Narrative mixed models

2023-01-05

```
load("1213session")
#write.csv(all_d, "./results_combined.csv")
```

```
## Loading required package: dplyr
```

```
##
## 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
```

```
## This is VWPre version 1.2.4. See NEWS for important changes.
## For package information, type 'help(package="VWPre")'.
## To cite this package, type 'citation(package="VWPre")'.
```

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

```
##
## Attaching package: 'lmerTest'
```

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

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

```
## New names:
## Rows: 7265 Columns: 45
## -- Column specification
## -------------------------------------------------------- Delimiter: "," chr
## (3): RECORDING_SESSION_LABEL, story, 0 dbl (42): ...1, Unnamed: 0.1, category,
## proportion_x, IA_DWELL_TIME, IA_REGR...
## i Use `spec()` to retrieve the full column specification for this data. i
## Specify the column types or set `show_col_types = FALSE` to quiet this message.
## * `` -> `...1`
```

```
model_binary = lmer(highlight ~ 1 + word_norm + sadness + joy + concreteness + neutral + anger + neutral
```

```
## Warning: Some predictor variables are on very different scales: consider
## rescaling
```

```
## Warning: Some predictor variables are on very different scales: consider
## rescaling
```

```
model = lmer(proportion_x ~ 1 + word_norm +  positive + negative + concreteness + valence_avg_x + norm_
```

```
## Warning: Some predictor variables are on very different scales: consider
## rescaling
```

```
## Warning: Some predictor variables are on very different scales: consider
## rescaling
```

```
model_gaze = lmer(norm_dt ~ 1 + word_norm +  positive + negative + concreteness + valence_avg_x + arousa
```

Predict binary highlight annotation

```
summary(model_binary)
```

```
## Linear mixed model fit by REML. t-tests use Satterthwaite's method [
## lmerModLmerTest]
## Formula: highlight ~ 1 + word_norm + sadness + joy + concreteness + neutral +
##     anger + neutral.1 + norm_dt + norm_reg_path + IA_AVERAGE_FIX_PUPIL_SIZE_SMOOTHED +
##     (1 | RECORDING_SESSION_LABEL) + (1 | story)
##    Data: all_data_continuous
##
## REML criterion at convergence: 8147.4
##
## Scaled residuals:
##     Min      1Q  Median      3Q     Max
## -2.6570 -0.7473 -0.2976  0.9087  2.5555
##
## Random effects:
##  Groups                   Name        Variance Std.Dev.
##  RECORDING_SESSION_LABEL (Intercept) 0.037620 0.19396
##  story                    (Intercept) 0.001629 0.04036
##  Residual                             0.177642 0.42148
## Number of obs: 7168, groups:  RECORDING_SESSION_LABEL, 23; story, 2
##
## Fixed effects:
##                                      Estimate Std. Error         df t value
## (Intercept)                          3.925e-01  6.786e-02  2.520e+01   5.784
## word_norm                            6.190e-01  3.011e-02  7.135e+03  20.557
## sadness                             -1.162e-02  3.146e-02  7.134e+03  -0.369
## joy                                 -6.935e-02  2.835e-02  7.135e+03  -2.446
## concreteness                         3.226e-03  1.418e-02  7.128e+03   0.227
## neutral                             -8.630e-02  1.903e-02  7.134e+03  -4.535
## anger                               -6.037e-02  2.707e-02  7.135e+03  -2.231
## neutral.1                           -1.002e-01  2.339e-02  7.135e+03  -4.283
## norm_dt                             -3.481e-05  2.053e-05  7.148e+03  -1.696
## norm_reg_path                        2.969e-06  7.563e-06  7.138e+03   0.393
## IA_AVERAGE_FIX_PUPIL_SIZE_SMOOTHED -2.511e-04  1.233e-04  4.590e+03  -2.036
##                                     Pr(>|t|)
## (Intercept)                         4.83e-06 ***
## word_norm                            < 2e-16 ***
## sadness                               0.7119
## joy                                   0.0145 *
## concreteness                          0.8201
## neutral                             5.86e-06 ***
```

```
## anger                                0.0257 *
## neutral.1                          1.87e-05 ***
## norm_dt                              0.0900 .
## norm_reg_path                        0.6946
## IA_AVERAGE_FIX_PUPIL_SIZE_SMOOTHED   0.0418 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Correlation of Fixed Effects:
##             (Intr) wrd_nr sadnss joy    cncrtn neutrl anger  ntrl.1 nrm_dt
## word_norm   -0.208
## sadness     -0.039 -0.161
## joy         -0.082 -0.011  0.197
## concretenss -0.517  0.157 -0.083 -0.060
## neutral     -0.090  0.155  0.113  0.035  0.066
## anger       -0.059  0.076  0.192  0.230 -0.102  0.277
## neutral.1   -0.048 -0.007  0.205  0.363 -0.245 -0.311  0.120
## norm_dt     -0.050  0.112 -0.005 -0.106 -0.013 -0.009 -0.004  0.010
## norm_rg_pth -0.005  0.010  0.004  0.012 -0.011  0.019  0.013  0.016 -0.562
## IA_AVERAGE_ -0.355  0.046  0.008  0.010 -0.010  0.011  0.016 -0.020  0.004
##             nrm_r_
## word_norm
## sadness
## joy
## concretenss
## neutral
## anger
## neutral.1
## norm_dt
## norm_rg_pth
## IA_AVERAGE_  0.003
## fit warnings:
## Some predictor variables are on very different scales: consider rescaling
```

variance explained by fixed variables and by both fixed and random variables

```
r.squaredGLMM(model_binary)
```

```
## Warning: 'r.squaredGLMM' now calculates a revised statistic. See the help page.
```

```
##           R2m       R2c
## [1,] 0.068474 0.2370461
```

```
coef(model_binary)
```

```
## $RECORDING_SESSION_LABEL
##      (Intercept) word_norm     sadness         joy concreteness     neutral
## id10   0.2380489  0.618961 -0.01161935 -0.06935174  0.003226491 -0.08630183
## id11   0.4274233  0.618961 -0.01161935 -0.06935174  0.003226491 -0.08630183
## id12   0.2535365  0.618961 -0.01161935 -0.06935174  0.003226491 -0.08630183
## id13   0.4930050  0.618961 -0.01161935 -0.06935174  0.003226491 -0.08630183
## id14   0.9166992  0.618961 -0.01161935 -0.06935174  0.003226491 -0.08630183
## id15   0.1697516  0.618961 -0.01161935 -0.06935174  0.003226491 -0.08630183
## id17   0.2836732  0.618961 -0.01161935 -0.06935174  0.003226491 -0.08630183
## id18   0.1643167  0.618961 -0.01161935 -0.06935174  0.003226491 -0.08630183
## id19   0.3418959  0.618961 -0.01161935 -0.06935174  0.003226491 -0.08630183
```

```
## id2    0.7649482  0.618961 -0.01161935 -0.06935174  0.003226491 -0.08630183
## id20   0.4815764  0.618961 -0.01161935 -0.06935174  0.003226491 -0.08630183
## id21   0.3995169  0.618961 -0.01161935 -0.06935174  0.003226491 -0.08630183
## id22   0.2512531  0.618961 -0.01161935 -0.06935174  0.003226491 -0.08630183
## id23   0.6079817  0.618961 -0.01161935 -0.06935174  0.003226491 -0.08630183
## id24   0.5552408  0.618961 -0.01161935 -0.06935174  0.003226491 -0.08630183
## id25   0.1444041  0.618961 -0.01161935 -0.06935174  0.003226491 -0.08630183
## id27   0.3035227  0.618961 -0.01161935 -0.06935174  0.003226491 -0.08630183
## id28   0.2392285  0.618961 -0.01161935 -0.06935174  0.003226491 -0.08630183
## id3    0.5351728  0.618961 -0.01161935 -0.06935174  0.003226491 -0.08630183
## id30   0.4010237  0.618961 -0.01161935 -0.06935174  0.003226491 -0.08630183
## id5    0.3604268  0.618961 -0.01161935 -0.06935174  0.003226491 -0.08630183
## id7    0.2764052  0.618961 -0.01161935 -0.06935174  0.003226491 -0.08630183
## id8    0.4181014  0.618961 -0.01161935 -0.06935174  0.003226491 -0.08630183
##            anger  neutral.1       norm_dt norm_reg_path
## id10 -0.06037434 -0.1001593 -3.481138e-05  2.968828e-06
## id11 -0.06037434 -0.1001593 -3.481138e-05  2.968828e-06
## id12 -0.06037434 -0.1001593 -3.481138e-05  2.968828e-06
## id13 -0.06037434 -0.1001593 -3.481138e-05  2.968828e-06
## id14 -0.06037434 -0.1001593 -3.481138e-05  2.968828e-06
## id15 -0.06037434 -0.1001593 -3.481138e-05  2.968828e-06
## id17 -0.06037434 -0.1001593 -3.481138e-05  2.968828e-06
## id18 -0.06037434 -0.1001593 -3.481138e-05  2.968828e-06
## id19 -0.06037434 -0.1001593 -3.481138e-05  2.968828e-06
## id2  -0.06037434 -0.1001593 -3.481138e-05  2.968828e-06
## id20 -0.06037434 -0.1001593 -3.481138e-05  2.968828e-06
## id21 -0.06037434 -0.1001593 -3.481138e-05  2.968828e-06
## id22 -0.06037434 -0.1001593 -3.481138e-05  2.968828e-06
## id23 -0.06037434 -0.1001593 -3.481138e-05  2.968828e-06
## id24 -0.06037434 -0.1001593 -3.481138e-05  2.968828e-06
## id25 -0.06037434 -0.1001593 -3.481138e-05  2.968828e-06
## id27 -0.06037434 -0.1001593 -3.481138e-05  2.968828e-06
## id28 -0.06037434 -0.1001593 -3.481138e-05  2.968828e-06
## id3  -0.06037434 -0.1001593 -3.481138e-05  2.968828e-06
## id30 -0.06037434 -0.1001593 -3.481138e-05  2.968828e-06
## id5  -0.06037434 -0.1001593 -3.481138e-05  2.968828e-06
## id7  -0.06037434 -0.1001593 -3.481138e-05  2.968828e-06
## id8  -0.06037434 -0.1001593 -3.481138e-05  2.968828e-06
##      IA_AVERAGE_FIX_PUPIL_SIZE_SMOOTHED
## id10                       -0.0002511271
## id11                       -0.0002511271
## id12                       -0.0002511271
## id13                       -0.0002511271
## id14                       -0.0002511271
## id15                       -0.0002511271
## id17                       -0.0002511271
## id18                       -0.0002511271
## id19                       -0.0002511271
## id2                        -0.0002511271
## id20                       -0.0002511271
## id21                       -0.0002511271
## id22                       -0.0002511271
## id23                       -0.0002511271
## id24                       -0.0002511271
```

```
## id25                      -0.0002511271
## id27                      -0.0002511271
## id28                      -0.0002511271
## id3                       -0.0002511271
## id30                      -0.0002511271
## id5                       -0.0002511271
## id7                       -0.0002511271
## id8                       -0.0002511271
##
## $story
##    (Intercept) word_norm     sadness         joy concreteness     neutral
## EL   0.4205191  0.618961 -0.01161935 -0.06935174  0.003226491 -0.08630183
## SM   0.3644507  0.618961 -0.01161935 -0.06935174  0.003226491 -0.08630183
##          anger  neutral.1       norm_dt norm_reg_path
## EL -0.06037434 -0.1001593 -3.481138e-05  2.968828e-06
## SM -0.06037434 -0.1001593 -3.481138e-05  2.968828e-06
##    IA_AVERAGE_FIX_PUPIL_SIZE_SMOOTHED
## EL                      -0.0002511271
## SM                      -0.0002511271
##
## attr(,"class")
## [1] "coef.mer"
```

Predict continuous highlight annotation

i.e. what proportion of the sentence is highlighted

```
summary(model)
```

```
## Linear mixed model fit by REML. t-tests use Satterthwaite's method [
## lmerModLmerTest]
## Formula: proportion_x ~ 1 + word_norm + positive + negative + concreteness +
##     valence_avg_x + norm_dt + arousal_avg_x + (1 | RECORDING_SESSION_LABEL) +
##     (1 | story)
##    Data: all_data_continuous
##
## REML criterion at convergence: 5985
##
## Scaled residuals:
##     Min      1Q  Median      3Q     Max
## -2.5728 -0.6438 -0.3283  0.6073  2.8265
##
## Random effects:
##  Groups                   Name        Variance  Std.Dev.
##  RECORDING_SESSION_LABEL (Intercept) 0.0336130 0.18334
##  story                    (Intercept) 0.0005216 0.02284
##  Residual                             0.1340357 0.36611
## Number of obs: 7042, groups:  RECORDING_SESSION_LABEL, 23; story, 2
##
## Fixed effects:
##                 Estimate Std. Error         df t value Pr(>|t|)
## (Intercept)    7.670e-02  6.900e-02  1.249e+02   1.112  0.26841
## word_norm      3.414e-01  2.589e-02  6.992e+03  13.188  < 2e-16 ***
## positive       5.878e-02  2.246e-02  7.012e+03   2.616  0.00891 **
## negative       1.393e-01  1.961e-02  7.006e+03   7.101 1.36e-12 ***
```

```
## concreteness   5.723e-03  1.327e-02  6.967e+03   0.431  0.66639
## valence_avg_x  8.620e-02  4.487e-02  7.011e+03   1.921  0.05474 .
## norm_dt       -3.920e-05  1.646e-05  7.030e+03  -2.381  0.01727 *
## arousal_avg_x  4.940e-02  5.361e-02  7.012e+03   0.921  0.35682
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Correlation of Fixed Effects:
##             (Intr) wrd_nr positv negatv cncrtn vlnc__ nrm_dt
## word_norm   -0.185
## positive     0.020 -0.029
## negative    -0.240 -0.095  0.434
## concretenss -0.589  0.189  0.096  0.260
## valenc_vg_x -0.491  0.000 -0.303  0.176  0.132
## norm_dt     -0.014  0.129 -0.106 -0.038  0.022 -0.083
## arousl_vg_x -0.309  0.043 -0.094 -0.175 -0.070  0.096 -0.060
## fit warnings:
## Some predictor variables are on very different scales: consider rescaling
```

```
print('variance explained by fixed variables and by both fixed and random variables')
```

```
## [1] "variance explained by fixed variables and by both fixed and random variables"
```

```
r.squaredGLMM(model)
```

```
##             R2m      R2c
## [1,] 0.03144235 0.228037
```

```
coef(model)
```

```
## $RECORDING_SESSION_LABEL
##       (Intercept) word_norm   positive  negative concreteness valence_avg_x
## id10 -0.036081033 0.3414333 0.05877647 0.1392896  0.005722752    0.08620256
## id11  0.008432203 0.3414333 0.05877647 0.1392896  0.005722752    0.08620256
## id12 -0.043714224 0.3414333 0.05877647 0.1392896  0.005722752    0.08620256
## id13  0.069414093 0.3414333 0.05877647 0.1392896  0.005722752    0.08620256
## id14  0.588941724 0.3414333 0.05877647 0.1392896  0.005722752    0.08620256
## id15 -0.080605654 0.3414333 0.05877647 0.1392896  0.005722752    0.08620256
## id17 -0.025229886 0.3414333 0.05877647 0.1392896  0.005722752    0.08620256
## id18 -0.124235012 0.3414333 0.05877647 0.1392896  0.005722752    0.08620256
## id19  0.099914311 0.3414333 0.05877647 0.1392896  0.005722752    0.08620256
## id2   0.462710338 0.3414333 0.05877647 0.1392896  0.005722752    0.08620256
## id20  0.112245629 0.3414333 0.05877647 0.1392896  0.005722752    0.08620256
## id21  0.103034333 0.3414333 0.05877647 0.1392896  0.005722752    0.08620256
## id22 -0.097116335 0.3414333 0.05877647 0.1392896  0.005722752    0.08620256
## id23  0.333151872 0.3414333 0.05877647 0.1392896  0.005722752    0.08620256
## id24  0.216649801 0.3414333 0.05877647 0.1392896  0.005722752    0.08620256
## id25 -0.126924090 0.3414333 0.05877647 0.1392896  0.005722752    0.08620256
## id27 -0.021314144 0.3414333 0.05877647 0.1392896  0.005722752    0.08620256
## id28 -0.045387416 0.3414333 0.05877647 0.1392896  0.005722752    0.08620256
## id3   0.204135515 0.3414333 0.05877647 0.1392896  0.005722752    0.08620256
## id30  0.071879530 0.3414333 0.05877647 0.1392896  0.005722752    0.08620256
## id5   0.060094797 0.3414333 0.05877647 0.1392896  0.005722752    0.08620256
## id7  -0.023622399 0.3414333 0.05877647 0.1392896  0.005722752    0.08620256
## id8   0.057763292 0.3414333 0.05877647 0.1392896  0.005722752    0.08620256
##            norm_dt arousal_avg_x
```

```
## id10 -3.920443e-05    0.04940479
## id11 -3.920443e-05    0.04940479
## id12 -3.920443e-05    0.04940479
## id13 -3.920443e-05    0.04940479
## id14 -3.920443e-05    0.04940479
## id15 -3.920443e-05    0.04940479
## id17 -3.920443e-05    0.04940479
## id18 -3.920443e-05    0.04940479
## id19 -3.920443e-05    0.04940479
## id2  -3.920443e-05    0.04940479
## id20 -3.920443e-05    0.04940479
## id21 -3.920443e-05    0.04940479
## id22 -3.920443e-05    0.04940479
## id23 -3.920443e-05    0.04940479
## id24 -3.920443e-05    0.04940479
## id25 -3.920443e-05    0.04940479
## id27 -3.920443e-05    0.04940479
## id28 -3.920443e-05    0.04940479
## id3  -3.920443e-05    0.04940479
## id30 -3.920443e-05    0.04940479
## id5  -3.920443e-05    0.04940479
## id7  -3.920443e-05    0.04940479
## id8  -3.920443e-05    0.04940479
##
## $story
##    (Intercept) word_norm   positive  negative concreteness valence_avg_x
## EL  0.06119435 0.3414333 0.05877647 0.1392896  0.005722752    0.08620256
## SM  0.09220888 0.3414333 0.05877647 0.1392896  0.005722752    0.08620256
##          norm_dt arousal_avg_x
## EL -3.920443e-05    0.04940479
## SM -3.920443e-05    0.04940479
##
## attr(,"class")
## [1] "coef.mer"
```

Predict dwell time

```
summary(model_gaze)
```

```
## Linear mixed model fit by REML. t-tests use Satterthwaite's method [
## lmerModLmerTest]
## Formula: norm_dt ~ 1 + word_norm + positive + negative + concreteness +
##     valence_avg_x + arousal_avg_x + proportion_x + (1 | RECORDING_SESSION_LABEL) +
##     (1 | story)
##    Data: all_data_continuous
##
## REML criterion at convergence: 98603
##
## Scaled residuals:
##     Min      1Q  Median      3Q     Max
## -2.2753 -0.3380 -0.0904  0.1564 27.3061
##
## Random effects:
##  Groups                 Name        Variance Std.Dev.
```

```
##  RECORDING_SESSION_LABEL (Intercept)  9829.0   99.14
##  story                   (Intercept)   264.7   16.27
##  Residual                             70348.5  265.23
## Number of obs: 7042, groups:  RECORDING_SESSION_LABEL, 23; story, 2
##
## Fixed effects:
##               Estimate Std. Error       df t value Pr(>|t|)
## (Intercept)     60.994     46.414  155.915   1.314  0.19073
## word_norm     -195.180     18.843 6990.412 -10.358  < 2e-16 ***
## positive       146.135     16.189 7011.836   9.027  < 2e-16 ***
## negative        48.267     14.249 7007.994   3.387  0.00071 ***
## concreteness   -17.538      9.614 6962.194  -1.824  0.06818 .
## valence_avg_x  228.371     32.400 7011.181   7.049 1.98e-12 ***
## arousal_avg_x  195.653     38.773 7010.965   5.046 4.62e-07 ***
## proportion_x   -20.428      8.624 7021.079  -2.369  0.01788 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Correlation of Fixed Effects:
##             (Intr) wrd_nr positv negatv cncrtn vlnc__ arsl__
## word_norm   -0.194
## positive     0.020 -0.011
## negative    -0.257 -0.076  0.433
## concretenss -0.634  0.186  0.099  0.261
## valenc_vg_x -0.532  0.014 -0.314  0.175  0.135
## arousl_vg_x -0.334  0.052 -0.100 -0.176 -0.069  0.092
## proportin_x -0.014 -0.160 -0.028 -0.083 -0.006 -0.021 -0.009
```

```
print('variance explained by fixed variables and by both fixed and random variables')
```

```
## [1] "variance explained by fixed variables and by both fixed and random variables"
```

```
r.squaredGLMM(model_gaze)
```

```
##             R2m       R2c
## [1,] 0.04415542 0.1640933
```

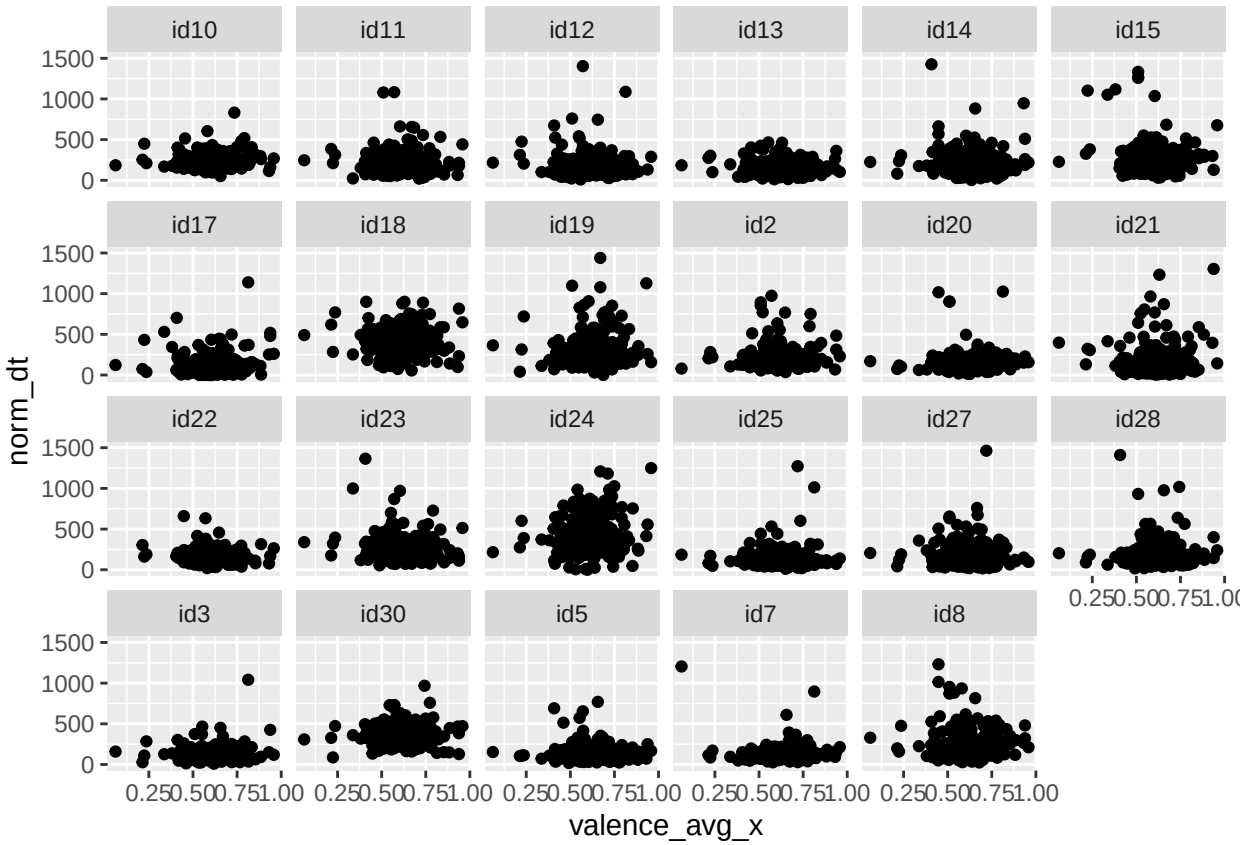
```
coef(model_gaze)
```

```
## $RECORDING_SESSION_LABEL
##      (Intercept) word_norm positive negative concreteness valence_avg_x
## id10  101.591316   -195.18 146.1348 48.26696    -17.53768      228.3714
## id11   64.254139   -195.18 146.1348 48.26696    -17.53768      228.3714
## id12   10.934272   -195.18 146.1348 48.26696    -17.53768      228.3714
## id13  -12.171140   -195.18 146.1348 48.26696    -17.53768      228.3714
## id14   51.248052   -195.18 146.1348 48.26696    -17.53768      228.3714
## id15  102.108117   -195.18 146.1348 48.26696    -17.53768      228.3714
## id17  -53.552223   -195.18 146.1348 48.26696    -17.53768      228.3714
## id18  256.365318   -195.18 146.1348 48.26696    -17.53768      228.3714
## id19  143.526918   -195.18 146.1348 48.26696    -17.53768      228.3714
## id2    61.137934   -195.18 146.1348 48.26696    -17.53768      228.3714
## id20    2.552317   -195.18 146.1348 48.26696    -17.53768      228.3714
## id21    6.797002   -195.18 146.1348 48.26696    -17.53768      228.3714
## id22    9.041483   -195.18 146.1348 48.26696    -17.53768      228.3714
## id23  115.725474   -195.18 146.1348 48.26696    -17.53768      228.3714
## id24  320.405411   -195.18 146.1348 48.26696    -17.53768      228.3714
```

```
## id25  -23.578849   -195.18 146.1348 48.26696    -17.53768      228.3714
## id27    2.360360   -195.18 146.1348 48.26696    -17.53768      228.3714
## id28   32.495156   -195.18 146.1348 48.26696    -17.53768      228.3714
## id3   -32.845718   -195.18 146.1348 48.26696    -17.53768      228.3714
## id30  216.381295   -195.18 146.1348 48.26696    -17.53768      228.3714
## id5   -26.627891   -195.18 146.1348 48.26696    -17.53768      228.3714
## id7   -36.524091   -195.18 146.1348 48.26696    -17.53768      228.3714
## id8    91.239635   -195.18 146.1348 48.26696    -17.53768      228.3714
##      arousal_avg_x proportion_x
## id10      195.6529    -20.42845
## id11      195.6529    -20.42845
## id12      195.6529    -20.42845
## id13      195.6529    -20.42845
## id14      195.6529    -20.42845
## id15      195.6529    -20.42845
## id17      195.6529    -20.42845
## id18      195.6529    -20.42845
## id19      195.6529    -20.42845
## id2       195.6529    -20.42845
## id20      195.6529    -20.42845
## id21      195.6529    -20.42845
## id22      195.6529    -20.42845
## id23      195.6529    -20.42845
## id24      195.6529    -20.42845
## id25      195.6529    -20.42845
## id27      195.6529    -20.42845
## id28      195.6529    -20.42845
## id3       195.6529    -20.42845
## id30      195.6529    -20.42845
## id5       195.6529    -20.42845
## id7       195.6529    -20.42845
## id8       195.6529    -20.42845
##
## $story
##    (Intercept) word_norm positive negative concreteness valence_avg_x
## EL    72.02668   -195.18 146.1348 48.26696    -17.53768      228.3714
## SM    49.96151   -195.18 146.1348 48.26696    -17.53768      228.3714
##    arousal_avg_x proportion_x
## EL      195.6529    -20.42845
## SM      195.6529    -20.42845
##
## attr(,"class")
## [1] "coef.mer"
```

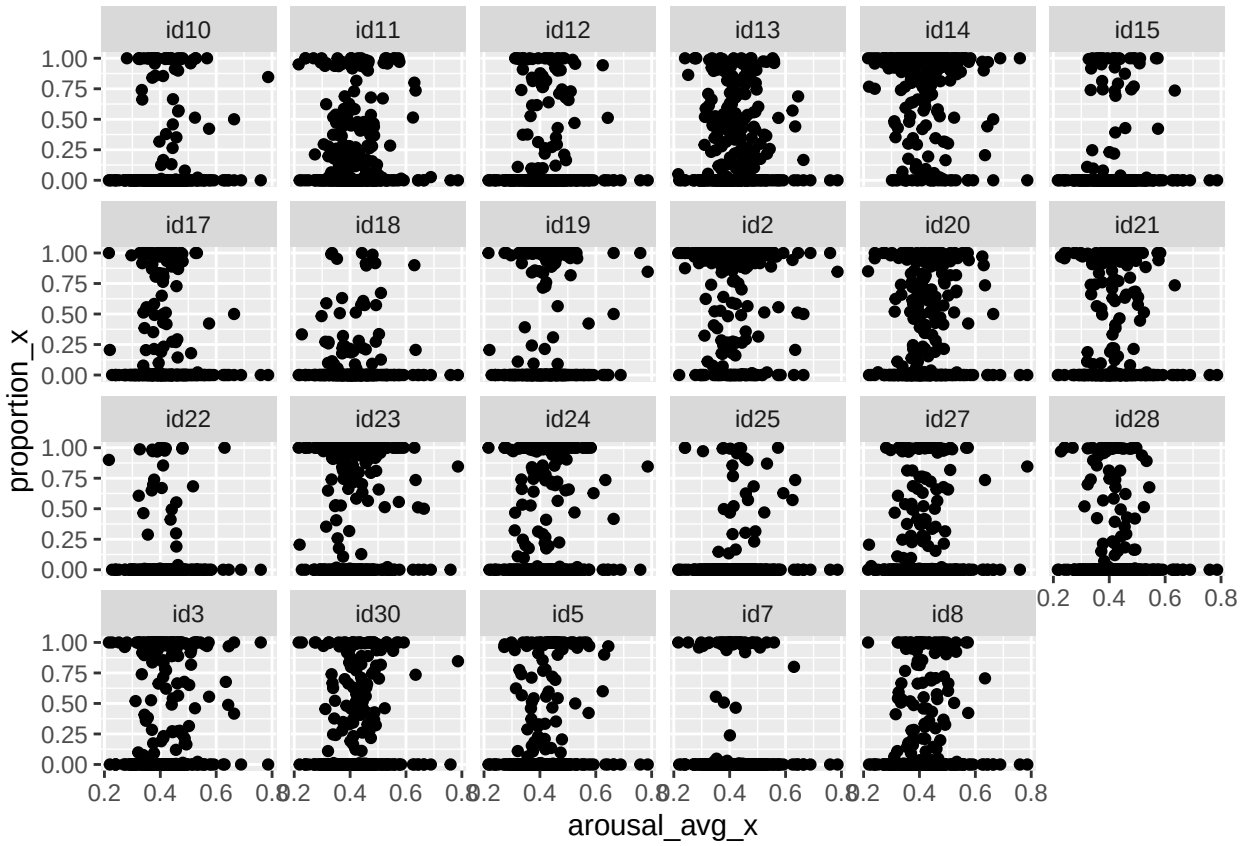
```
library(ggplot2)
#ggplot(all_data_continuous ,aes(x=norm_dt_scaled,y=proportion, colour=RECORDING_SESSION_LABEL)) + geom
ggplot(all_data_continuous ,aes(x=valence_avg_x, y=norm_dt))+ geom_point() + ylim(0, 1500)  + facet_wra
```

```
## Warning: Removed 257 rows containing missing values (`geom_point()`).
```




```
ggplot(all_data_continuous ,aes(x=arousal_avg_x, y=proportion_x)) + geom_point() + facet_wrap(~RECORDIN
```

```
## Warning: Removed 201 rows containing missing values (`geom_point()`).
```




```
#filtered_df <- subset(all_data_continuous, all_data_continuous$category > 0)
boxplot(negative ~ highlight,
col=c("white","lightgray"), all_data_continuous)
```