Demographic Analysis

08/04/2023

Contents

Basic Setup

```
rm(list = setdiff(ls(), lsf.str()))
library(readxl)
library(ggplot2)
library(fmsb)
library(vcd)
library(explore)
library(corrplot)
library(dplyr)
library(car)
library(rstatix)
library(ggpubr)
library(ez)
library(car)
library(lme4)

demo_data_file <- "../data/PredictingOutcomes_ParticipantDemographics.xlsx"
excel_sheets(demo_data_file)
```

```
## [1] "KEY"      "Study 1A" "Study 1B" "Study 2A" "Study 2B" "Study 3A" "Study 3B"
```

```
pred_data_file <- "../data/PredictingOutcomes_ParticipantPredictions.xlsx"
excel_sheets(pred_data_file)
```

```
## [1] "KEY"      "Study 1A" "Study 1B" "Study 2A" "Study 2B" "Study 3A" "Study 3B"
```

```
strat_data_file <- "../data/PredictingOutcomes_QualitativeStrategyRatings.xlsx"
excel_sheets(strat_data_file)
```

```
## [1] "KEY"      "Study 1A" "Study 1B" "Study 2A" "Study 2B" "Study 3A" "Study 3B"
```

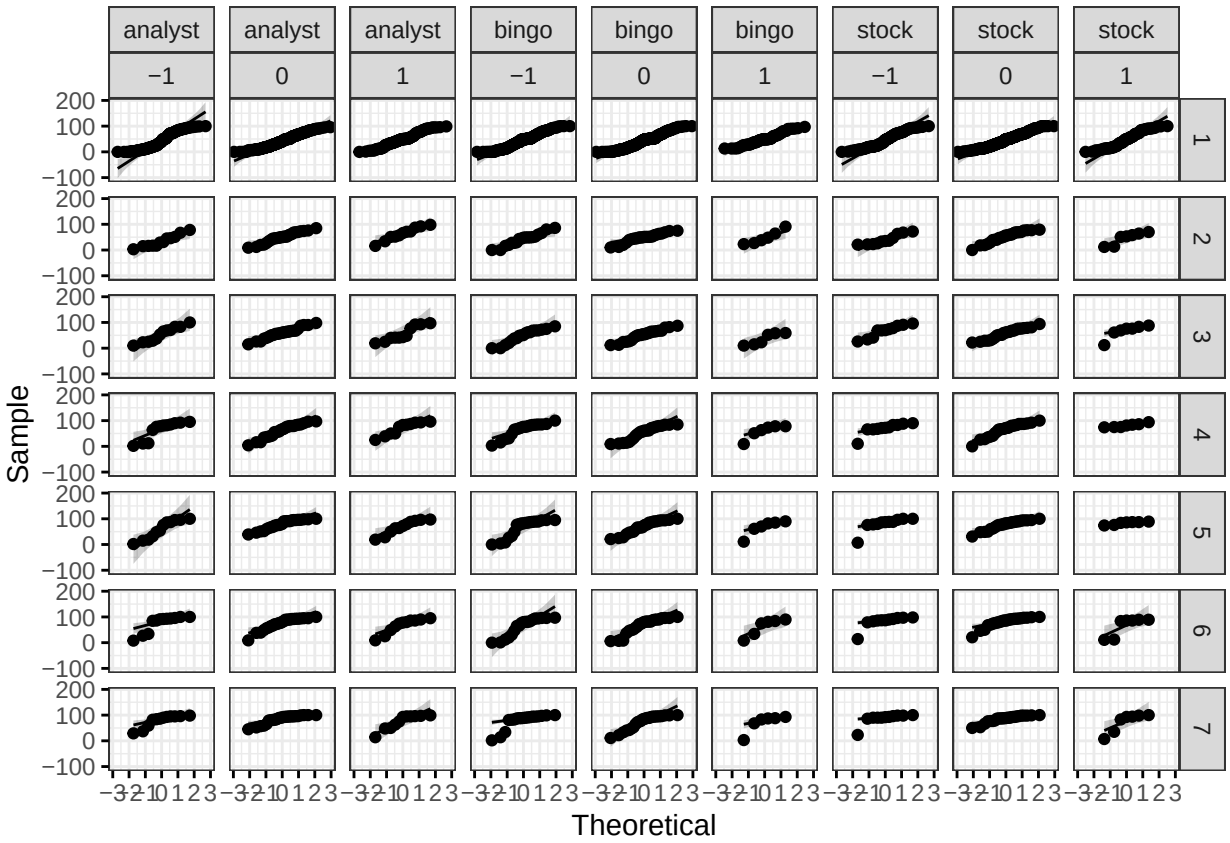
Data Organization

```
read_excel_allsheets <- function(filename, tibble = FALSE) {
    sheets <- excel_sheets(filename)
    x <- lapply(sheets, function(X) read_excel(filename, sheet = X))
    x <- lapply(x, as.data.frame)
    names(x) <- sheets
    x
}

pred_data <- read_excel_allsheets(pred_data_file)
demo_data <- read_excel_allsheets(demo_data_file)

data <- pred_data
for(i in names(pred_data)) {       # for-loop over columns
  if(i == "KEY") {
    next
  }

  data[[i]] <- left_join(pred_data[[i]], demo_data[[i]], by = "participant_id") %>%
    select(-ends_with(".y"), study = study.x, generator = generator.x, rate = rate.x)
  data[[i]]$score_prob <- data[[i]]$score_prob1 + data[[i]]$score_prob2 + data[[i]]$score_prob3
  data[[i]]$score_fin <- data[[i]]$score_fin1 + data[[i]]$score_fin2

}

anova <- function(df, study) {
  df$participant_id <- as.factor(df$participant_id)
  df$generator <- as.factor(df$generator)
  df$terminal_streak_length <- as.factor(df$terminal_streak_length)
  df$gender <- as.factor(df$gender)
  df$stocks <- as.factor(df$stocks)
  df$gambling <- as.factor(df$gambling)

  #outlier detection
  print(df %>%
    group_by(terminal_streak_length, generator, stocks) %>%
    identify_outliers(prediction_recode))

  #Shapiro-Wilk test
  print(df %>%
    group_by(terminal_streak_length, generator, stocks) %>%
    shapiro_test(prediction_recode))

  #Q-Q plot
  print(ggqqplot(df, "prediction_recode", ggtheme = theme_bw()) +
    facet_grid(terminal_streak_length ~ generator + stocks))

  #Levene test for homogeneity of variances
  print(df %>%
    group_by(terminal_streak_length) %>%
    levene_test(prediction_recode ~ generator * stocks))
```

```
  #Box-m test for sphericity
  # print(box_m(df[, "prediction_recode", drop = FALSE], df$generator))

  # aov_orig <- aov(prediction_recode ~ generator * terminal_streak_length + Error(participant_id / ter
  # print(summary(aov_orig))

  # aov_orig <- ezANOVA(
  #   data = df,
  #   dv = prediction_recode,
  #   wid = participant_id,
  #   within = (terminal_streak_length),
  #   between = c(generator),
  #   type = 3
  # )
  # print(aov_orig)

  # ancova <- aov(prediction_recode ~ generator * gender * terminal_streak_length + Error(participant_i
  # print(summary(ancova))

  anova <- ezANOVA(
    data = df,
    dv = prediction_recode,
    wid = participant_id,
    within = (terminal_streak_length),
    between = c(generator, stocks),
    type = 2
  )
  print(anova)

  print("Games-Howell Test")
  print(games_howell_test(df, prediction_recode ~ generator, conf.level = 0.95, detailed = T))
  print(games_howell_test(df, prediction_recode ~ terminal_streak_length, conf.level = 0.95, detailed =
  print(games_howell_test(df, prediction_recode ~ stocks, conf.level = 0.95, detailed = T))

  if (grepl("A", study)) {
    df$prediction_recode <- round(df$prediction_recode / 100)
  }

  print("Regression")
  res = glmer(prediction_recode ~ generator + stocks + terminal_streak_length + (1 | participant_id), da
  X = model.matrix(res) # The X matrix!
  sum = summary(res)
  print(sum)

  betahat = cbind(sum$coef[,1]) # Estimated fixed effects as a column vector.
  estlogodds = X %*% betahat # Estimated pop mean log odds for each observation.
  # Display estimated pop mean log odds by Hand and Spot
  aggmeans = aggregate(estlogodds, by = list(df$generator, df$stocks, df$terminal_streak_length), FUN =
  print(aggmeans)
}

for(i in names(pred_data)) {       # for-loop over columns
  if(i == "KEY") {
```

```
    next
  }

  print(i)
  anova(data[[i]], i)
}
```

```
## [1] "Study 1A"
## # A tibble: 39 x 29
##    generator terminal_s~1 stocks study parti~2 rate  trial seque~3 type  predi~4
##    <fct>     <fct>        <fct>  <chr> <fct>   <chr> <dbl> <chr>   <chr>   <dbl>
##  1 bingo     1            0      1A    178     unkn~    11 111111~ fill~      99
##  2 bingo     1            0      1A    188     unkn~    11 111111~ fill~     100
##  3 bingo     1            0      1A    190     unkn~     2 110001~ fill~       0
##  4 bingo     2            -1     1A    175     unkn~    16 010101~ targ~      14
##  5 bingo     2            0      1A    151     unkn~    16 101101~ targ~      88
##  6 bingo     2            0      1A    163     unkn~     3 010010~ targ~      10
##  7 bingo     2            0      1A    174     unkn~     6 101101~ targ~      80
##  8 analyst   3            0      1A    40      unkn~    17 101010~ targ~      85
##  9 analyst   3            0      1A    147     unkn~     6 010110~ targ~       2
## 10 stock     3            1      1A    26      unkn~     4 101001~ targ~      12
## # ... with 29 more rows, 19 more variables: prediction_recode <dbl>,
## #   response_prob1 <chr>, score_prob1 <dbl>, response_prob2 <chr>,
## #   score_prob2 <dbl>, response_prob3 <chr>, score_prob3 <dbl>,
## #   response_fin1 <dbl>, score_fin1 <dbl>, response_fin2 <dbl>,
## #   score_fin2 <dbl>, age <dbl>, gender <fct>, highest_degree <dbl>,
## #   gambling <fct>, score_prob <dbl>, score_fin <dbl>, is.outlier <lgl>,
## #   is.extreme <lgl>, and abbreviated variable names ...
## # A tibble: 63 x 6
##    generator terminal_streak_length stocks variable          statistic         p
##    <fct>     <fct>                  <fct>  <chr>                 <dbl>     <dbl>
##  1 analyst   1                      -1     prediction_recode     0.925   7.00e-7
##  2 analyst   1                      0      prediction_recode     0.979   1.25e-4
##  3 analyst   1                      1      prediction_recode     0.975   1.58e-2
##  4 bingo     1                      -1     prediction_recode     0.975   5.23e-4
##  5 bingo     1                      0      prediction_recode     0.975   4.54e-5
##  6 bingo     1                      1      prediction_recode     0.967   5.60e-2
##  7 stock     1                      -1     prediction_recode     0.951   1.21e-4
##  8 stock     1                      0      prediction_recode     0.984   1.22e-3
##  9 stock     1                      1      prediction_recode     0.951   2.96e-3
## 10 analyst   2                      -1     prediction_recode     0.934   4.26e-1
## # ... with 53 more rows
```



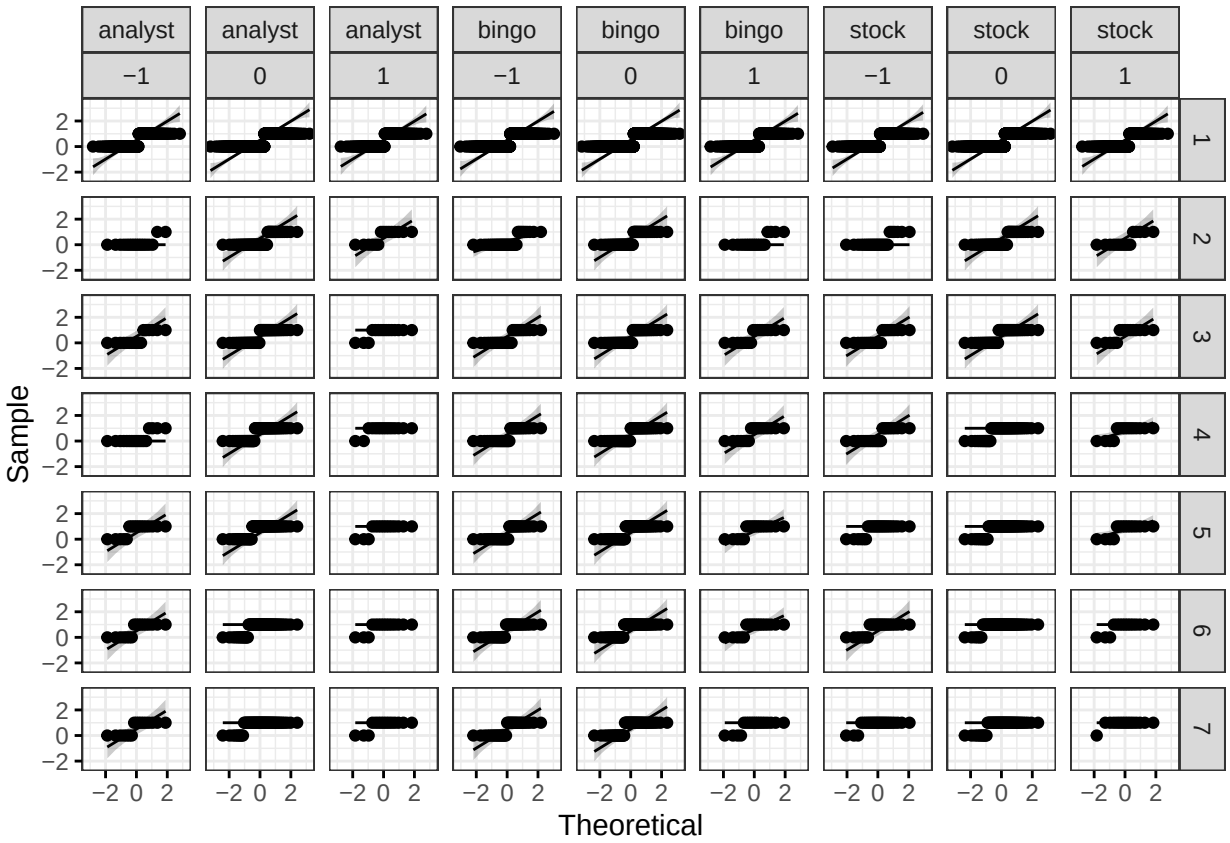

```
## # A tibble: 7 x 5
##   terminal_streak_length   df1   df2 statistic        p
##   <fct>                  <int> <int>     <dbl>    <dbl>
## 1 1                          8  1719     8.37  3.39e-11
## 2 2                          8   135     0.543 8.23e- 1
## 3 3                          8   135     0.826 5.81e- 1
## 4 4                          8   135     0.734 6.61e- 1
## 5 5                          8   135     2.25  2.76e- 2
## 6 6                          8   135     0.805 5.99e- 1
## 7 7                          8   135     1.06  3.98e- 1
## $ANOVA
##                                    Effect DFn DFd           F            p
## 2                               generator   2 135  4.03512270 1.985867e-02
## 3                                  stocks   2 135  0.09347832 9.108167e-01
## 5                  terminal_streak_length   6 810 74.11117834 1.128212e-73
## 4                       generator:stocks   4 135  0.33125266 8.565606e-01
## 6        generator:terminal_streak_length  12 810  1.05831967 3.928066e-01
## 7           stocks:terminal_streak_length  12 810  2.82677017 8.278498e-04
## 8 generator:stocks:terminal_streak_length  24 810  0.90283265 5.988237e-01
##   p<.05          ges
## 2     * 0.0245112030
## 3       0.0005817599
## 5     * 0.2414029881
## 4       0.0041085349
## 6       0.0090066934
## 7     * 0.0237001723
```

```
## 8       0.0152697637
##
## $`Mauchly's Test for Sphericity`
##                                    Effect         W            p p<.05
## 5                  terminal_streak_length 0.5625169 1.606914e-08     *
## 6        generator:terminal_streak_length 0.5625169 1.606914e-08     *
## 7           stocks:terminal_streak_length 0.5625169 1.606914e-08     *
## 8 generator:stocks:terminal_streak_length 0.5625169 1.606914e-08     *
##
## $`Sphericity Corrections`
##                                    Effect       GGe        p[GG] p[GG]<.05
## 5                  terminal_streak_length 0.8355222 5.060128e-62         *
## 6        generator:terminal_streak_length 0.8355222 3.925592e-01
## 7           stocks:terminal_streak_length 0.8355222 1.883359e-03         *
## 8 generator:stocks:terminal_streak_length 0.8355222 5.839456e-01
##         HFe        p[HF] p[HF]<.05
## 5 0.8716087 1.403534e-64         *
## 6 0.8716087 3.926945e-01
## 7 0.8716087 1.571276e-03         *
## 8 0.8716087 5.873943e-01
##
## [1] "Games-Howell Test"
## # A tibble: 3 x 14
##   .y.      group1 group2    n1    n2 estim~1 conf.~2 conf.~3    se stati~4    df
## * <chr>    <chr>  <chr>  <int> <int>   <dbl>   <dbl>   <dbl> <dbl>   <dbl> <dbl>
## 1 predict~ analy~ bingo    900   900   -2.01  -5.00    0.975 0.900    1.58 1795.
## 2 predict~ analy~ stock    900   792    2.56  -0.555   5.68  0.940    1.93 1669.
## 3 predict~ bingo  stock    900   792    4.57   1.51    7.64  0.923    3.50 1653.
## # ... with 3 more variables: p.adj <dbl>, p.adj.signif <chr>, method <chr>, and
## #   abbreviated variable names 1: estimate, 2: conf.low, 3: conf.high,
## #   4: statistic
## # A tibble: 21 x 14
##    .y.     group1 group2    n1    n2 estim~1 conf.~2 conf.~3    se stati~4    df
##  * <chr>   <chr>  <chr>  <int> <int>   <dbl>   <dbl>   <dbl> <dbl>   <dbl> <dbl>
##  1 predic~ 1      2       1728   144    2.34  -3.30     7.98  1.34    1.24  176.
##  2 predic~ 1      3       1728   144   10.0    3.97    16.1   1.43    4.94  171.
##  3 predic~ 1      4       1728   144   18.2   11.6     24.8   1.57    8.18  166.
##  4 predic~ 1      5       1728   144   27.1   20.6     33.5   1.53   12.5   167.
##  5 predic~ 1      6       1728   144   27.1   20.1     34.2   1.66   11.5   163.
##  6 predic~ 1      7       1728   144   34.7   28.5     40.8   1.45   16.9   170.
##  7 predic~ 2      3        144   144    7.67  -0.165   15.5   1.87    2.91  284.
##  8 predic~ 2      4        144   144   15.9    7.56    24.2   1.98    5.67  277.
##  9 predic~ 2      5        144   144   24.7   16.6     32.9   1.94    9.01  280.
## 10 predic~ 2      6        144   144   24.8   16.2     33.4   2.05    8.55  271.
## # ... with 11 more rows, 3 more variables: p.adj <dbl>, p.adj.signif <chr>,
## #   method <chr>, and abbreviated variable names 1: estimate, 2: conf.low,
## #   3: conf.high, 4: statistic
## # A tibble: 3 x 14
##   .y.      group1 group2    n1    n2 estim~1 conf.~2 conf.~3    se stati~4    df
## * <chr>    <chr>  <chr>  <int> <int>   <dbl>   <dbl>   <dbl> <dbl>   <dbl> <dbl>
## 1 predict~ -1     0        756  1404  -0.103  -3.10     2.89 0.903  0.0809 1371.
## 2 predict~ -1     1        756   432   3.09   -0.840    7.02 1.18   1.85    977.
## 3 predict~ 0      1       1404   432   3.19   -0.221    6.61 1.03   2.20    696.
## # ... with 3 more variables: p.adj <dbl>, p.adj.signif <chr>, method <chr>, and
```

```
## #   abbreviated variable names 1: estimate, 2: conf.low, 3: conf.high,
## #   4: statistic
## [1] "Regression"
## Generalized linear mixed model fit by maximum likelihood (Laplace
##   Approximation) [glmerMod]
##  Family: binomial  ( logit )
## Formula: prediction_recode ~ generator + stocks + terminal_streak_length +
##     (1 | participant_id)
##    Data: df
##
##      AIC      BIC   logLik deviance df.resid
##   3295.9   3366.2  -1635.9   3271.9     2580
##
## Scaled residuals:
##     Min      1Q  Median      3Q     Max
## -2.9338 -0.8248  0.3538  1.0206  1.6080
##
## Random effects:
##  Groups         Name        Variance Std.Dev.
##  participant_id (Intercept) 0.09726  0.3119
## Number of obs: 2592, groups:  participant_id, 144
##
## Fixed effects:
##                          Estimate Std. Error z value Pr(>|z|)
## (Intercept)              -0.46340    0.12194  -3.800 0.000145 ***
## generatorbingo           -0.06435    0.12031  -0.535 0.592749
## generatorstock            0.30514    0.12323   2.476 0.013279 *
## stocks0                  -0.02180    0.11467  -0.190 0.849221
## stocks1                   0.08139    0.15386   0.529 0.596799
## terminal_streak_length2  0.27632    0.17660   1.565 0.117665
## terminal_streak_length3  0.97840    0.18308   5.344 9.08e-08 ***
## terminal_streak_length4  1.48239    0.19976   7.421 1.16e-13 ***
## terminal_streak_length5  1.80481    0.21631   8.343  < 2e-16 ***
## terminal_streak_length6  1.76138    0.21379   8.239  < 2e-16 ***
## terminal_streak_length7  2.25929    0.24858   9.089  < 2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Correlation of Fixed Effects:
##             (Intr) gnrtrb gnrtrs stcks0 stcks1 trm__2 trm__3 trm__4 trm__5
## generatrbng -0.573
## genertrstck -0.486  0.483
## stocks0     -0.645  0.102 -0.010
## stocks1     -0.530  0.147  0.054  0.494
## trmnl_str_2 -0.116 -0.001  0.004  0.000  0.001
## trmnl_str_3 -0.115 -0.003  0.012 -0.001  0.002  0.077
## trmnl_str_4 -0.107 -0.004  0.015 -0.001  0.003  0.071  0.072
## trmnl_str_5 -0.100 -0.004  0.016 -0.001  0.003  0.066  0.067  0.063
## trmnl_str_6 -0.101 -0.004  0.016 -0.001  0.003  0.067  0.067  0.064  0.060
## trmnl_str_7 -0.088 -0.004  0.016 -0.001  0.003  0.058  0.059  0.056  0.052
##             trm__6
## generatrbng
## genertrstck
## stocks0
```

```
## stocks1
## trmnl_str_2
## trmnl_str_3
## trmnl_str_4
## trmnl_str_5
## trmnl_str_6
## trmnl_str_7  0.053
##    Group.1 Group.2 Group.3          V1
## 1  analyst      -1       1 -0.46340107
## 2    bingo      -1       1 -0.52774886
## 3    stock      -1       1 -0.15826209
## 4  analyst       0       1 -0.48520159
## 5    bingo       0       1 -0.54954938
## 6    stock       0       1 -0.18006261
## 7  analyst       1       1 -0.38200994
## 8    bingo       1       1 -0.44635772
## 9    stock       1       1 -0.07687096
## 10 analyst      -1       2 -0.18707930
## 11   bingo      -1       2 -0.25142709
## 12   stock      -1       2  0.11805968
## 13 analyst       0       2 -0.20887982
## 14   bingo       0       2 -0.27322761
## 15   stock       0       2  0.09625916
## 16 analyst       1       2 -0.10568816
## 17   bingo       1       2 -0.17003595
## 18   stock       1       2  0.19945082
## 19 analyst      -1       3  0.51500108
## 20   bingo      -1       3  0.45065329
## 21   stock      -1       3  0.82014006
## 22 analyst       0       3  0.49320056
## 23   bingo       0       3  0.42885277
## 24   stock       0       3  0.79833954
## 25 analyst       1       3  0.59639222
## 26   bingo       1       3  0.53204443
## 27   stock       1       3  0.90153120
## 28 analyst      -1       4  1.01898922
## 29   bingo      -1       4  0.95464143
## 30   stock      -1       4  1.32412820
## 31 analyst       0       4  0.99718870
## 32   bingo       0       4  0.93284091
## 33   stock       0       4  1.30232768
## 34 analyst       1       4  1.10038036
## 35   bingo       1       4  1.03603257
## 36   stock       1       4  1.40551934
## 37 analyst      -1       5  1.34140792
## 38   bingo      -1       5  1.27706013
## 39   stock      -1       5  1.64654690
## 40 analyst       0       5  1.31960740
## 41   bingo       0       5  1.25525961
## 42   stock       0       5  1.62474638
## 43 analyst       1       5  1.42279906
## 44   bingo       1       5  1.35845127
## 45   stock       1       5  1.72793804
## 46 analyst      -1       6  1.29798308
```

```
## 47   bingo      -1       6  1.23363529
## 48   stock      -1       6  1.60312206
## 49 analyst       0       6  1.27618256
## 50   bingo       0       6  1.21183477
## 51   stock       0       6  1.58132154
## 52 analyst       1       6  1.37937421
## 53   bingo       1       6  1.31502643
## 54   stock       1       6  1.68451320
## 55 analyst      -1       7  1.79588562
## 56   bingo      -1       7  1.73153783
## 57   stock      -1       7  2.10102460
## 58 analyst       0       7  1.77408510
## 59   bingo       0       7  1.70973731
## 60   stock       0       7  2.07922408
## 61 analyst       1       7  1.87727675
## 62   bingo       1       7  1.81292897
## 63   stock       1       7  2.18241573
## [1] "Study 1B"
## # A tibble: 111 x 29
##    generator terminal_s~1 stocks study parti~2 rate  trial seque~3 type  predi~4
##    <fct>     <fct>        <fct>  <chr> <fct>   <chr> <dbl> <chr>   <chr>   <dbl>
##  1 analyst   2            -1     1B    263     unkn~    11 010101~ targ~       0
##  2 analyst   2            -1     1B    271     unkn~     6 010010~ targ~       1
##  3 bingo     2            1      1B    74      unkn~    15 101101~ targ~       0
##  4 bingo     2            1      1B    106     unkn~    13 101101~ targ~       0
##  5 bingo     2            1      1B    166     unkn~    14 101010~ targ~       1
##  6 bingo     2            1      1B    183     unkn~    13 010101~ targ~       0
##  7 stock     2            -1     1B    30      unkn~     6 101010~ targ~       1
##  8 stock     2            -1     1B    54      unkn~     5 101010~ targ~       1
##  9 stock     2            -1     1B    57      unkn~    17 101101~ targ~       0
## 10 stock     2            -1     1B    62      unkn~     5 010010~ targ~       1
## # ... with 101 more rows, 19 more variables: prediction_recode <dbl>,
## #   response_prob1 <chr>, score_prob1 <dbl>, response_prob2 <chr>,
## #   score_prob2 <dbl>, response_prob3 <chr>, score_prob3 <dbl>,
## #   response_fin1 <dbl>, score_fin1 <dbl>, response_fin2 <dbl>,
## #   score_fin2 <dbl>, age <dbl>, gender <fct>, highest_degree <dbl>,
## #   gambling <fct>, score_prob <dbl>, score_fin <dbl>, is.outlier <lgl>,
## #   is.extreme <lgl>, and abbreviated variable names ...
## # A tibble: 63 x 6
##    generator terminal_streak_length stocks variable          statistic        p
##    <fct>     <fct>                  <fct>  <chr>                 <dbl>    <dbl>
##  1 analyst   1                      -1     prediction_recode     0.632 9.86e-21
##  2 analyst   1                      0      prediction_recode     0.619 8.57e-38
##  3 analyst   1                      1      prediction_recode     0.635 2.00e-19
##  4 bingo     1                      -1     prediction_recode     0.628 3.85e-29
##  5 bingo     1                      0      prediction_recode     0.628 2.04e-35
##  6 bingo     1                      1      prediction_recode     0.615 9.43e-22
##  7 stock     1                      -1     prediction_recode     0.632 6.80e-25
##  8 stock     1                      0      prediction_recode     0.626 5.03e-36
##  9 stock     1                      1      prediction_recode     0.620 8.52e-20
## 10 analyst   2                      -1     prediction_recode     0.385 1.59e- 7
## # ... with 53 more rows
```



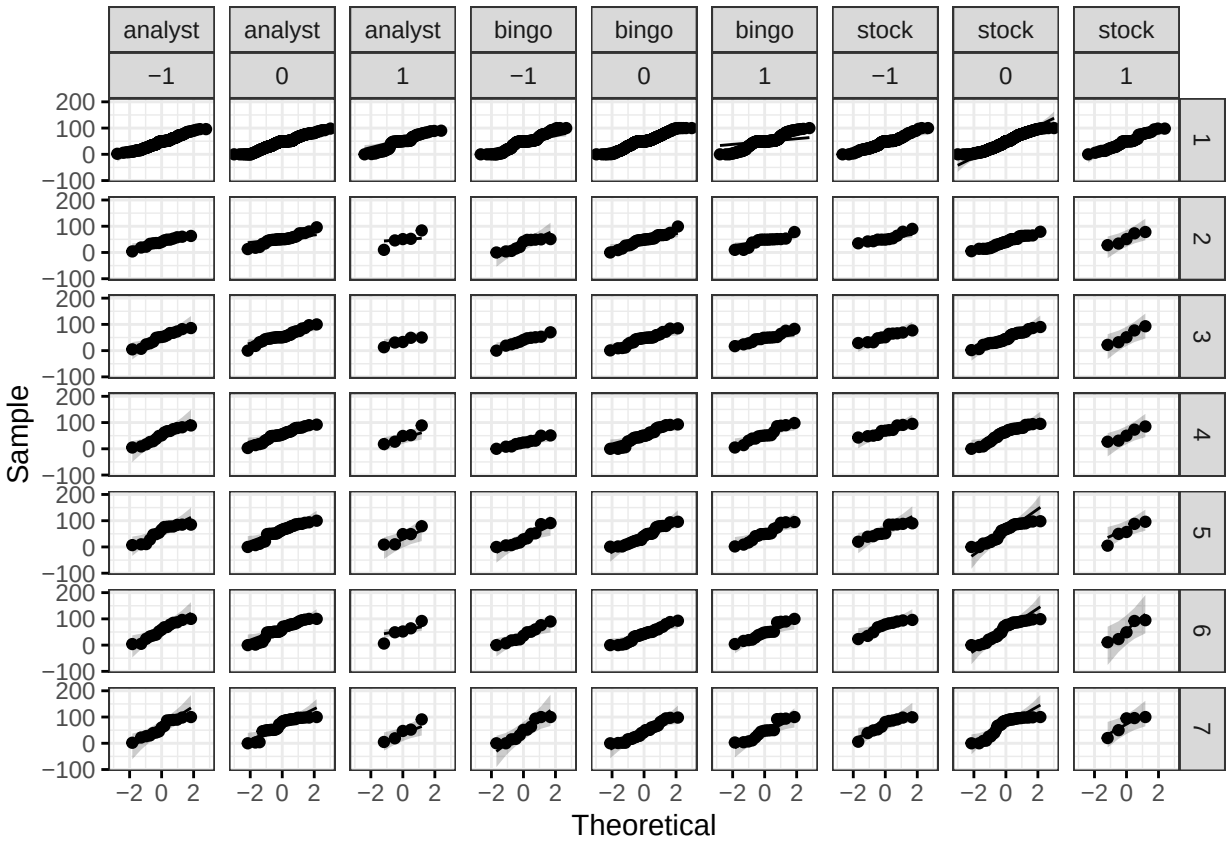

```
## # A tibble: 7 x 5
##   terminal_streak_length   df1   df2 statistic        p
##   <fct>                  <int> <int>     <dbl>    <dbl>
## 1 1                          8  3591     1.01  0.425
## 2 2                          8   291     1.19  0.306
## 3 3                          8   291     0.716 0.677
## 4 4                          8   291     1.70  0.0978
## 5 5                          8   291     1.20  0.297
## 6 6                          8   291     2.38  0.0169
## 7 7                          8   291     3.54  0.000632
## $ANOVA
##                                    Effect DFn  DFd          F            p
## 2                               generator   2  291  4.9276700 7.859248e-03
## 3                                  stocks   2  291  8.1861848 3.476945e-04
## 5                  terminal_streak_length   6 1746 60.9883708 8.395158e-69
## 4                       generator:stocks   4  291  0.7075684 5.873095e-01
## 6        generator:terminal_streak_length  12 1746  1.8999106 3.023505e-02
## 7           stocks:terminal_streak_length  12 1746  2.1555668 1.164081e-02
## 8 generator:stocks:terminal_streak_length  24 1746  1.3826305 1.024329e-01
##   p<.05         ges
## 2     * 0.012459841
## 3     * 0.020529993
## 5     * 0.116219930
## 4       0.003610304
## 6     * 0.008126598
## 7     * 0.009210060
```

```
## 8       0.011784393
##
## $`Mauchly's Test for Sphericity`
##                                    Effect        W            p p<.05
## 5                  terminal_streak_length 0.666783 1.009145e-15     *
## 6        generator:terminal_streak_length 0.666783 1.009145e-15     *
## 7           stocks:terminal_streak_length 0.666783 1.009145e-15     *
## 8 generator:stocks:terminal_streak_length 0.666783 1.009145e-15     *
##
## $`Sphericity Corrections`
##                                    Effect       GGe        p[GG] p[GG]<.05
## 5                  terminal_streak_length 0.8763196 1.201993e-60         *
## 6        generator:terminal_streak_length 0.8763196 3.800901e-02         *
## 7           stocks:terminal_streak_length 0.8763196 1.615890e-02         *
## 8 generator:stocks:terminal_streak_length 0.8763196 1.152752e-01
##         HFe        p[HF] p[HF]<.05
## 5 0.8943449 7.781174e-62         *
## 6 0.8943449 3.675488e-02         *
## 7 0.8943449 1.540089e-02         *
## 8 0.8943449 1.132902e-01
##
## [1] "Games-Howell Test"
## # A tibble: 3 x 14
##   .y.     group1 group2    n1    n2 estim~1 conf.~2 conf.~3     se stati~4    df
## * <chr>   <chr>  <chr>  <int> <int>   <dbl>   <dbl>   <dbl>  <dbl>   <dbl> <dbl>
## 1 predic~ analy~ bingo   1710  1944 -0.0297 -0.0685 0.00907 0.0117    1.80 3589.
## 2 predic~ analy~ stock   1710  1746  0.0198 -0.0200 0.0597  0.0120    1.17 3453.
## 3 predic~ bingo  stock   1944  1746  0.0496  0.0110 0.0881  0.0116    3.01 3642.
## # ... with 3 more variables: p.adj <dbl>, p.adj.signif <chr>, method <chr>, and
## #   abbreviated variable names 1: estimate, 2: conf.low, 3: conf.high,
## #   4: statistic
## # A tibble: 21 x 14
##    .y.        group1 group2    n1    n2 estim~1 conf.low conf.h~2     se stati~3
##  * <chr>      <chr>  <chr>  <int> <int>   <dbl>    <dbl>    <dbl>  <dbl>   <dbl>
##  1 predictio~ 1      2       3600   300 -0.0861 -0.170   -0.00188 0.0201    3.03
##  2 predictio~ 1      3       3600   300  0.0872 -0.00192  0.176   0.0213    2.90
##  3 predictio~ 1      4       3600   300  0.167   0.0792   0.255   0.0210    5.64
##  4 predictio~ 1      5       3600   300  0.277   0.194    0.360   0.0197    9.93
##  5 predictio~ 1      6       3600   300  0.321   0.241    0.400   0.0189   12.0
##  6 predictio~ 1      7       3600   300  0.341   0.263    0.418   0.0185   13.0
##  7 predictio~ 2      3        300   300  0.173   0.0559   0.291   0.0281    4.37
##  8 predictio~ 2      4        300   300  0.253   0.137    0.370   0.0279    6.43
##  9 predictio~ 2      5        300   300  0.363   0.251    0.476   0.0269    9.54
## 10 predictio~ 2      6        300   300  0.407   0.296    0.517   0.0263   10.9
## # ... with 11 more rows, 4 more variables: df <dbl>, p.adj <dbl>,
## #   p.adj.signif <chr>, method <chr>, and abbreviated variable names
## #   1: estimate, 2: conf.high, 3: statistic
## # A tibble: 3 x 14
##   .y.    group1 group2    n1    n2 estim~1 conf.low conf.~2     se stati~3    df
## * <chr>  <chr>  <chr>  <int> <int>   <dbl>    <dbl>   <dbl>  <dbl>   <dbl> <dbl>
## 1 predi~ -1     0       1386  3150  0.0341 -0.00358  0.0717 0.0114    2.12 2657.
## 2 predi~ -1     1       1386   864  0.0559  0.00510  0.107  0.0153    2.58 1823.
## 3 predi~ 0      1       3150   864  0.0218 -0.0233   0.0668 0.0136    1.13 1372.
## # ... with 3 more variables: p.adj <dbl>, p.adj.signif <chr>, method <chr>, and
```

```
## #   abbreviated variable names 1: estimate, 2: conf.high, 3: statistic
## [1] "Regression"
## Generalized linear mixed model fit by maximum likelihood (Laplace
##   Approximation) [glmerMod]
##  Family: binomial  ( logit )
## Formula: prediction_recode ~ generator + stocks + terminal_streak_length +
##     (1 | participant_id)
##    Data: df
##
##      AIC      BIC   logLik deviance df.resid
##   7095.7   7174.8  -3535.8   7071.7     5388
##
## Scaled residuals:
##     Min      1Q  Median      3Q     Max
## -2.2387 -0.8435 -0.6124  0.9948  1.8636
##
## Random effects:
##  Groups         Name        Variance Std.Dev.
##  participant_id (Intercept) 0.1842   0.4292
## Number of obs: 5400, groups:  participant_id, 300
##
## Fixed effects:
##                          Estimate Std. Error z value Pr(>|z|)
## (Intercept)              -0.46350    0.10079  -4.599 4.25e-06 ***
## generatorbingo           -0.11419    0.09351  -1.221  0.22202
## generatorstock            0.09905    0.09503   1.042  0.29725
## stocks0                   0.13534    0.09095   1.488  0.13673
## stocks1                   0.23995    0.12110   1.981  0.04755 *
## terminal_streak_length2 -0.38619    0.13006  -2.969  0.00299 **
## terminal_streak_length3  0.36914    0.12321   2.996  0.00273 **
## terminal_streak_length4  0.70767    0.12485   5.668 1.44e-08 ***
## terminal_streak_length5  1.20861    0.13272   9.106  < 2e-16 ***
## terminal_streak_length6  1.43018    0.13840  10.333  < 2e-16 ***
## terminal_streak_length7  1.53988    0.14176  10.863  < 2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Correlation of Fixed Effects:
##             (Intr) gnrtrb gnrtrs stcks0 stcks1 trm__2 trm__3 trm__4 trm__5
## generatrbng -0.579
## genertrstck -0.528  0.522
## stocks0     -0.699  0.143  0.075
## stocks1     -0.505  0.066  0.043  0.521
## trmnl_str_2 -0.089  0.001 -0.001 -0.002 -0.002
## trmnl_str_3 -0.098 -0.002  0.001  0.002  0.002  0.074
## trmnl_str_4 -0.099 -0.003  0.002  0.003  0.005  0.073  0.079
## trmnl_str_5 -0.095 -0.005  0.004  0.005  0.007  0.068  0.075  0.075
## trmnl_str_6 -0.092 -0.005  0.004  0.006  0.008  0.065  0.072  0.073  0.070
## trmnl_str_7 -0.090 -0.005  0.004  0.006  0.008  0.063  0.070  0.071  0.069
##             trm__6
## generatrbng
## genertrstck
## stocks0
## stocks1
```

```
## trmnl_str_2
## trmnl_str_3
## trmnl_str_4
## trmnl_str_5
## trmnl_str_6
## trmnl_str_7  0.067
##    Group.1 Group.2 Group.3           V1
## 1  analyst      -1       1 -0.463504362
## 2    bingo      -1       1 -0.577697205
## 3    stock      -1       1 -0.364450926
## 4  analyst       0       1 -0.328161107
## 5    bingo       0       1 -0.442353950
## 6    stock       0       1 -0.229107671
## 7  analyst       1       1 -0.223558892
## 8    bingo       1       1 -0.337751735
## 9    stock       1       1 -0.124505456
## 10 analyst      -1       2 -0.849695721
## 11   bingo      -1       2 -0.963888564
## 12   stock      -1       2 -0.750642285
## 13 analyst       0       2 -0.714352466
## 14   bingo       0       2 -0.828545309
## 15   stock       0       2 -0.615299030
## 16 analyst       1       2 -0.609750251
## 17   bingo       1       2 -0.723943094
## 18   stock       1       2 -0.510696815
## 19 analyst      -1       3 -0.094361860
## 20   bingo      -1       3 -0.208554703
## 21   stock      -1       3  0.004691576
## 22 analyst       0       3  0.040981394
## 23   bingo       0       3 -0.073211448
## 24   stock       0       3  0.140034831
## 25 analyst       1       3  0.145583610
## 26   bingo       1       3  0.031390767
## 27   stock       1       3  0.244637046
## 28 analyst      -1       4  0.244170216
## 29   bingo      -1       4  0.129977373
## 30   stock      -1       4  0.343223652
## 31 analyst       0       4  0.379513471
## 32   bingo       0       4  0.265320628
## 33   stock       0       4  0.478566907
## 34 analyst       1       4  0.484115686
## 35   bingo       1       4  0.369922843
## 36   stock       1       4  0.583169122
## 37 analyst      -1       5  0.745106071
## 38   bingo      -1       5  0.630913228
## 39   stock      -1       5  0.844159507
## 40 analyst       0       5  0.880449325
## 41   bingo       0       5  0.766256483
## 42   stock       0       5  0.979502762
## 43 analyst       1       5  0.985051541
## 44   bingo       1       5  0.870858698
## 45   stock       1       5  1.084104977
## 46 analyst      -1       6  0.966671663
## 47   bingo      -1       6  0.852478820
```

```
## 48   stock      -1       6  1.065725099
## 49 analyst       0       6  1.102014918
## 50   bingo       0       6  0.987822075
## 51   stock       0       6  1.201068354
## 52 analyst       1       6  1.206617133
## 53   bingo       1       6  1.092424290
## 54   stock       1       6  1.305670569
## 55 analyst      -1       7  1.076377439
## 56   bingo      -1       7  0.962184596
## 57   stock      -1       7  1.175430875
## 58 analyst       0       7  1.211720693
## 59   bingo       0       7  1.097527851
## 60   stock       0       7  1.310774130
## 61 analyst       1       7  1.316322909
## 62   bingo       1       7  1.202130066
## 63   stock       1       7  1.415376345
## [1] "Study 2A"
## # A tibble: 196 x 29
##    generator terminal_s~1 stocks study parti~2  rate trial seque~3 type  predi~4
##    <fct>     <fct>        <fct>  <chr> <fct>   <dbl> <dbl> <chr>   <chr>   <dbl>
##  1 analyst   1            0      2A    12         50     8 101001~ fill~      14
##  2 analyst   1            0      2A    12         50     9 110100~ fill~      12
##  3 analyst   1            0      2A    14         50     1 101010~ fill~     100
##  4 analyst   1            0      2A    19         50     6 111111~ fill~      92
##  5 analyst   1            0      2A    25         50     2 010101~ fill~       0
##  6 analyst   1            0      2A    25         50     8 110110~ fill~       0
##  7 analyst   1            0      2A    25         50     9 100000~ fill~       0
##  8 analyst   1            0      2A    25         50    10 010111~ fill~       0
##  9 analyst   1            0      2A    25         50    13 110011~ fill~       0
## 10 analyst   1            0      2A    25         50    14 110001~ fill~     100
## # ... with 186 more rows, 19 more variables: prediction_recode <dbl>,
## #   response_prob1 <chr>, score_prob1 <dbl>, response_prob2 <chr>,
## #   score_prob2 <dbl>, response_prob3 <chr>, score_prob3 <dbl>,
## #   response_fin1 <dbl>, score_fin1 <dbl>, response_fin2 <dbl>,
## #   score_fin2 <dbl>, age <dbl>, gender <fct>, highest_degree <dbl>,
## #   gambling <fct>, score_prob <dbl>, score_fin <dbl>, is.outlier <lgl>,
## #   is.extreme <lgl>, and abbreviated variable names ...
## # A tibble: 63 x 6
##    generator terminal_streak_length stocks variable          statistic         p
##    <fct>     <fct>                  <fct>  <chr>                 <dbl>     <dbl>
##  1 analyst   1                      -1     prediction_recode     0.984   3.45e-2
##  2 analyst   1                      0      prediction_recode     0.975   3.08e-6
##  3 analyst   1                      1      prediction_recode     0.920   7.76e-4
##  4 bingo     1                      -1     prediction_recode     0.933   6.16e-6
##  5 bingo     1                      0      prediction_recode     0.964   1.51e-7
##  6 bingo     1                      1      prediction_recode     0.911   2.55e-9
##  7 stock     1                      -1     prediction_recode     0.972   7.13e-3
##  8 stock     1                      0      prediction_recode     0.977   8.15e-6
##  9 stock     1                      1      prediction_recode     0.965   8.44e-2
## 10 analyst   2                      -1     prediction_recode     0.955   6.14e-1
## # ... with 53 more rows
```



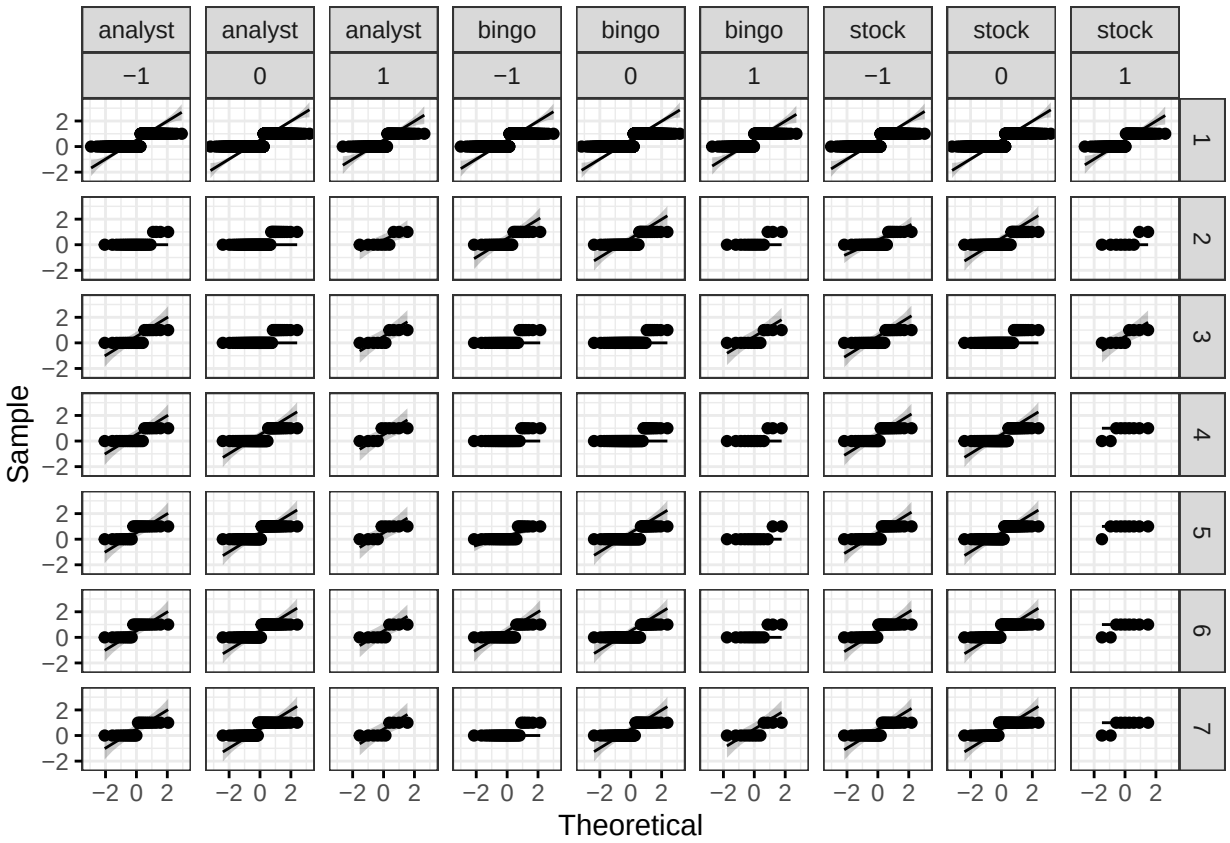

```
## # A tibble: 7 x 5
##   terminal_streak_length   df1   df2 statistic        p
##   <fct>                  <int> <int>     <dbl>    <dbl>
## 1 1                          8  1863     7.67  3.72e-10
## 2 2                          8   147     0.679 7.10e- 1
## 3 3                          8   147     0.810 5.95e- 1
## 4 4                          8   147     0.707 6.85e- 1
## 5 5                          8   147     0.280 9.72e- 1
## 6 6                          8   147     0.631 7.51e- 1
## 7 7                          8   147     0.205 9.90e- 1
## $ANOVA
##                                    Effect DFn DFd         F            p p<.05
## 2                               generator   2 147 6.7949349 1.505013e-03     *
## 3                                  stocks   2 147 0.5149556 5.986010e-01
## 5                  terminal_streak_length   6 882 8.9393866 1.710847e-09     *
## 4                        generator:stocks   4 147 1.6145681 1.736216e-01
## 6        generator:terminal_streak_length  12 882 3.2929671 1.103820e-04     *
## 7           stocks:terminal_streak_length  12 882 0.3300936 9.838900e-01
## 8 generator:stocks:terminal_streak_length  24 882 1.2721012 1.722774e-01
##           ges
## 2 0.040371884
## 3 0.003178177
## 5 0.032075446
## 4 0.019601077
## 6 0.023832265
## 7 0.002441344
```

```
## 8 0.018513539
##
## $`Mauchly's Test for Sphericity`
##                                    Effect         W            p p<.05
## 5                  terminal_streak_length 0.3215569 1.160233e-24     *
## 6        generator:terminal_streak_length 0.3215569 1.160233e-24     *
## 7           stocks:terminal_streak_length 0.3215569 1.160233e-24     *
## 8 generator:stocks:terminal_streak_length 0.3215569 1.160233e-24     *
##
## $`Sphericity Corrections`
##                                    Effect       GGe        p[GG] p[GG]<.05
## 5                  terminal_streak_length 0.6711584 4.790789e-07         *
## 6        generator:terminal_streak_length 0.6711584 1.058258e-03         *
## 7           stocks:terminal_streak_length 0.6711584 9.551125e-01
## 8 generator:stocks:terminal_streak_length 0.6711584 2.087685e-01
##        HFe        p[HF] p[HF]<.05
## 5 0.692425 3.321691e-07         *
## 6 0.692425 9.128582e-04         *
## 7 0.692425 9.580735e-01
## 8 0.692425 2.061098e-01
##
## [1] "Games-Howell Test"
## # A tibble: 3 x 14
##   .y.      group1 group2    n1    n2 estim~1 conf.~2 conf.~3    se stati~4    df
## * <chr>    <chr>  <chr>  <int> <int>   <dbl>   <dbl>   <dbl> <dbl>   <dbl> <dbl>
## 1 predict~ analy~ bingo    936  1008   -1.89  -4.35    0.563 0.740    1.81 1938.
## 2 predict~ analy~ stock    936   864    1.33  -1.38    4.04  0.817    1.15 1718.
## 3 predict~ bingo  stock   1008   864    3.22   0.518   5.93  0.816    2.79 1753.
## # ... with 3 more variables: p.adj <dbl>, p.adj.signif <chr>, method <chr>, and
## #   abbreviated variable names 1: estimate, 2: conf.low, 3: conf.high,
## #   4: statistic
## # A tibble: 21 x 14
##    .y.     group1 group2    n1    n2 estim~1 conf.~2 conf.~3    se stati~4    df
##  * <chr>   <chr>  <chr>  <int> <int>   <dbl>   <dbl>   <dbl> <dbl>   <dbl> <dbl>
##  1 predic~ 1      2       1872   156  -2.56  -7.43      2.30  1.16   1.57   191.
##  2 predic~ 1      3       1872   156   0.737 -4.55      6.02  1.25   0.416  185.
##  3 predic~ 1      4       1872   156   5.17  -1.18     11.5   1.51   2.43   175.
##  4 predic~ 1      5       1872   156   5.28  -1.98     12.5   1.72   2.17   170.
##  5 predic~ 1      6       1872   156   6.24  -1.05     13.5   1.73   2.55   170.
##  6 predic~ 1      7       1872   156  11.3    3.25     19.3   1.90   4.19   167.
##  7 predic~ 2      3        156   156   3.30  -3.52     10.1   1.63   1.44   308.
##  8 predic~ 2      4        156   156   7.74   0.0610   15.4   1.83   2.99   287.
##  9 predic~ 2      5        156   156   7.84  -0.588    16.3   2.01   2.76   267.
## 10 predic~ 2      6        156   156   8.80   0.343    17.3   2.01   3.09   266.
## # ... with 11 more rows, 3 more variables: p.adj <dbl>, p.adj.signif <chr>,
## #   method <chr>, and abbreviated variable names 1: estimate, 2: conf.low,
## #   3: conf.high, 4: statistic
## # A tibble: 3 x 14
##   .y.      group1 group2    n1    n2 estim~1 conf.~2 conf.~3    se stati~4    df
## * <chr>    <chr>  <chr>  <int> <int>   <dbl>   <dbl>   <dbl> <dbl>   <dbl> <dbl>
## 1 predict~ -1     0        666  1674   2.46   -0.123    5.05 0.779   2.23  1231.
## 2 predict~ -1     1        666   468   1.72   -1.66     5.09 1.02    1.19  1013.
## 3 predict~ 0      1       1674   468  -0.746  -3.67     2.18 0.880   0.599  761.
## # ... with 3 more variables: p.adj <dbl>, p.adj.signif <chr>, method <chr>, and
```

```
## #   abbreviated variable names 1: estimate, 2: conf.low, 3: conf.high,
## #   4: statistic
## [1] "Regression"
## Generalized linear mixed model fit by maximum likelihood (Laplace
##   Approximation) [glmerMod]
##  Family: binomial  ( logit )
## Formula: prediction_recode ~ generator + stocks + terminal_streak_length +
##     (1 | participant_id)
##    Data: df
##
##      AIC      BIC   logLik deviance df.resid
##   3779.0   3850.3  -1877.5   3755.0     2796
##
## Scaled residuals:
##     Min      1Q  Median      3Q     Max
## -1.5127 -0.8651 -0.6421  1.0048  2.0149
##
## Random effects:
##  Groups         Name        Variance Std.Dev.
##  participant_id (Intercept) 0.2333   0.483
## Number of obs: 2808, groups:  participant_id, 156
##
## Fixed effects:
##                          Estimate Std. Error z value Pr(>|z|)
## (Intercept)              -0.39304    0.13619  -2.886  0.00390 **
## generatorbingo           -0.28512    0.13633  -2.091  0.03649 *
## generatorstock            0.07760    0.13771   0.564  0.57309
## stocks0                   0.16497    0.13432   1.228  0.21937
## stocks1                  -0.02834    0.18154  -0.156  0.87596
## terminal_streak_length2 -0.09441    0.17571  -0.537  0.59103
## terminal_streak_length3  0.10231    0.17330   0.590  0.55496
## terminal_streak_length4  0.56840    0.17288   3.288  0.00101 **
## terminal_streak_length5  0.43143    0.17224   2.505  0.01225 *
## terminal_streak_length6  0.51352    0.17255   2.976  0.00292 **
## terminal_streak_length7  0.73501    0.17452   4.212 2.54e-05 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Correlation of Fixed Effects:
##             (Intr) gnrtrb gnrtrs stcks0 stcks1 trm__2 trm__3 trm__4 trm__5
## generatrbng -0.435
## genertrstck -0.446  0.487
## stocks0     -0.676 -0.043 -0.055
## stocks1     -0.452 -0.200 -0.035  0.534
## trmnl_str_2 -0.098  0.001  0.000  0.000  0.000
## trmnl_str_3 -0.099 -0.001  0.000  0.001  0.000  0.077
## trmnl_str_4 -0.101 -0.005  0.001  0.003 -0.001  0.077  0.078
## trmnl_str_5 -0.101 -0.004  0.001  0.002  0.000  0.077  0.079  0.080
## trmnl_str_6 -0.101 -0.005  0.001  0.003  0.000  0.077  0.078  0.080  0.080
## trmnl_str_7 -0.100 -0.007  0.002  0.004 -0.001  0.076  0.078  0.079  0.079
##             trm__6
## generatrbng
## genertrstck
## stocks0
```

```
## stocks1
## trmnl_str_2
## trmnl_str_3
## trmnl_str_4
## trmnl_str_5
## trmnl_str_6
## trmnl_str_7  0.079
##    Group.1 Group.2 Group.3           V1
## 1  analyst      -1       1 -0.3930350749
## 2    bingo      -1       1 -0.6781574904
## 3    stock      -1       1 -0.3154330153
## 4  analyst       0       1 -0.2280642842
## 5    bingo       0       1 -0.5131866998
## 6    stock       0       1 -0.1504622247
## 7  analyst       1       1 -0.4213715879
## 8    bingo       1       1 -0.7064940034
## 9    stock       1       1 -0.3437695283
## 10 analyst      -1       2 -0.4874496300
## 11   bingo      -1       2 -0.7725720455
## 12   stock      -1       2 -0.4098475704
## 13 analyst       0       2 -0.3224788393
## 14   bingo       0       2 -0.6076012549
## 15   stock       0       2 -0.2448767798
## 16 analyst       1       2 -0.5157861430
## 17   bingo       1       2 -0.8009085585
## 18   stock       1       2 -0.4381840834
## 19 analyst      -1       3 -0.2907292347
## 20   bingo      -1       3 -0.5758516502
## 21   stock      -1       3 -0.2131271751
## 22 analyst       0       3 -0.1257584440
## 23   bingo       0       3 -0.4108808595
## 24   stock       0       3 -0.0481563844
## 25 analyst       1       3 -0.3190657477
## 26   bingo       1       3 -0.6041881632
## 27   stock       1       3 -0.2414636881
## 28 analyst      -1       4  0.1753678882
## 29   bingo      -1       4 -0.1097545274
## 30   stock      -1       4  0.2529699477
## 31 analyst       0       4  0.3403386788
## 32   bingo       0       4  0.0552162633
## 33   stock       0       4  0.4179407384
## 34 analyst       1       4  0.1470313752
## 35   bingo       1       4 -0.1380910404
## 36   stock       1       4  0.2246334347
## 37 analyst      -1       5  0.0383972657
## 38   bingo      -1       5 -0.2467251499
## 39   stock      -1       5  0.1159993252
## 40 analyst       0       5  0.2033680563
## 41   bingo       0       5 -0.0817543592
## 42   stock       0       5  0.2809701159
## 43 analyst       1       5  0.0100607527
## 44   bingo       1       5 -0.2750616629
## 45   stock       1       5  0.0876628122
## 46 analyst      -1       6  0.1204827477
```

```
## 47   bingo      -1       6 -0.1646396679
## 48   stock      -1       6  0.1980848072
## 49 analyst       0       6  0.2854535383
## 50   bingo       0       6  0.0003311228
## 51   stock       0       6  0.3630555979
## 52 analyst       1       6  0.0921462347
## 53   bingo       1       6 -0.1929761809
## 54   stock       1       6  0.1697482942
## 55 analyst      -1       7  0.3419717266
## 56   bingo      -1       7  0.0568493111
## 57   stock      -1       7  0.4195737862
## 58 analyst       0       7  0.5069425173
## 59   bingo       0       7  0.2218201018
## 60   stock       0       7  0.5845445769
## 61 analyst       1       7  0.3136352136
## 62   bingo       1       7  0.0285127981
## 63   stock       1       7  0.3912372732
## [1] "Study 2B"
## # A tibble: 105 x 29
##    generator terminal_s~1 stocks study parti~2  rate trial seque~3 type  predi~4
##    <fct>     <fct>        <fct>  <chr> <fct>   <dbl> <dbl> <chr>   <chr>   <dbl>
##  1 analyst   2            -1     2B    7          50    16 010101~ targ~       0
##  2 analyst   2            -1     2B    40         50     2 010010~ targ~       1
##  3 analyst   2            -1     2B    174        50    11 101010~ targ~       1
##  4 analyst   2            -1     2B    297        50    12 010101~ targ~       0
##  5 analyst   2            0      2B    16         50     2 101010~ targ~       1
##  6 analyst   2            0      2B    19         50    15 010101~ targ~       0
##  7 analyst   2            0      2B    73         50    11 101010~ targ~       1
##  8 analyst   2            0      2B    79         50    18 010010~ targ~       1
##  9 analyst   2            0      2B    86         50     9 010101~ targ~       0
## 10 analyst   2            0      2B    103        50     6 101010~ targ~       1
## # ... with 95 more rows, 19 more variables: prediction_recode <dbl>,
## #   response_prob1 <chr>, score_prob1 <dbl>, response_prob2 <chr>,
## #   score_prob2 <dbl>, response_prob3 <chr>, score_prob3 <dbl>,
## #   response_fin1 <dbl>, score_fin1 <dbl>, response_fin2 <dbl>,
## #   score_fin2 <dbl>, age <dbl>, gender <fct>, highest_degree <dbl>,
## #   gambling <fct>, score_prob <dbl>, score_fin <dbl>, is.outlier <lgl>,
## #   is.extreme <lgl>, and abbreviated variable names ...
## # A tibble: 63 x 6
##    generator terminal_streak_length stocks variable          statistic        p
##    <fct>     <fct>                  <fct>  <chr>                 <dbl>    <dbl>
##  1 analyst   1                      -1     prediction_recode     0.621 3.20e-25
##  2 analyst   1                      0      prediction_recode     0.624 2.39e-37
##  3 analyst   1                      1      prediction_recode     0.624 4.51e-16
##  4 bingo     1                      -1     prediction_recode     0.632 1.75e-27
##  5 bingo     1                      0      prediction_recode     0.629 6.48e-36
##  6 bingo     1                      1      prediction_recode     0.636 4.57e-18
##  7 stock     1                      -1     prediction_recode     0.630 1.06e-28
##  8 stock     1                      0      prediction_recode     0.623 6.84e-37
##  9 stock     1                      1      prediction_recode     0.636 5.60e-15
## 10 analyst   2                      -1     prediction_recode     0.445 1.11e- 8
## # ... with 53 more rows
```



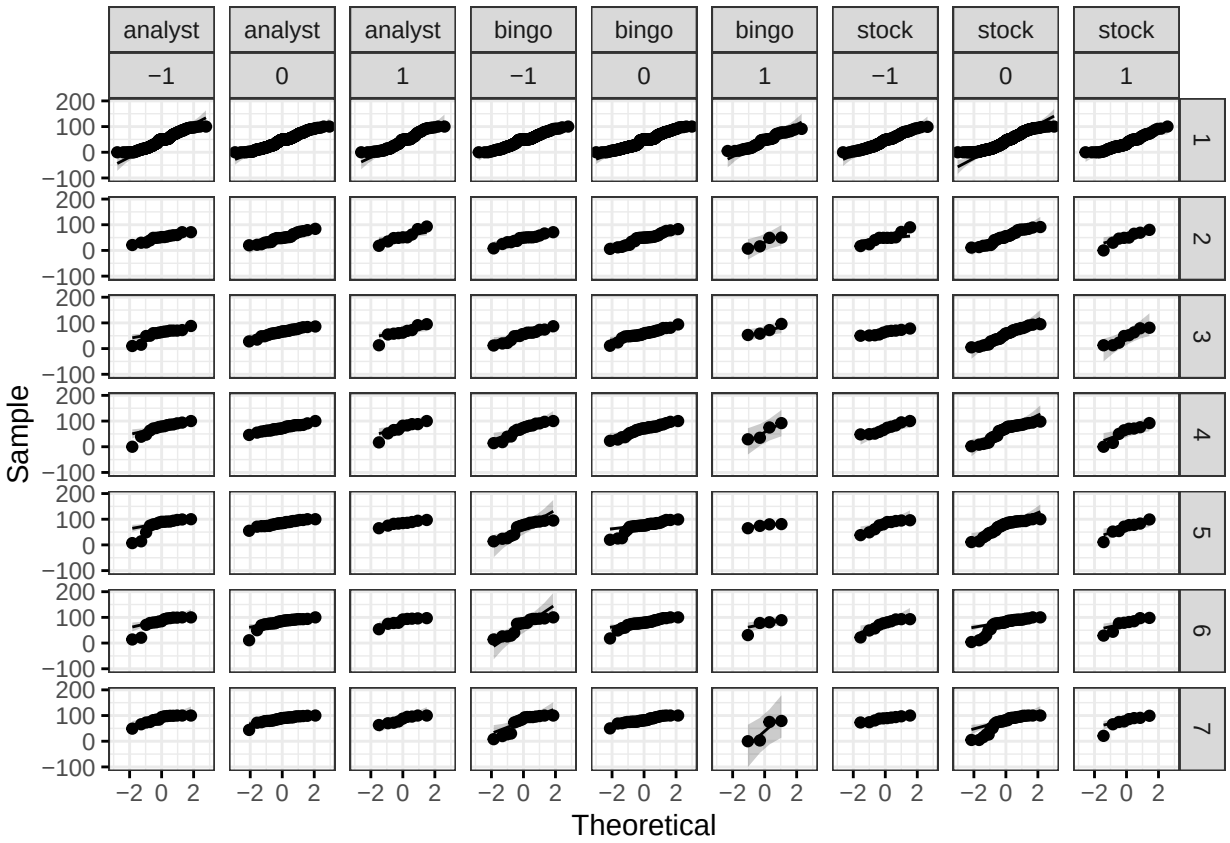

```
## # A tibble: 7 x 5
##   terminal_streak_length   df1   df2 statistic      p
##   <fct>                  <int> <int>     <dbl>  <dbl>
## 1 1                          8  3603     1.03   0.413
## 2 2                          8   292     0.418  0.910
## 3 3                          8   292     1.06   0.388
## 4 4                          8   292     1.06   0.388
## 5 5                          8   292     1.73   0.0900
## 6 6                          8   292     1.89   0.0607
## 7 7                          8   292     1.10   0.361
## $ANOVA
##                                    Effect DFn  DFd          F            p
## 2                               generator   2  292  7.0131293 1.059564e-03
## 3                                  stocks   2  292  1.3612009 2.579745e-01
## 5                  terminal_streak_length   6 1752 16.9092025 4.599426e-19
## 4                       generator:stocks   4  292  0.9626464 4.283060e-01
## 6        generator:terminal_streak_length  12 1752  4.4544077 4.464536e-07
## 7           stocks:terminal_streak_length  12 1752  1.9970836 2.118250e-02
## 8 generator:stocks:terminal_streak_length  24 1752  0.9172281 5.784690e-01
##   p<.05         ges
## 2     * 0.018550357
## 3       0.003655142
## 5     * 0.033930638
## 4       0.005162042
## 6     * 0.018168436
## 7     * 0.008228083
```

```
## 8       0.007563117
##
## $`Mauchly's Test for Sphericity`
##                                   Effect         W            p p<.05
## 5                  terminal_streak_length 0.6757105 4.346359e-15     *
## 6        generator:terminal_streak_length 0.6757105 4.346359e-15     *
## 7           stocks:terminal_streak_length 0.6757105 4.346359e-15     *
## 8 generator:stocks:terminal_streak_length 0.6757105 4.346359e-15     *
##
## $`Sphericity Corrections`
##                                   Effect       GGe        p[GG] p[GG]<.05
## 5                  terminal_streak_length 0.8644596 8.462654e-17         *
## 6        generator:terminal_streak_length 0.8644596 2.266043e-06         *
## 7           stocks:terminal_streak_length 0.8644596 2.833609e-02         *
## 8 generator:stocks:terminal_streak_length 0.8644596 5.675613e-01
##         HFe        p[HF] p[HF]<.05
## 5 0.8819444 4.316512e-17         *
## 6 0.8819444 1.836803e-06         *
## 7 0.8819444 2.728558e-02         *
## 8 0.8819444 5.690420e-01
##
## [1] "Games-Howell Test"
## # A tibble: 3 x 14
##   .y.    group1 group2    n1    n2 estim~1 conf.low conf.~2     se stati~3    df
## * <chr>  <chr>  <chr>  <int> <int>   <dbl>    <dbl>   <dbl>  <dbl>   <dbl> <dbl>
## 1 predi~ analy~ bingo   1746  1818 -0.0203 -5.86e-2  0.0181 0.0116    1.24 3553.
## 2 predi~ analy~ stock   1746  1854  0.0171 -2.14e-2  0.0555 0.0116    1.04 3588.
## 3 predi~ bingo  stock   1818  1854  0.0374 -5.05e-4  0.0753 0.0114    2.31 3670.
## # ... with 3 more variables: p.adj <dbl>, p.adj.signif <chr>, method <chr>, and
## #   abbreviated variable names 1: estimate, 2: conf.high, 3: statistic
## # A tibble: 21 x 14
##    .y.   group1 group2    n1    n2 estimate conf.~1 conf.~2     se stati~3    df
##  * <chr> <chr>  <chr>  <int> <int>    <dbl>   <dbl>   <dbl>  <dbl>   <dbl> <dbl>
##  1 pred~ 1      2       3612   301 -0.157   -0.237  -0.0778 0.0189   5.87   365.
##  2 pred~ 1      3       3612   301 -0.181   -0.258  -0.103  0.0184   6.92   370.
##  3 pred~ 1      4       3612   301 -0.104   -0.188  -0.0207 0.0199   3.70   358.
##  4 pred~ 1      5       3612   301 -0.0144  -0.102   0.0732 0.0209   0.487  352.
##  5 pred~ 1      6       3612   301  0.00886 -0.0794  0.0971 0.0210   0.298  351.
##  6 pred~ 1      7       3612   301  0.0321  -0.0566  0.121  0.0211   1.07   351.
##  7 pred~ 2      3        301   301 -0.0233  -0.128   0.0819 0.0251   0.654  599.
##  8 pred~ 2      4        301   301  0.0532  -0.0565  0.163  0.0262   1.43   598.
##  9 pred~ 2      5        301   301  0.143    0.0300  0.256  0.0270   3.74   593.
## 10 pred~ 2      6        301   301  0.166    0.0527  0.279  0.0271   4.34   592.
## # ... with 11 more rows, 3 more variables: p.adj <dbl>, p.adj.signif <chr>,
## #   method <chr>, and abbreviated variable names 1: conf.low, 2: conf.high,
## #   3: statistic
## # A tibble: 3 x 14
##   .y.    group1 group2    n1    n2 estim~1 conf.low conf.~2     se stati~3    df
## * <chr>  <chr>  <chr>  <int> <int>   <dbl>    <dbl>   <dbl>  <dbl>   <dbl> <dbl>
## 1 predi~ -1     0       1620  3222 -0.0114 -0.0464   0.0235 0.0105   0.766 3229.
## 2 predi~ -1     1       1620   576  0.0519 -0.00461  0.108  0.0170   2.16   997.
## 3 predi~ 0      1       3222   576  0.0633  0.0105   0.116  0.0159   2.82   785.
## # ... with 3 more variables: p.adj <dbl>, p.adj.signif <chr>, method <chr>, and
## #   abbreviated variable names 1: estimate, 2: conf.high, 3: statistic
```

```
## [1] "Regression"
## Generalized linear mixed model fit by maximum likelihood (Laplace
##   Approximation) [glmerMod]
##  Family: binomial  ( logit )
## Formula: prediction_recode ~ generator + stocks + terminal_streak_length +
##     (1 | participant_id)
##    Data: df
##
##      AIC      BIC   logLik deviance df.resid
##   7192.8   7272.0  -3584.4   7168.8     5406
##
## Scaled residuals:
##     Min      1Q  Median      3Q     Max
## -1.1647 -0.8191 -0.6518  1.0999  2.1147
##
## Random effects:
##  Groups         Name        Variance Std.Dev.
##  participant_id (Intercept) 0.1297   0.3601
## Number of obs: 5418, groups:  participant_id, 301
##
## Fixed effects:
##                          Estimate Std. Error z value Pr(>|z|)
## (Intercept)              -0.30887    0.08642  -3.574 0.000352 ***
## generatorbingo           -0.09826    0.08713  -1.128 0.259390
## generatorstock            0.07458    0.08633   0.864 0.387677
## stocks0                  -0.04976    0.07905  -0.629 0.529036
## stocks1                   0.23540    0.12481   1.886 0.059282 .
## terminal_streak_length2 -0.72792    0.13661  -5.328 9.92e-08 ***
## terminal_streak_length3 -0.85400    0.14046  -6.080 1.20e-09 ***
## terminal_streak_length4 -0.46296    0.13011  -3.558 0.000373 ***
## terminal_streak_length5 -0.06130    0.12402  -0.494 0.621085
## terminal_streak_length6  0.03742    0.12318   0.304 0.761300
## terminal_streak_length7  0.13493    0.12260   1.101 0.271097
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Correlation of Fixed Effects:
##             (Intr) gnrtrb gnrtrs stcks0 stcks1 trm__2 trm__3 trm__4 trm__5
## generatrbng -0.539
## genertrstck -0.557  0.513
## stocks0     -0.646  0.053  0.061
## stocks1     -0.396 -0.009  0.045  0.420
## trmnl_str_2 -0.099  0.002 -0.002  0.001 -0.004
## trmnl_str_3 -0.096  0.002 -0.002  0.001 -0.004  0.062
## trmnl_str_4 -0.104  0.002 -0.001  0.001 -0.003  0.067  0.065
## trmnl_str_5 -0.109  0.000  0.000  0.000  0.000  0.069  0.067  0.073
## trmnl_str_6 -0.110  0.000  0.000  0.000  0.000  0.070  0.068  0.073  0.077
## trmnl_str_7 -0.111  0.000  0.000  0.000  0.001  0.070  0.068  0.073  0.077
##             trm__6
## generatrbng
## genertrstck
## stocks0
## stocks1
## trmnl_str_2
```

```
## trmnl_str_3
## trmnl_str_4
## trmnl_str_5
## trmnl_str_6
## trmnl_str_7  0.078
##    Group.1 Group.2 Group.3           V1
## 1  analyst      -1       1 -0.308866638
## 2    bingo      -1       1 -0.407130377
## 3    stock      -1       1 -0.234290156
## 4  analyst       0       1 -0.358627579
## 5    bingo       0       1 -0.456891318
## 6    stock       0       1 -0.284051097
## 7  analyst       1       1 -0.073466848
## 8    bingo       1       1 -0.171730587
## 9    stock       1       1  0.001109633
## 10 analyst      -1       2 -1.036783514
## 11   bingo      -1       2 -1.135047254
## 12   stock      -1       2 -0.962207033
## 13 analyst       0       2 -1.086544455
## 14   bingo       0       2 -1.184808195
## 15   stock       0       2 -1.011967974
## 16 analyst       1       2 -0.801383725
## 17   bingo       1       2 -0.899647464
## 18   stock       1       2 -0.726807243
## 19 analyst      -1       3 -1.162866651
## 20   bingo      -1       3 -1.261130390
## 21   stock      -1       3 -1.088290170
## 22 analyst       0       3 -1.212627592
## 23   bingo       0       3 -1.310891331
## 24   stock       0       3 -1.138051110
## 25 analyst       1       3 -0.927466861
## 26   bingo       1       3 -1.025730600
## 27   stock       1       3 -0.852890380
## 28 analyst      -1       4 -0.771825283
## 29   bingo      -1       4 -0.870089022
## 30   stock      -1       4 -0.697248802
## 31 analyst       0       4 -0.821586224
## 32   bingo       0       4 -0.919849963
## 33   stock       0       4 -0.747009743
## 34 analyst       1       4 -0.536425493
## 35   bingo       1       4 -0.634689233
## 36   stock       1       4 -0.461849012
## 37 analyst      -1       5 -0.370169389
## 38   bingo      -1       5 -0.468433128
## 39   stock      -1       5 -0.295592908
## 40 analyst       0       5 -0.419930330
## 41   bingo       0       5 -0.518194069
## 42   stock       0       5 -0.345353848
## 43 analyst       1       5 -0.134769599
## 44   bingo       1       5 -0.233033339
## 45   stock       1       5 -0.060193118
## 46 analyst      -1       6 -0.271448069
## 47   bingo      -1       6 -0.369711808
## 48   stock      -1       6 -0.196871588
```

```
## 49 analyst       0       6 -0.321209010
## 50   bingo       0       6 -0.419472749
## 51   stock       0       6 -0.246632528
## 52 analyst       1       6 -0.036048279
## 53   bingo       1       6 -0.134312018
## 54   stock       1       6  0.038528202
## 55 analyst      -1       7 -0.173940686
## 56   bingo      -1       7 -0.272204426
## 57   stock      -1       7 -0.099364205
## 58 analyst       0       7 -0.223701627
## 59   bingo       0       7 -0.321965366
## 60   stock       0       7 -0.149125146
## 61 analyst       1       7  0.061459103
## 62   bingo       1       7 -0.036804636
## 63   stock       1       7  0.136035585
## [1] "Study 3A"
## # A tibble: 60 x 29
##    generator terminal_s~1 stocks study parti~2 rate  trial seque~3 type  predi~4
##    <fct>     <fct>        <fct>  <chr> <fct>   <chr> <dbl> <chr>   <chr>   <dbl>
##  1 stock     1            1      3A    76      25-5~     6 111111~ fill~     100
##  2 analyst   2            -1     3A    133     25-5~    18 010101~ targ~      79
##  3 analyst   2            1      3A    34      25-5~     2 101010~ targ~      18
##  4 analyst   2            1      3A    134     25-5~    18 010010~ targ~      93
##  5 bingo     2            -1     3A    112     25-5~     8 010010~ targ~       8
##  6 bingo     2            0      3A    115     25-5~     2 101010~ targ~      83
##  7 bingo     2            0      3A    117     25-5~     5 101101~ targ~      94
##  8 stock     2            -1     3A    52      25-5~    13 010101~ targ~      10
##  9 stock     2            -1     3A    57      25-5~     2 010010~ targ~      17
## 10 stock     2            -1     3A    83      25-5~     6 101101~ targ~      28
## # ... with 50 more rows, 19 more variables: prediction_recode <dbl>,
## #   response_prob1 <chr>, score_prob1 <dbl>, response_prob2 <chr>,
## #   score_prob2 <dbl>, response_prob3 <chr>, score_prob3 <dbl>,
## #   response_fin1 <dbl>, score_fin1 <dbl>, response_fin2 <dbl>,
## #   score_fin2 <dbl>, age <dbl>, gender <fct>, highest_degree <dbl>,
## #   gambling <fct>, score_prob <dbl>, score_fin <dbl>, is.outlier <lgl>,
## #   is.extreme <lgl>, and abbreviated variable names ...
## # A tibble: 63 x 6
##    generator terminal_streak_length stocks variable          statistic         p
##    <fct>     <fct>                  <fct>  <chr>                 <dbl>     <dbl>
##  1 analyst   1                      -1     prediction_recode     0.966   2.28e-4
##  2 analyst   1                      0      prediction_recode     0.979   1.79e-4
##  3 analyst   1                      1      prediction_recode     0.954   9.78e-4
##  4 bingo     1                      -1     prediction_recode     0.976   2.17e-3
##  5 bingo     1                      0      prediction_recode     0.969   6.87e-7
##  6 bingo     1                      1      prediction_recode     0.949   3.53e-2
##  7 stock     1                      -1     prediction_recode     0.979   5.40e-2
##  8 stock     1                      0      prediction_recode     0.961   1.65e-8
##  9 stock     1                      1      prediction_recode     0.966   1.38e-2
## 10 analyst   2                      -1     prediction_recode     0.942   4.11e-1
## # ... with 53 more rows
```



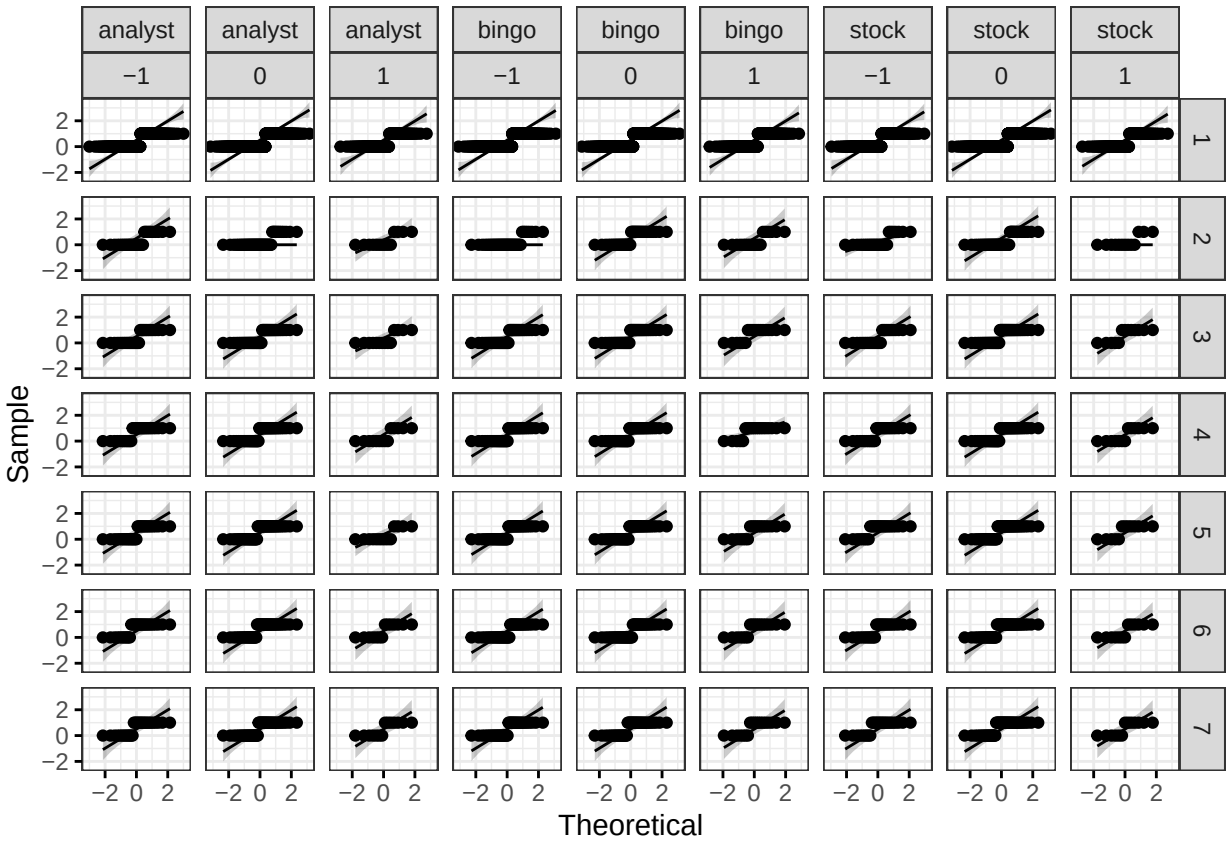

```
## # A tibble: 7 x 5
##   terminal_streak_length   df1   df2 statistic           p
##   <fct>                  <int> <int>     <dbl>       <dbl>
## 1 1                          8  1791     5.76  0.000000286
## 2 2                          8   141     0.927 0.496
## 3 3                          8   141     2.30  0.0238
## 4 4                          8   141     1.52  0.154
## 5 5                          8   141     1.61  0.128
## 6 6                          8   141     0.967 0.464
## 7 7                          8   141     3.56  0.000880
## $ANOVA
##                                    Effect DFn DFd           F             p
## 2                               generator   2 141   4.0640179  1.923167e-02
## 3                                  stocks   2 141   0.6261194  5.361424e-01
## 5                  terminal_streak_length   6 846 110.7529114 5.643708e-103
## 4                       generator:stocks   4 141   0.8660732  4.860508e-01
## 6        generator:terminal_streak_length  12 846   1.4632823  1.323464e-01
## 7           stocks:terminal_streak_length  12 846   0.8028209  6.478689e-01
## 8 generator:stocks:terminal_streak_length  24 846   1.4205284  8.726633e-02
##   p<.05         ges
## 2     * 0.024694831
## 3       0.003885762
## 5     * 0.305781629
## 4       0.010676596
## 6       0.011505160
## 7       0.006345186
```

```
## 8       0.022098618
##
## $`Mauchly's Test for Sphericity`
##                                    Effect         W           p p<.05
## 5                  terminal_streak_length 0.5492728 1.14842e-09     *
## 6        generator:terminal_streak_length 0.5492728 1.14842e-09     *
## 7           stocks:terminal_streak_length 0.5492728 1.14842e-09     *
## 8 generator:stocks:terminal_streak_length 0.5492728 1.14842e-09     *
##
## $`Sphericity Corrections`
##                                    Effect       GGe        p[GG] p[GG]<.05
## 5                  terminal_streak_length 0.8390383 7.116677e-87         *
## 6        generator:terminal_streak_length 0.8390383 1.481461e-01
## 7           stocks:terminal_streak_length 0.8390383 6.269023e-01
## 8 generator:stocks:terminal_streak_length 0.8390383 1.039441e-01
##         HFe        p[HF] p[HF]<.05
## 5 0.8738237 2.356425e-90         *
## 6 0.8738237 1.445490e-01
## 7 0.8738237 6.317030e-01
## 8 0.8738237 1.000483e-01
##
## [1] "Games-Howell Test"
## # A tibble: 3 x 14
##   .y.      group1 group2    n1    n2 estim~1 conf.~2 conf.~3    se stati~4    df
## * <chr>    <chr>  <chr>  <int> <int>   <dbl>   <dbl>   <dbl> <dbl>   <dbl> <dbl>
## 1 predict~ analy~ bingo    900   900   -2.23   -5.12   0.659 0.871    1.81 1783.
## 2 predict~ analy~ stock    900   900   -3.85   -6.92  -0.768 0.928    2.93 1796.
## 3 predict~ bingo  stock    900   900   -1.61   -4.56   1.34  0.889    1.28 1769.
## # ... with 3 more variables: p.adj <dbl>, p.adj.signif <chr>, method <chr>, and
## #   abbreviated variable names 1: estimate, 2: conf.low, 3: conf.high,
## #   4: statistic
## # A tibble: 21 x 14
##    .y.     group1 group2    n1    n2 estim~1 conf.~2 conf.~3    se stati~4    df
##  * <chr>   <chr>  <chr>  <int> <int>   <dbl>   <dbl>   <dbl> <dbl>   <dbl> <dbl>
##  1 predic~ 1      2       1800   150    4.45  -0.700    9.61  1.22    2.58  190.
##  2 predic~ 1      3       1800   150   13.2    7.91    18.5   1.26    7.42  187.
##  3 predic~ 1      4       1800   150   22.5   16.6     28.5   1.41   11.3   178.
##  4 predic~ 1      5       1800   150   30.6   25.0     36.2   1.34   16.2   182.
##  5 predic~ 1      6       1800   150   32.0   26.3     37.7   1.36   16.7   181.
##  6 predic~ 1      7       1800   150   35.2   29.4     40.9   1.36   18.3   181.
##  7 predic~ 2      3        150   150    8.76   1.81    15.7   1.66    3.74  298.
##  8 predic~ 2      4        150   150   18.1   10.6     25.5   1.77    7.22  291.
##  9 predic~ 2      5        150   150   26.2   19.0     33.4   1.72   10.8   295.
## 10 predic~ 2      6        150   150   27.6   20.3     34.8   1.73   11.2   294.
## # ... with 11 more rows, 3 more variables: p.adj <dbl>, p.adj.signif <chr>,
## #   method <chr>, and abbreviated variable names 1: estimate, 2: conf.low,
## #   3: conf.high, 4: statistic
## # A tibble: 3 x 14
##   .y.      group1 group2    n1    n2 estim~1 conf.~2 conf.~3    se stati~4    df
## * <chr>    <chr>  <chr>  <int> <int>   <dbl>   <dbl>   <dbl> <dbl>   <dbl> <dbl>
## 1 predict~ -1     0        738  1584  -0.609   -3.40   2.18  0.841   0.512 1436.
## 2 predict~ -1     1        738   378  -3.26    -7.40   0.875 1.25    1.85   720.
## 3 predict~ 0      1       1584   378  -2.65    -6.43   1.13  1.14    1.65   546.
## # ... with 3 more variables: p.adj <dbl>, p.adj.signif <chr>, method <chr>, and
```

```
## #   abbreviated variable names 1: estimate, 2: conf.low, 3: conf.high,
## #   4: statistic
## [1] "Regression"
## Generalized linear mixed model fit by maximum likelihood (Laplace
##   Approximation) [glmerMod]
##  Family: binomial  ( logit )
## Formula: prediction_recode ~ generator + stocks + terminal_streak_length +
##     (1 | participant_id)
##    Data: df
##
##      AIC      BIC   logLik deviance df.resid
##   3315.1   3385.9  -1645.5   3291.1     2688
##
## Scaled residuals:
##     Min      1Q  Median      3Q     Max
## -3.1691 -0.8206  0.3238  1.1152  1.6468
##
## Random effects:
##  Groups         Name        Variance Std.Dev.
##  participant_id (Intercept) 0.06723  0.2593
## Number of obs: 2700, groups:  participant_id, 150
##
## Fixed effects:
##                          Estimate Std. Error z value Pr(>|z|)
## (Intercept)             -0.279634   0.112903  -2.477   0.0133 *
## generatorbingo          -0.143474   0.116170  -1.235   0.2168
## generatorstock          -0.223058   0.116185  -1.920   0.0549 .
## stocks0                  0.002053   0.109706   0.019   0.9851
## stocks1                 -0.211866   0.156814  -1.351   0.1767
## terminal_streak_length2  0.211564   0.172842   1.224   0.2209
## terminal_streak_length3  1.325947   0.187685   7.065 1.61e-12 ***
## terminal_streak_length4  1.798899   0.209364   8.592  < 2e-16 ***
## terminal_streak_length5  2.219635   0.237745   9.336  < 2e-16 ***
## terminal_streak_length6  2.331405   0.246918   9.442  < 2e-16 ***
## terminal_streak_length7  2.587250   0.270716   9.557  < 2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Correlation of Fixed Effects:
##             (Intr) gnrtrb gnrtrs stcks0 stcks1 trm__2 trm__3 trm__4 trm__5
## generatrbng -0.522
## genertrstck -0.445  0.497
## stocks0     -0.625 -0.011 -0.100
## stocks1     -0.488  0.100 -0.023  0.479
## trmnl_str_2 -0.120 -0.001 -0.002  0.000 -0.001
## trmnl_str_3 -0.106 -0.008 -0.012  0.000 -0.009  0.074
## trmnl_str_4 -0.093 -0.009 -0.014  0.000 -0.010  0.066  0.065
## trmnl_str_5 -0.081 -0.009 -0.015  0.000 -0.011  0.058  0.058  0.054
## trmnl_str_6 -0.078 -0.009 -0.015  0.000 -0.011  0.056  0.056  0.052  0.046
## trmnl_str_7 -0.070 -0.009 -0.014  0.000 -0.011  0.051  0.052  0.047  0.043
##             trm__6
## generatrbng
## genertrstck
## stocks0
```

```
## stocks1
## trmnl_str_2
## trmnl_str_3
## trmnl_str_4
## trmnl_str_5
## trmnl_str_6
## trmnl_str_7  0.041
##    Group.1 Group.2 Group.3          V1
## 1  analyst      -1       1 -0.27963423
## 2    bingo      -1       1 -0.42310811
## 3    stock      -1       1 -0.50269233
## 4  analyst       0       1 -0.27758133
## 5    bingo       0       1 -0.42105521
## 6    stock       0       1 -0.50063943
## 7  analyst       1       1 -0.49150003
## 8    bingo       1       1 -0.63497391
## 9    stock       1       1 -0.71455813
## 10 analyst      -1       2 -0.06807072
## 11   bingo      -1       2 -0.21154461
## 12   stock      -1       2 -0.29112883
## 13 analyst       0       2 -0.06601782
## 14   bingo       0       2 -0.20949171
## 15   stock       0       2 -0.28907593
## 16 analyst       1       2 -0.27993652
## 17   bingo       1       2 -0.42341041
## 18   stock       1       2 -0.50299463
## 19 analyst      -1       3  1.04631307
## 20   bingo      -1       3  0.90283919
## 21   stock      -1       3  0.82325497
## 22 analyst       0       3  1.04836597
## 23   bingo       0       3  0.90489209
## 24   stock       0       3  0.82530787
## 25 analyst       1       3  0.83444727
## 26   bingo       1       3  0.69097339
## 27   stock       1       3  0.61138917
## 28 analyst      -1       4  1.51926472
## 29   bingo      -1       4  1.37579084
## 30   stock      -1       4  1.29620662
## 31 analyst       0       4  1.52131762
## 32   bingo       0       4  1.37784374
## 33   stock       0       4  1.29825952
## 34 analyst       1       4  1.30739892
## 35   bingo       1       4  1.16392504
## 36   stock       1       4  1.08434082
## 37 analyst      -1       5  1.94000033
## 38   bingo      -1       5  1.79652644
## 39   stock      -1       5  1.71694222
## 40 analyst       0       5  1.94205323
## 41   bingo       0       5  1.79857934
## 42   stock       0       5  1.71899512
## 43 analyst       1       5  1.72813453
## 44   bingo       1       5  1.58466064
## 45   stock       1       5  1.50507642
## 46 analyst      -1       6  2.05177085
```

```
## 47   bingo      -1       6  1.90829697
## 48   stock      -1       6  1.82871275
## 49 analyst       0       6  2.05382375
## 50   bingo       0       6  1.91034987
## 51   stock       0       6  1.83076565
## 52 analyst       1       6  1.83990506
## 53   bingo       1       6  1.69643117
## 54   stock       1       6  1.61684695
## 55 analyst      -1       7  2.30761627
## 56   bingo      -1       7  2.16414238
## 57   stock      -1       7  2.08455816
## 58 analyst       0       7  2.30966916
## 59   bingo       0       7  2.16619528
## 60   stock       0       7  2.08661106
## 61 analyst       1       7  2.09575047
## 62   bingo       1       7  1.95227658
## 63   stock       1       7  1.87269236
## [1] "Study 3B"
## # A tibble: 23 x 29
##    generator terminal_s~1 stocks study parti~2 rate  trial seque~3 type  predi~4
##    <fct>     <fct>        <fct>  <chr> <fct>   <chr> <dbl> <chr>   <chr>   <dbl>
##  1 analyst   2            0      3B    39      25-5~    14 010010~ targ~       1
##  2 analyst   2            0      3B    50      25-5~     8 101101~ targ~       0
##  3 analyst   2            0      3B    75      25-5~     5 101010~ targ~       1
##  4 analyst   2            0      3B    79      25-5~    15 010010~ targ~       1
##  5 analyst   2            0      3B    83      25-5~     7 101010~ targ~       1
##  6 analyst   2            0      3B    96      25-5~     4 101010~ targ~       1
##  7 analyst   2            0      3B    115     25-5~     4 101101~ targ~       0
##  8 analyst   2            0      3B    122     25-5~    10 010010~ targ~       1
##  9 analyst   2            0      3B    220     25-5~     7 101010~ targ~       1
## 10 analyst   2            0      3B    260     25-5~     9 010010~ targ~       1
## # ... with 13 more rows, 19 more variables: prediction_recode <dbl>,
## #   response_prob1 <chr>, score_prob1 <dbl>, response_prob2 <chr>,
## #   score_prob2 <dbl>, response_prob3 <chr>, score_prob3 <dbl>,
## #   response_fin1 <dbl>, score_fin1 <dbl>, response_fin2 <dbl>,
## #   score_fin2 <dbl>, age <dbl>, gender <fct>, highest_degree <dbl>,
## #   gambling <fct>, score_prob <dbl>, score_fin <dbl>, is.outlier <lgl>,
## #   is.extreme <lgl>, and abbreviated variable names ...
## # A tibble: 63 x 6
##    generator terminal_streak_length stocks variable          statistic        p
##    <fct>     <fct>                  <fct>  <chr>                 <dbl>    <dbl>
##  1 analyst   1                      -1     prediction_recode     0.622 8.78e-28
##  2 analyst   1                      0      prediction_recode     0.609 1.68e-35
##  3 analyst   1                      1      prediction_recode     0.609 2.12e-19
##  4 bingo     1                      -1     prediction_recode     0.613 1.09e-32
##  5 bingo     1                      0      prediction_recode     0.631 9.70e-33
##  6 bingo     1                      1      prediction_recode     0.625 4.64e-22
##  7 stock     1                      -1     prediction_recode     0.625 5.14e-26
##  8 stock     1                      0      prediction_recode     0.600 8.34e-36
##  9 stock     1                      1      prediction_recode     0.621 2.00e-18
## 10 analyst   2                      -1     prediction_recode     0.591 4.01e- 8
## # ... with 53 more rows
```




```
## # A tibble: 7 x 5
##   terminal_streak_length   df1   df2 statistic      p
##   <fct>                  <int> <int>     <dbl>  <dbl>
## 1 1                          8  3591     1.80  0.0724
## 2 2                          8   291     2.16  0.0302
## 3 3                          8   291     0.386 0.928
## 4 4                          8   291     0.457 0.885
## 5 5                          8   291     0.558 0.812
## 6 6                          8   291     0.249 0.981
## 7 7                          8   291     0.406 0.917
## $ANOVA
##                                    Effect DFn  DFd          F            p
## 2                               generator   2  291  0.5590484 5.723657e-01
## 3                                 stocks   2  291  0.4269790 6.528853e-01
## 5                  terminal_streak_length   6 1746 22.5936402 9.130586e-26
## 4                       generator:stocks   4  291  1.5726852 1.815819e-01
## 6        generator:terminal_streak_length  12 1746  1.5601822 9.665940e-02
## 7          stocks:terminal_streak_length  12 1746  0.4763853 9.293685e-01
## 8 generator:stocks:terminal_streak_length  24 1746  1.1052753 3.286546e-01
##   p<.05         ges
## 2       0.001577208
## 3       0.001205058
## 5     * 0.043721089
## 4       0.008809556
## 6       0.006274684
## 7       0.001924297
```

```
## 8       0.008867119
##
## $`Mauchly's Test for Sphericity`
##                                    Effect         W            p p<.05
## 5                  terminal_streak_length 0.6404353 6.919109e-18     *
## 6        generator:terminal_streak_length 0.6404353 6.919109e-18     *
## 7           stocks:terminal_streak_length 0.6404353 6.919109e-18     *
## 8 generator:stocks:terminal_streak_length 0.6404353 6.919109e-18     *
##
## $`Sphericity Corrections`
##                                    Effect      GGe        p[GG] p[GG]<.05
## 5                  terminal_streak_length 0.859868 1.677079e-22         *
## 6        generator:terminal_streak_length 0.859868 1.101134e-01
## 7           stocks:terminal_streak_length 0.859868 9.102933e-01
## 8 generator:stocks:terminal_streak_length 0.859868 3.352182e-01
##       HFe        p[HF] p[HF]<.05
## 5 0.87723 6.605682e-23         *
## 6 0.87723 1.083351e-01
## 7 0.87723 9.129471e-01
## 8 0.87723 3.343979e-01
##
## [1] "Games-Howell Test"
## # A tibble: 3 x 14
##   .y.     group1 group2    n1    n2 estim~1 conf.~2 conf.~3     se stati~4    df
## * <chr>   <chr>  <chr>  <int> <int>   <dbl>   <dbl>   <dbl>  <dbl>   <dbl> <dbl>
## 1 predic~ analy~ bingo   1764  1962  0.0275 -0.0105  0.0655 0.0115   1.70  3689.
## 2 predic~ analy~ stock   1764  1674  0.0148 -0.0246  0.0543 0.0119   0.882 3425.
## 3 predic~ bingo  stock   1962  1674 -0.0127 -0.0513  0.0260 0.0116   0.769 3548.
## # ... with 3 more variables: p.adj <dbl>, p.adj.signif <chr>, method <chr>, and
## #   abbreviated variable names 1: estimate, 2: conf.low, 3: conf.high,
## #   4: statistic
## # A tibble: 21 x 14
##    .y.   group1 group2    n1    n2 estim~1 conf.~2 conf.h~3     se stati~4    df
##  * <chr> <chr>  <chr>  <int> <int>   <dbl>   <dbl>    <dbl>  <dbl>   <dbl> <dbl>
##  1 pred~ 1      2       3600   300 -0.0892 -0.171  -0.00722 0.0195    3.23  358.
##  2 pred~ 1      3       3600   300  0.101   0.0118  0.190   0.0212    3.36  348.
##  3 pred~ 1      4       3600   300  0.154   0.0654  0.243   0.0212    5.15  348.
##  4 pred~ 1      5       3600   300  0.168   0.0789  0.256   0.0211    5.61  348.
##  5 pred~ 1      6       3600   300  0.161   0.0721  0.250   0.0212    5.38  348.
##  6 pred~ 1      7       3600   300  0.191   0.103   0.279   0.0210    6.42  349.
##  7 pred~ 2      3        300   300  0.19    0.0742  0.306   0.0277    4.85  593.
##  8 pred~ 2      4        300   300  0.243   0.128   0.359   0.0276    6.22  594.
##  9 pred~ 2      5        300   300  0.257   0.141   0.372   0.0276    6.57  594.
## 10 pred~ 2      6        300   300  0.25    0.134   0.366   0.0276    6.40  594.
## # ... with 11 more rows, 3 more variables: p.adj <dbl>, p.adj.signif <chr>,
## #   method <chr>, and abbreviated variable names 1: estimate, 2: conf.low,
## #   3: conf.high, 4: statistic
## # A tibble: 3 x 14
##   .y.     group1 group2    n1    n2 estim~1 conf.~2 conf.~3     se stati~4    df
## * <chr>   <chr>  <chr>  <int> <int>   <dbl>   <dbl>   <dbl>  <dbl>   <dbl> <dbl>
## 1 predic~ -1     0       1836  2736 0.00605 -0.0289  0.0410 0.0105   0.406 3940.
## 2 predic~ -1     1       1836   828 0.00935 -0.0392  0.0579 0.0146   0.452 1590.
## 3 predic~ 0      1       2736   828 0.00331 -0.0428  0.0494 0.0139   0.168 1364.
## # ... with 3 more variables: p.adj <dbl>, p.adj.signif <chr>, method <chr>, and
```

```
## #   abbreviated variable names 1: estimate, 2: conf.low, 3: conf.high,
## #   4: statistic
## [1] "Regression"
## Generalized linear mixed model fit by maximum likelihood (Laplace
##   Approximation) [glmerMod]
##  Family: binomial  ( logit )
## Formula: prediction_recode ~ generator + stocks + terminal_streak_length +
##     (1 | participant_id)
##    Data: df
##
##      AIC      BIC   logLik deviance df.resid
##   7184.4   7263.5  -3580.2   7160.4     5388
##
## Scaled residuals:
##     Min      1Q  Median      3Q     Max
## -1.5610 -0.8186 -0.6344  1.0373  1.9467
##
## Random effects:
##  Groups         Name        Variance Std.Dev.
##  participant_id (Intercept) 0.208    0.456
## Number of obs: 5400, groups:  participant_id, 300
##
## Fixed effects:
##                          Estimate Std. Error z value Pr(>|z|)
## (Intercept)              -0.57754    0.09083  -6.358 2.04e-10 ***
## generatorbingo            0.12451    0.09409   1.323 0.185743
## generatorstock            0.06109    0.09764   0.626 0.531508
## stocks0                   0.03635    0.08677   0.419 0.675298
## stocks1                   0.04117    0.11951   0.344 0.730487
## terminal_streak_length2 -0.41667    0.13367  -3.117 0.001827 **
## terminal_streak_length3  0.43222    0.12354   3.498 0.000468 ***
## terminal_streak_length4  0.65709    0.12394   5.302 1.15e-07 ***
## terminal_streak_length5  0.71383    0.12424   5.746 9.15e-09 ***
## terminal_streak_length6  0.68530    0.12408   5.523 3.33e-08 ***
## terminal_streak_length7  0.81347    0.12496   6.510 7.53e-11 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Correlation of Fixed Effects:
##             (Intr) gnrtrb gnrtrs stcks0 stcks1 trm__2 trm__3 trm__4 trm__5
## generatrbng -0.591
## genertrstck -0.509  0.503
## stocks0     -0.597  0.089 -0.025
## stocks1     -0.408  0.003 -0.009  0.430
## trmnl_str_2 -0.099 -0.001 -0.001  0.000  0.000
## trmnl_str_3 -0.112  0.002  0.001  0.001  0.000  0.074
## trmnl_str_4 -0.113  0.003  0.001  0.001  0.001  0.073  0.081
## trmnl_str_5 -0.113  0.003  0.001  0.001  0.001  0.073  0.081  0.082
## trmnl_str_6 -0.113  0.003  0.001  0.001  0.001  0.073  0.081  0.082  0.082
## trmnl_str_7 -0.113  0.004  0.001  0.001  0.001  0.072  0.081  0.081  0.081
##             trm__6
## generatrbng
## genertrstck
## stocks0
```

```
## stocks1
## trmnl_str_2
## trmnl_str_3
## trmnl_str_4
## trmnl_str_5
## trmnl_str_6
## trmnl_str_7  0.081
## optimizer (Nelder_Mead) convergence code: 0 (OK)
## Model failed to converge with max|grad| = 0.00211695 (tol = 0.002, component 1)
##
##    Group.1 Group.2 Group.3          V1
## 1  analyst      -1       1 -0.57754264
## 2    bingo      -1       1 -0.45303543
## 3    stock      -1       1 -0.51644821
## 4  analyst       0       1 -0.54119546
## 5    bingo       0       1 -0.41668825
## 6    stock       0       1 -0.48010102
## 7  analyst       1       1 -0.53637338
## 8    bingo       1       1 -0.41186617
## 9    stock       1       1 -0.47527895
## 10 analyst      -1       2 -0.99420899
## 11   bingo      -1       2 -0.86970179
## 12   stock      -1       2 -0.93311456
## 13 analyst       0       2 -0.95786181
## 14   bingo       0       2 -0.83335460
## 15   stock       0       2 -0.89676738
## 16 analyst       1       2 -0.95303973
## 17   bingo       1       2 -0.82853253
## 18   stock       1       2 -0.89194530
## 19 analyst      -1       3 -0.14532737
## 20   bingo      -1       3 -0.02082016
## 21   stock      -1       3 -0.08423294
## 22 analyst       0       3 -0.10898018
## 23   bingo       0       3  0.01552702
## 24   stock       0       3 -0.04788575
## 25 analyst       1       3 -0.10415811
## 26   bingo       1       3  0.02034910
## 27   stock       1       3 -0.04306368
## 28 analyst      -1       4  0.07954920
## 29   bingo      -1       4  0.20405641
## 30   stock      -1       4  0.14064363
## 31 analyst       0       4  0.11589638
## 32   bingo       0       4  0.24040359
## 33   stock       0       4  0.17699082
## 34 analyst       1       4  0.12071846
## 35   bingo       1       4  0.24522567
## 36   stock       1       4  0.18181289
## 37 analyst      -1       5  0.13628762
## 38   bingo      -1       5  0.26079483
## 39   stock      -1       5  0.19738205
## 40 analyst       0       5  0.17263481
## 41   bingo       0       5  0.29714201
## 42   stock       0       5  0.23372924
## 43 analyst       1       5  0.17745688
```

```
## 44   bingo       1       5  0.30196409
## 45   stock       1       5  0.23855131
## 46 analyst      -1       6  0.10775550
## 47   bingo      -1       6  0.23226271
## 48   stock      -1       6  0.16884993
## 49 analyst       0       6  0.14410268
## 50   bingo       0       6  0.26860989
## 51   stock       0       6  0.20519712
## 52 analyst       1       6  0.14892476
## 53   bingo       1       6  0.27343197
## 54   stock       1       6  0.21001919
## 55 analyst      -1       7  0.23593081
## 56   bingo      -1       7  0.36043802
## 57   stock      -1       7  0.29702524
## 58 analyst       0       7  0.27227800
## 59   bingo       0       7  0.39678520
## 60   stock       0       7  0.33337243
## 61 analyst       1       7  0.27710007
## 62   bingo       1       7  0.40160728
## 63   stock       1       7  0.33819450
```