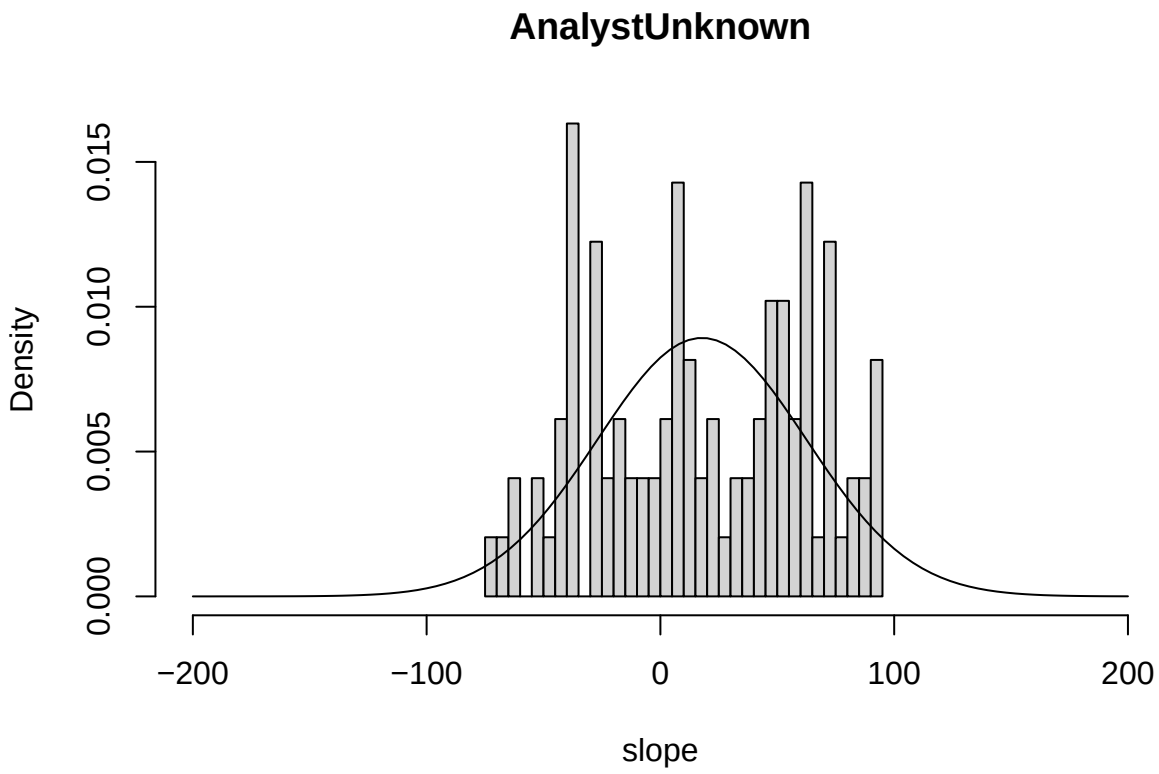
```
##
##  Pairwise comparisons using t tests with pooled SD
##
## data:  data$prediction_recode and data$generator
##
##       analyst bingo
## bingo 0.27    -
## stock 1.00    1.00
##
## P value adjustment method: bonferroni
```

```r
id <- unique(data1$participant_id)

slope <- c()

for (i in id){
x <- as.character(i)
datax <- data1[data1$participant_id == x,]
model <- glm(prediction_recode ~ terminal_streak_length, data = datax)
slope <- c(slope, coef(model)[2])
}
slope <- slope*500

hist(slope,breaks=30,xlim=c(-200,200),prob=TRUE,main="AnalystUnknown")
curve(dnorm(x, mean = mean(slope), sd = sd(slope)), add = TRUE, col = "black")
```



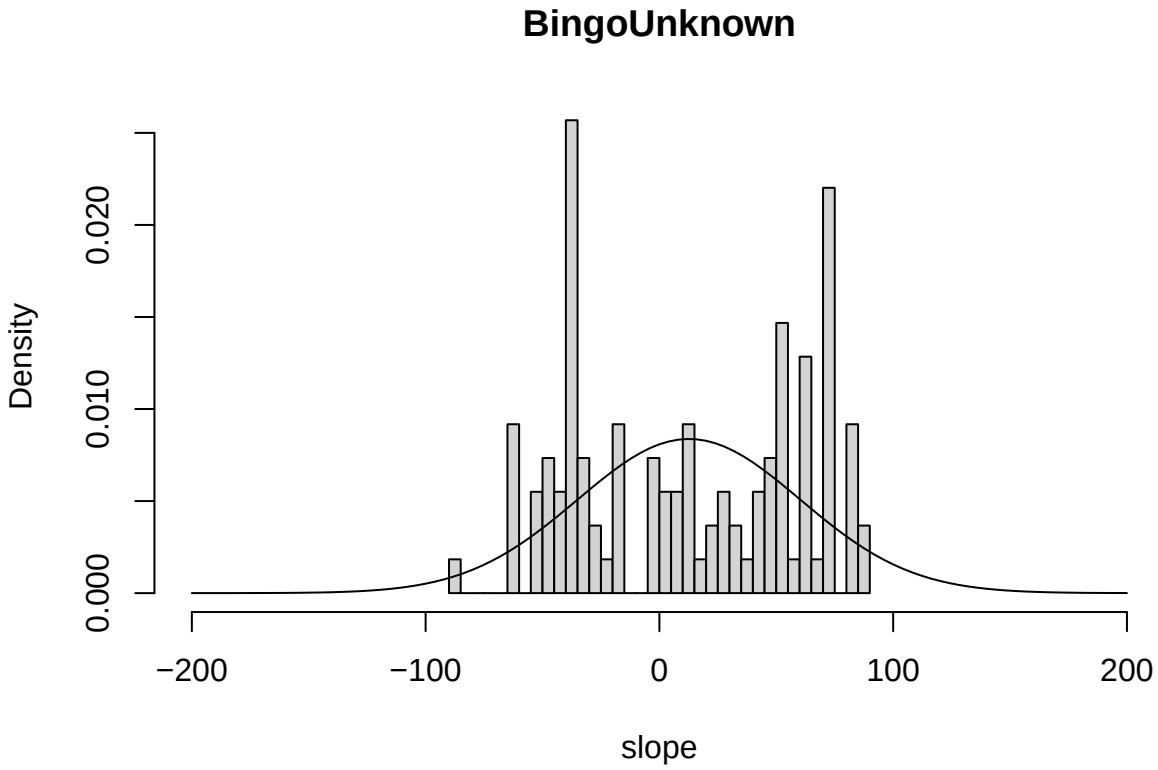

```r
id <- unique(data2$participant_id)

slope <- c()

for (i in id){
x <- as.character(i)
datax <- data2[data2$participant_id == x,]
model <- glm(prediction_recode ~ terminal_streak_length, data = datax)
slope <- c(slope, coef(model)[2])
}
```

```r
slope <- slope*500

hist(slope,breaks=30,xlim=c(-200,200),prob=TRUE,main="BingoUnknown")
curve(dnorm(x, mean = mean(slope), sd = sd(slope)), add = TRUE, col = "black")
```

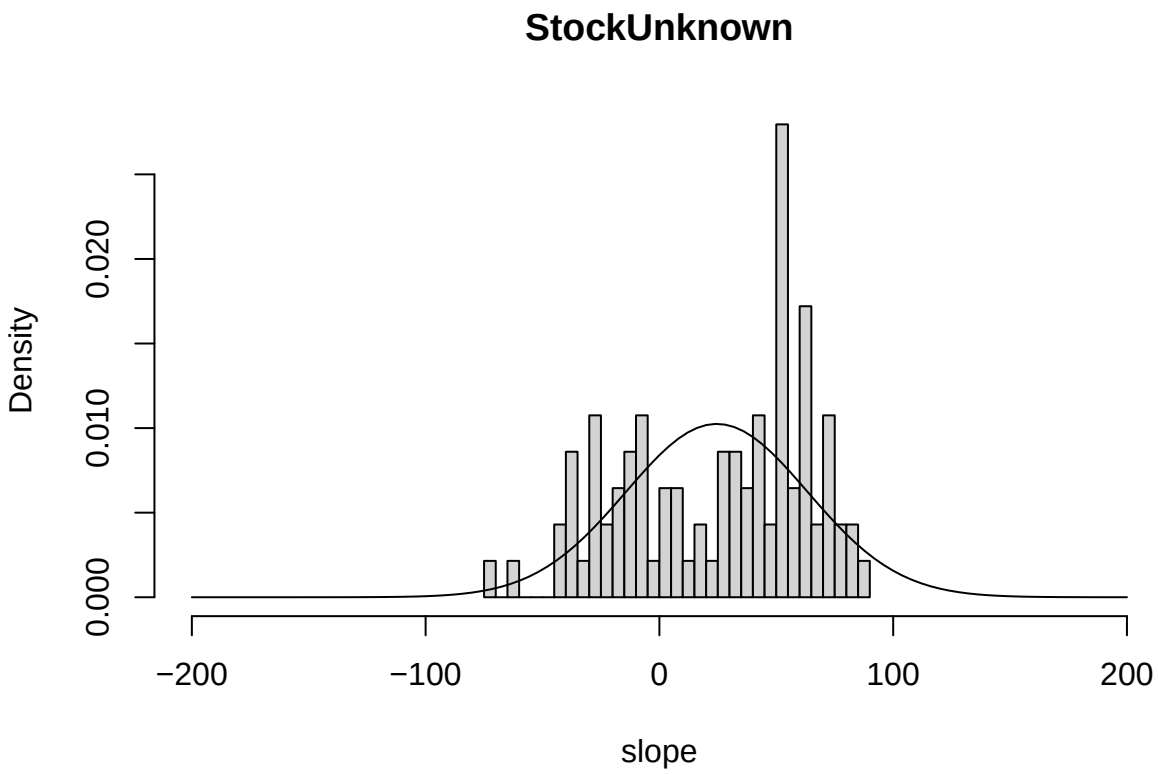



```r
id <- unique(data3$participant_id)

slope <- c()

for (i in id){
x <- as.character(i)
datax <- data3[data3$participant_id == x,]
model <- glm(prediction_recode ~ terminal_streak_length, data = datax)
slope <- c(slope, coef(model)[2])
}
slope <- slope*500

hist(slope,breaks=30,xlim=c(-200,200),prob=TRUE,main="StockUnknown")
curve(dnorm(x, mean = mean(slope), sd = sd(slope)), add = TRUE, col = "black")
```


StockUnknown
Density
0.000
0.010
0.020
−200
−100
0
100
200
slope