

ROI_analysis

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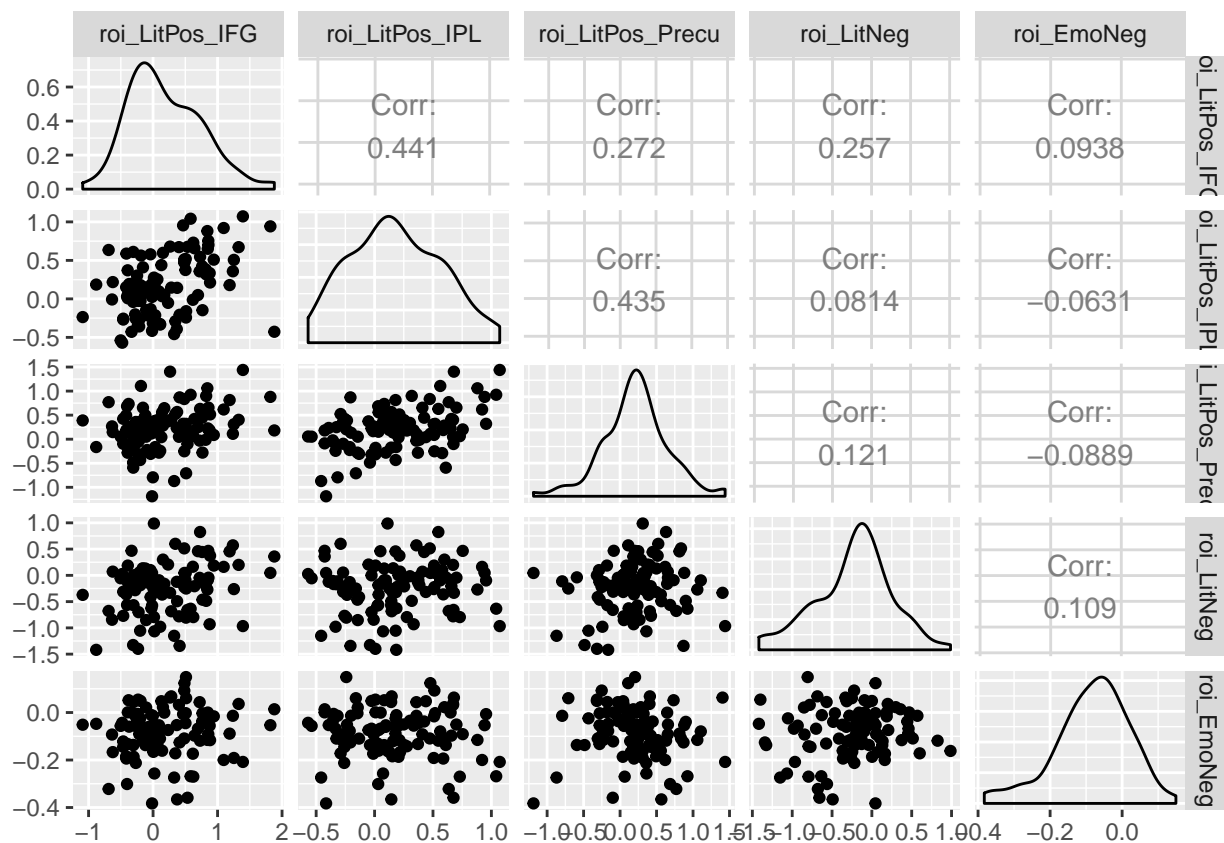
```
library(readxl)
ROI_analysis <- read_excel("~/Desktop/ROI_analysis.xlsx")
library(lme4)

## Loading required package: Matrix

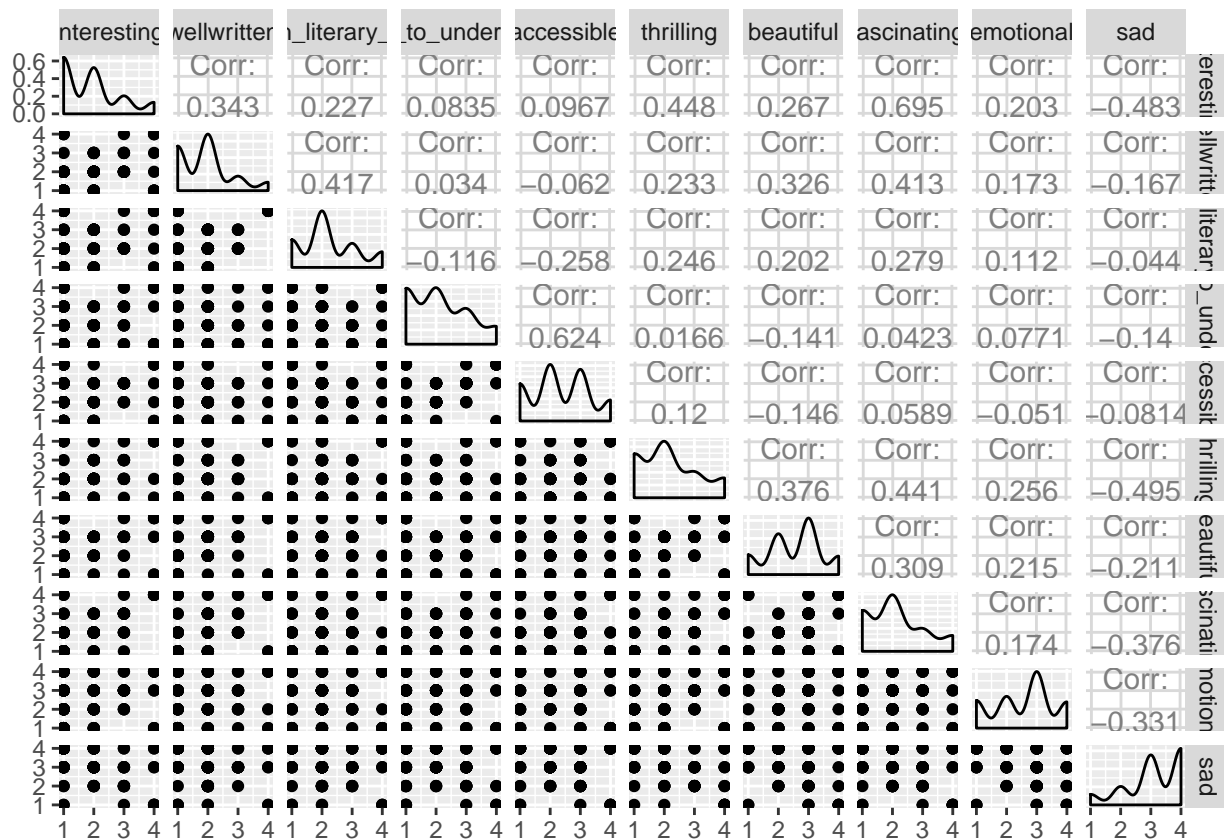
library(ggplot2)
library(GGally)

## Registered S3 method overwritten by 'GGally':
##   method from
##   +.gg      ggplot2

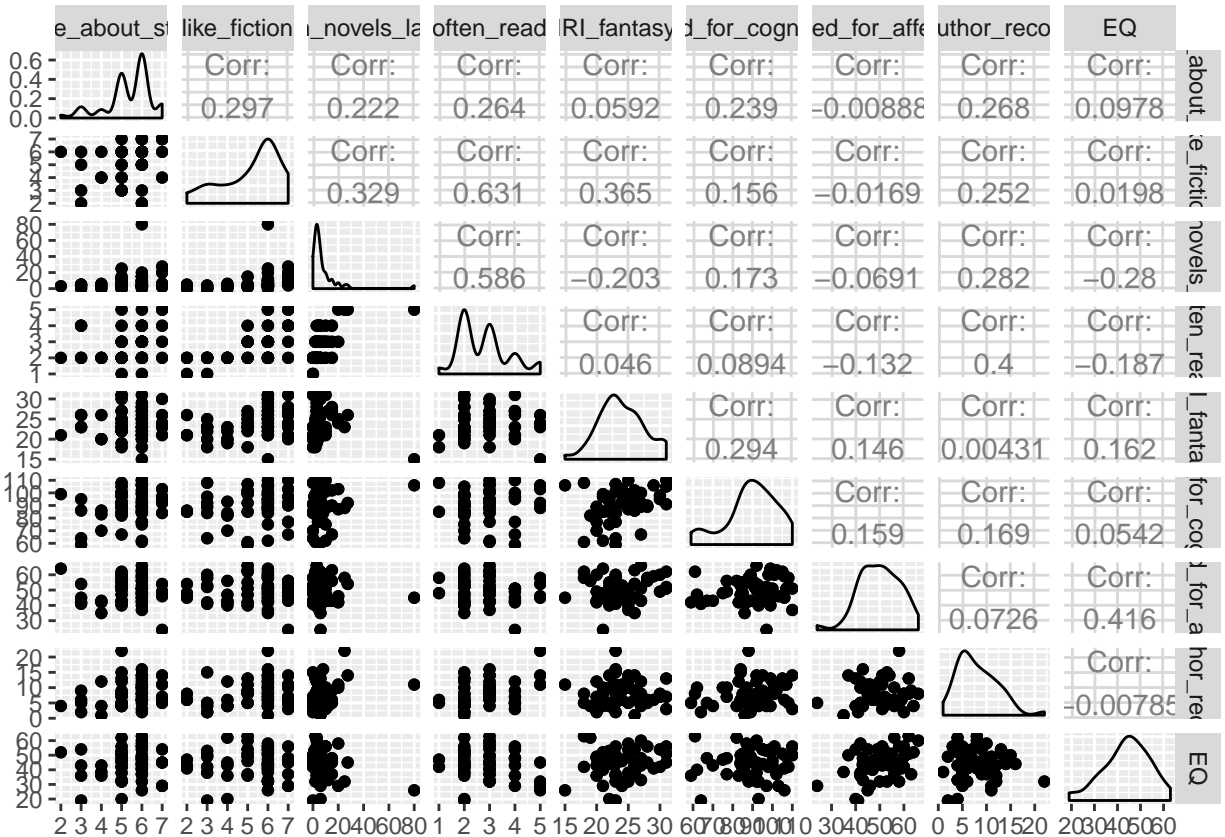
#exploratory data analysis
ggpairs(data = ROI_analysis[, c("roi_LitPos_IFG", "roi_LitPos_IPL", "roi_LitPos_Precu",
                                "roi_LitNeg" , "roi_EmoNeg")])
```



```
ggpairs(data = ROI_analysis[, c("interesting", "wellwritten", "of_high_literary_quality",
                                "easy_to_understand", "accessible", "thrilling", "beautiful",
                                "fascinating", "emotional", "sad")])
```



```
ggpairs(data = ROI_analysis[, c("care_about_style", "like_fiction", "num_novels_lastyr",
                                "often_read", "IRI_fantasy", "need_for_cognition",
                                "need_for_affect", "author_recog", "EQ")])
```



#ROI predicted by per story 10 item ratings

```
lmIFG_10item <- lmer(roi_LitPos_IFG ~ interesting + wellwritten + of_high_literary_quality +
  easy_to_understand + accessible + thrilling + beautiful + fascinating +
  emotional + sad + (1|Story) + (1|fMRI_subj), data = ROI_analysis)
```

boundary (singular) fit: see ?isSingular

```
summary(lmIFG_10item)
```

Linear mixed model fit by REML ['lmerMod']

Formula:

```
## roi_LitPos_IFG ~ interesting + wellwritten + of_high_literary_quality +
##   easy_to_understand + accessible + thrilling + beautiful +
##   fascinating + emotional + sad + (1 | Story) + (1 | fMRI_subj)
```

Data: ROI_analysis

##

REML criterion at convergence: 203.8

##

Scaled residuals:

```
##      Min       1Q   Median       3Q      Max
## -2.2050 -0.5789 -0.1656  0.6454  3.3078
```

##

Random effects:

```

## Groups      Name          Variance Std.Dev.
## fMRI_subj (Intercept) 0.00000 0.0000
## Story      (Intercept) 0.02734 0.1653
## Residual                0.31654 0.5626
## Number of obs: 103, groups: fMRI_subj, 52; Story, 2
##
## Fixed effects:
##
##              Estimate Std. Error t value
## (Intercept)    0.0003541 0.4756347 0.001
## interesting     0.1121551 0.0875589 1.281
## wellwritten    -0.1027217 0.0785008 -1.309
## of_high_literary_quality 0.0065737 0.0706166 0.093
## easy_to_understand 0.1487427 0.0759452 1.959
## accessible    -0.1228659 0.0800241 -1.535
## thrilling      0.0075758 0.0734798 0.103
## beautiful      0.1222422 0.0718686 1.701
## fascinating    -0.0954774 0.0856783 -1.114
## emotional      -0.0532391 0.0606652 -0.878
## sad            0.0473514 0.0773016 0.613
##
## Correlation of Fixed Effects:
##              (Intr) intrst wllwrt of_h__ esy_t_ accssb thrlln beatfl fscntn
## interesting -0.200
## wellwritten -0.028 -0.048
## of_hgh_ltr_ -0.121 -0.059 -0.322
## esy_t_ndrst -0.180 0.020 -0.062 -0.079
## accessible -0.185 -0.065 0.012 0.273 -0.621
## thrilling -0.224 -0.063 0.063 -0.217 0.162 -0.246
## beautiful -0.258 -0.001 -0.183 0.027 0.105 0.091 -0.236
## fascinating -0.023 -0.554 -0.204 -0.059 -0.003 -0.029 -0.132 -0.092
## emotional -0.369 0.003 -0.044 -0.019 -0.105 0.116 -0.076 -0.085 0.008
## sad -0.732 0.267 -0.010 -0.157 0.139 -0.107 0.343 -0.016 0.019
##
##              emotnl
## interesting
## wellwritten
## of_hgh_ltr_
## esy_t_ndrst
## accessible
## thrilling
## beautiful
## fascinating
## emotional
## sad 0.206
## convergence code: 0
## boundary (singular) fit: see ?isSingular

```

```
lmFPCN_10item <- lm(roi_EmoNeg ~ interesting + wellwritten + of_high_literary_quality +
  easy_to_understand + accessible + thrilling + beautiful + fascinating
  emotional + sad, data = ROI_analysis)
summary(lmFPCN_10item)
```

```
##
## Call:
## lm(formula = roi_EmoNeg ~ interesting + wellwritten + of_high_literary_quality +
##     easy_to_understand + accessible + thrilling + beautiful +
##     fascinating + emotional + sad, data = ROI_analysis)
##
## Residuals:
```

	Min	1Q	Median	3Q	Max
	-0.26757	-0.06334	0.01212	0.07261	0.22138

```
##
## Coefficients:
```

	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	-0.226390	0.084029	-2.694	0.00839 **
interesting	0.032945	0.016071	2.050	0.04321 *
wellwritten	0.001736	0.014361	0.121	0.90403
of_high_literary_quality	-0.003881	0.012975	-0.299	0.76553
easy_to_understand	-0.001473	0.013758	-0.107	0.91497
accessible	0.015249	0.014719	1.036	0.30291
thrilling	0.015253	0.013496	1.130	0.26134
beautiful	0.011955	0.013101	0.912	0.36390
fascinating	-0.025131	0.015652	-1.606	0.11180
emotional	-0.009816	0.011125	-0.882	0.37991
sad	0.022188	0.014242	1.558	0.12267

```
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.1037 on 92 degrees of freedom
## (1 observation deleted due to missingness)
## Multiple R-squared:  0.1088, Adjusted R-squared:  0.01188
## F-statistic: 1.123 on 10 and 92 DF, p-value: 0.3541
```

```
lmIPL_10item <- lmer(roi_LitPos_IPL ~ interesting + wellwritten + of_high_literary_quali
  easy_to_understand + accessible + thrilling + beautiful + fascinating
  emotional + sad + (1|Story) + (1|fMRI_subj), data = ROI_analysis)
```

```
## boundary (singular) fit: see ?isSingular
```

```
summary(lmIPL_10item)
```

```
## Linear mixed model fit by REML ['lmerMod']
## Formula:
```

```

## roi_LitPos_IPL ~ interesting + wellwritten + of_high_literary_quality +
##     easy_to_understand + accessible + thrilling + beautiful +
##     fascinating + emotional + sad + (1 | Story) + (1 | fMRI_subj)
## Data: ROI_analysis
##
## REML criterion at convergence: 134.6
##
## Scaled residuals:
##      Min       1Q   Median       3Q      Max
## -1.73253 -0.77612  0.00161  0.67466  2.61391
##
## Random effects:
##   Groups      Name              Variance Std.Dev.
##   fMRI_subj (Intercept) 0.000000 0.00000
##   Story      (Intercept) 0.005843 0.07644
##   Residual                0.150089 0.38741
## Number of obs: 103, groups:  fMRI_subj, 52; Story, 2
##
## Fixed effects:
##
##              Estimate Std. Error t value
## (Intercept)      0.304284   0.321349   0.947
## interesting      0.095973   0.060245   1.593
## wellwritten     -0.025979   0.053977  -0.481
## of_high_literary_quality 0.030762   0.048599   0.633
## easy_to_understand -0.015104   0.052116  -0.290
## accessible      -0.005813   0.055085  -0.106
## thrilling       -0.049513   0.050565  -0.979
## beautiful       0.061853   0.049381   1.253
## fascinating     -0.062168   0.058895  -1.056
## emotional       0.017303   0.041734   0.415
## sad            -0.077062   0.053229  -1.448
##
## Correlation of Fixed Effects:
##              (Intr) intrst wllwrt of_h__ esy_t_ accssb thrlln beatfl fscntn
## interesting -0.201
## wellwritten -0.025 -0.050
## of_hgh_ltr_ -0.125 -0.057 -0.320
## esy_t_ndrst -0.178  0.017 -0.066 -0.076
## accessible -0.190 -0.064  0.014  0.273 -0.621
## thrilling  -0.226 -0.064  0.061 -0.216  0.160 -0.245
## beautiful  -0.259 -0.003 -0.187  0.030  0.100  0.093 -0.239
## fascinating -0.028 -0.553 -0.201 -0.061  0.002 -0.030 -0.131 -0.088
## emotional  -0.374  0.001 -0.046 -0.017 -0.109  0.117 -0.078 -0.089  0.010
## sad        -0.747  0.268 -0.010 -0.157  0.140 -0.107  0.344 -0.016  0.019
##
##              emotnl

```

```

## interesting
## wellwritten
## of_high_ltr_
## esy_t_ndrst
## accessible
## thrilling
## beautiful
## fascinating
## emotional
## sad          0.206
## convergence code: 0
## boundary (singular) fit: see ?isSingular

lmPrecu_10item <- lmer(roi_LitPos_Precu ~ interesting + wellwritten +
                        of_high_literary_quality +
                        easy_to_understand + accessible + thrilling + beautiful + fascinating
                        emotional + sad + (1|Story) + (1|fMRI_subj), data = ROI_analysis)
summary(lmPrecu_10item)

## Linear mixed model fit by REML ['lmerMod']
## Formula:
## roi_LitPos_Precu ~ interesting + wellwritten + of_high_literary_quality +
##     easy_to_understand + accessible + thrilling + beautiful +
##     fascinating + emotional + sad + (1 | Story) + (1 | fMRI_subj)
## Data: ROI_analysis
##
## REML criterion at convergence: 158.2
##
## Scaled residuals:
##      Min       1Q   Median       3Q      Max
## -3.00008 -0.49191 -0.00887  0.50424  2.83623
##
## Random effects:
## Groups      Name                Variance Std.Dev.
## fMRI_subj (Intercept) 2.754e-09 5.248e-05
## Story      (Intercept) 4.945e-03 7.032e-02
## Residual                1.945e-01 4.411e-01
## Number of obs: 103, groups: fMRI_subj, 52; Story, 2
##
## Fixed effects:
##              Estimate Std. Error t value
## (Intercept)    0.034030   0.363543   0.094
## interesting    0.073082   0.068554   1.066
## wellwritten   -0.025794   0.061394  -0.420
## of_high_literary_quality 0.019101   0.055309   0.345

```



```
## easy_to_understand      0.103840    0.059203    1.754
## accessible              -0.127399    0.062700   -2.032
## thrilling               0.026237    0.057544    0.456
## beautiful              0.096067    0.056141    1.711
## fascinating            -0.074047    0.066977   -1.106
## emotional              0.001824    0.047484    0.038
## sad                    -0.008067    0.060600   -0.133
##
## Correlation of Fixed Effects:
##          (Intr) intrst wllwrt of_h__ esy_t_ accssb thrlln beatfl fscntn
## interesting -0.201
## wellwritten -0.023 -0.052
## of_hgh_ltr_ -0.128 -0.056 -0.320
## esy_t_ndrst -0.176  0.015 -0.070 -0.075
## accessible -0.192 -0.064  0.015  0.272 -0.621
## thrilling  -0.226 -0.065  0.060 -0.216  0.159 -0.244
## beautiful  -0.258 -0.005 -0.190  0.031  0.097  0.095 -0.241
## fascinating -0.030 -0.552 -0.200 -0.062  0.005 -0.031 -0.129 -0.086
## emotional  -0.375  0.000 -0.048 -0.016 -0.112  0.118 -0.079 -0.091  0.012
## sad        -0.751  0.268 -0.010 -0.158  0.140 -0.107  0.344 -0.016  0.019
##          emotnl
## interesting
## wellwritten
## of_hgh_ltr_
## esy_t_ndrst
## accessible
## thrilling
## beautiful
## fascinating
## emotional
## sad          0.207
```

```
lmSTG_10item <- lmer(roi_LitNeg ~ interesting + wellwritten + of_high_literary_quality +
  easy_to_understand + accessible + thrilling + beautiful + fascinating
  emotional + sad + (1|Story) + (1|fMRI_subj), data = ROI_analysis)
```

```
## boundary (singular) fit: see ?isSingular
```

```
summary(lmSTG_10item)
```

```
## Linear mixed model fit by REML ['lmerMod']
## Formula:
## roi_LitNeg ~ interesting + wellwritten + of_high_literary_quality +
##   easy_to_understand + accessible + thrilling + beautiful +
##   fascinating + emotional + sad + (1 | Story) + (1 | fMRI_subj)
## Data: ROI_analysis
```

```

##
## REML criterion at convergence: 166.4
##
## Scaled residuals:
##      Min       1Q   Median       3Q      Max
## -2.4668 -0.5201  0.1004  0.6189  1.8401
##
## Random effects:
##   Groups      Name             Variance Std.Dev.
##  fMRI_subj (Intercept) 0.0000    0.0000
##   Story      (Intercept) 0.0000    0.0000
##   Residual                0.2144    0.4631
## Number of obs: 103, groups:  fMRI_subj, 52; Story, 2
##
## Fixed effects:
##
##              Estimate Std. Error t value
## (Intercept)    -0.110589    0.375373  -0.295
## interesting      0.071212    0.071791   0.992
## wellwritten     -0.048756    0.064152  -0.760
## of_high_literary_quality 0.098389    0.057961   1.697
## easy_to_understand 0.088816    0.061460   1.445
## accessible     -0.015166    0.065754  -0.231
## thrilling       0.009118    0.060289   0.151
## beautiful      -0.006600    0.058526  -0.113
## fascinating     -0.059358    0.069921  -0.849
## emotional      -0.071850    0.049698  -1.446
## sad            -0.075027    0.063620  -1.179
##
## Correlation of Fixed Effects:
##              (Intr) intrst wllwrt of_h__ esy_t_ accssb thrlln beatfl fscntn
## interesting -0.196
## wellwritten -0.012 -0.059
## of_hgh_ltr_ -0.137 -0.052 -0.316
## esy_t_ndrst -0.163  0.004 -0.085 -0.067
## accessible -0.201 -0.061  0.019  0.270 -0.622
## thrilling  -0.223 -0.070  0.054 -0.213  0.151 -0.242
## beautiful  -0.250 -0.013 -0.204  0.039  0.080  0.101 -0.251
## fascinating -0.044 -0.549 -0.191 -0.069  0.021 -0.036 -0.124 -0.075
## emotional  -0.373 -0.006 -0.056 -0.012 -0.125  0.122 -0.084 -0.101  0.020
## sad        -0.765  0.269 -0.009 -0.158  0.143 -0.108  0.345 -0.015  0.018
##            emotnl
## interesting
## wellwritten
## of_hgh_ltr_
## esy_t_ndrst

```

```

## accessible
## thrilling
## beautiful
## fascinating
## emotional
## sad          0.208
## convergence code: 0
## boundary (singular) fit: see ?isSingular
#ROI predicted by individual questionnaire results
lmIPL_qnns <- lmer(roi_LitPos_IPL ~ care_about_style + like_fiction + num_novels_lastyr +
                  often_read + IRI_fantasy + need_for_cognition + need_for_affect +
                  author_recog + EQ + (1|Story) + (1|fMRI_subj), data = ROI_analysis)

## boundary (singular) fit: see ?isSingular

summary(lmIPL_qnns)

## Linear mixed model fit by REML ['lmerMod']
## Formula:
## roi_LitPos_IPL ~ care_about_style + like_fiction + num_novels_lastyr +
##   often_read + IRI_fantasy + need_for_cognition + need_for_affect +
##   author_recog + EQ + (1 | Story) + (1 | fMRI_subj)
## Data: ROI_analysis
##
## REML criterion at convergence: 155.9
##
## Scaled residuals:
##      Min       1Q   Median       3Q      Max
## -1.84493 -0.64244 -0.07823  0.76039  2.22406
##
## Random effects:
##   Groups      Name              Variance Std.Dev.
##   fMRI_subj (Intercept) 0.000000 0.00000
##   Story      (Intercept) 0.000588 0.02425
##   Residual                0.146570 0.38284
## Number of obs: 104, groups: fMRI_subj, 52; Story, 2
##
## Fixed effects:
##              Estimate Std. Error t value
## (Intercept)    0.8408274  0.4064095   2.069
## care_about_style  0.0238535  0.0375145   0.636
## like_fiction     0.0345611  0.0383324   0.902
## num_novels_lastyr -0.0069707  0.0043354  -1.608
## often_read       0.0224368  0.0605639   0.370
## IRI_fantasy     -0.0280376  0.0130986  -2.141

```

```

## need_for_cognition -0.0005117  0.0033357  -0.153
## need_for_affect    -0.0052433  0.0051125  -1.026
## author_recog       0.0102507  0.0102245   1.003
## EQ                 -0.0017983  0.0044214  -0.407
##
## Correlation of Fixed Effects:
##          (Intr) cr_bt_ lk_fct nm_nv_ oftn_r IRI_fn nd_fr_c nd_fr_f
## car_bt_styl -0.268
## like_fictin  0.123 -0.153
## nm_nvls_lst  0.041 -0.072 -0.084
## often_read  -0.250 -0.017 -0.520 -0.414
## IRI_fantasy -0.353  0.060 -0.412  0.330  0.025
## nd_fr_cgntn -0.356 -0.186  0.048 -0.225  0.087 -0.321
## ned_fr_ffct -0.359  0.094  0.021 -0.111  0.107 -0.089 -0.107
## author_recg  0.084 -0.157  0.027 -0.017 -0.270  0.047 -0.097  -0.112
## EQ          -0.153 -0.156 -0.111  0.230  0.079  0.001  0.010  -0.400
##          athr_r
## car_bt_styl
## like_fictin
## nm_nvls_lst
## often_read
## IRI_fantasy
## nd_fr_cgntn
## ned_fr_ffct
## author_recg
## EQ          -0.011
## convergence code: 0
## boundary (singular) fit: see ?isSingular

lmIFG_qnns <- lmer(roi_LitPos_IFG ~ care_about_style + like_fiction + num_novels_lastyr +
                  often_read + IRI_fantasy + need_for_cognition + need_for_
                  author_recog + EQ + (1|Story) + (1|fMRI_subj), data = ROI

## boundary (singular) fit: see ?isSingular

summary(lmIFG_qnns)

## Linear mixed model fit by REML ['lmerMod']
## Formula:
## roi_LitPos_IFG ~ care_about_style + like_fiction + num_novels_lastyr +
##      often_read + IRI_fantasy + need_for_cognition + need_for_affect +
##      author_recog + EQ + (1 | Story) + (1 | fMRI_subj)
##      Data: ROI_analysis
##
## REML criterion at convergence: 231.1
##

```

```

## Scaled residuals:
##      Min       1Q   Median       3Q      Max
## -2.1862 -0.5892 -0.1389  0.6352  2.5165
##
## Random effects:
##   Groups      Name                Variance Std.Dev.
##  fMRI_subj (Intercept) 0.00000    0.0000
##   Story      (Intercept) 0.01557    0.1248
##   Residual                0.32270    0.5681
## Number of obs: 104, groups: fMRI_subj, 52; Story, 2
##
## Fixed effects:
##              Estimate Std. Error t value
## (Intercept)    0.1222608  0.6089278   0.201
## care_about_style 0.0626073  0.0556646   1.125
## like_fiction    0.0213990  0.0568782   0.376
## num_novels_lastyr -0.0013440  0.0064330  -0.209
## often_read      0.1005469  0.0898656   1.119
## IRI_fantasy     -0.0092241  0.0194359  -0.475
## need_for_cognition -0.0041104  0.0049496  -0.830
## need_for_affect   0.0017295  0.0075860   0.228
## author_recog    -0.0188326  0.0151712  -1.241
## EQ              0.0001731  0.0065605   0.026
##
## Correlation of Fixed Effects:
##              (Intr) cr_bt_ lk_fct nm_nv_ oftn_r IRI_fn nd_fr_c nd_fr_f
## car_bt_styl -0.266
## like_fictin  0.121 -0.153
## nm_nvls_lst  0.040 -0.072 -0.084
## often_read  -0.248 -0.017 -0.520 -0.414
## IRI_fantasy -0.350  0.060 -0.412  0.330  0.025
## nd_fr_cgntn -0.352 -0.186  0.048 -0.225  0.087 -0.321
## ned_fr_ffct -0.356  0.094  0.021 -0.111  0.107 -0.089 -0.107
## author_recg  0.084 -0.157  0.027 -0.017 -0.270  0.047 -0.097 -0.112
## EQ          -0.152 -0.156 -0.111  0.230  0.079  0.001  0.010 -0.400
##              athr_r
## car_bt_styl
## like_fictin
## nm_nvls_lst
## often_read
## IRI_fantasy
## nd_fr_cgntn
## ned_fr_ffct
## author_recg
## EQ          -0.011

```

```

## convergence code: 0
## boundary (singular) fit: see ?isSingular

lmPrecu_qnns <- lmer(roi_LitPos_Precu ~ care_about_style + like_fiction + num_novels_lastyr +
                    often_read + IRI_fantasy + need_for_cognition + need_for_affect +
                    author_recog + EQ + (1|Story) + (1|fMRI_subj), data = ROI_analysis)

## boundary (singular) fit: see ?isSingular

summary(lmPrecu_qnns)

## Linear mixed model fit by REML ['lmerMod']
## Formula:
## roi_LitPos_Precu ~ care_about_style + like_fiction + num_novels_lastyr +
##   often_read + IRI_fantasy + need_for_cognition + need_for_affect +
##   author_recog + EQ + (1 | Story) + (1 | fMRI_subj)
## Data: ROI_analysis
##
## REML criterion at convergence: 188.9
##
## Scaled residuals:
##      Min       1Q   Median       3Q      Max
## -3.09251 -0.56900  0.00773  0.45279  2.68262
##
## Random effects:
##   Groups      Name              Variance Std.Dev.
##   fMRI_subj (Intercept) 0.0000    0.0000
##   Story      (Intercept) 0.0000    0.0000
##   Residual                0.2088    0.4569
## Number of obs: 104, groups:  fMRI_subj, 52; Story, 2
##
## Fixed effects:
##              Estimate Std. Error t value
## (Intercept)    0.6039188  0.4846451   1.246
## care_about_style -0.0353514  0.0447761  -0.790
## like_fiction     0.0318434  0.0457523   0.696
## num_novels_lastyr 0.0018756  0.0051746   0.362
## often_read     -0.0428669  0.0722870  -0.593
## IRI_fantasy    -0.0104074  0.0156340  -0.666
## need_for_cognition 0.0028249  0.0039814   0.710
## need_for_affect -0.0057142  0.0061021  -0.936
## author_recog   -0.0034138  0.0122036  -0.280
## EQ              0.0009824  0.0052772   0.186
##
## Correlation of Fixed Effects:
##              (Intr) cr_bt_ lk_fct nm_nv_ oftn_r IRI_fn nd_fr_c nd_fr_f

```

```

## car_bt_styl -0.269
## like_fictin  0.123 -0.153
## nm_nvls_lst  0.041 -0.072 -0.084
## often_read  -0.250 -0.017 -0.520 -0.414
## IRI_fantasy -0.354  0.060 -0.412  0.330  0.025
## nd_fr_cgntn -0.356 -0.186  0.048 -0.225  0.087 -0.321
## ned_fr_ffct -0.359  0.094  0.021 -0.111  0.107 -0.089 -0.107
## author_recg  0.085 -0.157  0.027 -0.017 -0.270  0.047 -0.097  -0.112
## EQ          -0.153 -0.156 -0.111  0.230  0.079  0.001  0.010  -0.400
##
##          athr_r
## car_bt_styl
## like_fictin
## nm_nvls_lst
## often_read
## IRI_fantasy
## nd_fr_cgntn
## ned_fr_ffct
## author_recg
## EQ          -0.011
## convergence code: 0
## boundary (singular) fit: see ?isSingular

lmSTG_qnns <- lmer(roi_LitNeg ~ care_about_style + like_fiction + num_novels_lastyr +
                  often_read + IRI_fantasy + need_for_cognition + need_for_
                  author_recog + EQ + (1|Story) + (1|fMRI_subj), data = ROI

## boundary (singular) fit: see ?isSingular

summary(lmSTG_qnns)

## Linear mixed model fit by REML ['lmerMod']
## Formula:
## roi_LitNeg ~ care_about_style + like_fiction + num_novels_lastyr +
##   often_read + IRI_fantasy + need_for_cognition + need_for_affect +
##   author_recog + EQ + (1 | Story) + (1 | fMRI_subj)
## Data: ROI_analysis
##
## REML criterion at convergence: 201.5
##
## Scaled residuals:
##      Min       1Q   Median       3Q      Max
## -2.3020 -0.6365  0.1505  0.4980  2.2078
##
## Random effects:
##  Groups      Name                Variance Std.Dev.
##  fMRI_subj (Intercept) 4.445e-10 2.108e-05

```

```

## Story      (Intercept) 0.000e+00 0.000e+00
## Residual          2.387e-01 4.886e-01
## Number of obs: 104, groups: fMRI_subj, 52; Story, 2
##
## Fixed effects:
##              Estimate Std. Error t value
## (Intercept)    0.532089   0.518186   1.027
## care_about_style -0.032364   0.047875  -0.676
## like_fiction     0.029499   0.048919   0.603
## num_novels_lastyr 0.002226   0.005533   0.402
## often_read       0.005464   0.077290   0.071
## IRI_fantasy      -0.012369   0.016716  -0.740
## need_for_cognition -0.003955   0.004257  -0.929
## need_for_affect   -0.004389   0.006524  -0.673
## author_recog      -0.008083   0.013048  -0.619
## EQ                0.003659   0.005642   0.649
##
## Correlation of Fixed Effects:
##              (Intr) cr_bt_ lk_fct nm_nv_ oftn_r IRI_fn nd_fr_c nd_fr_f
## car_bt_styl -0.269
## like_fictin  0.123 -0.153
## nm_nvls_lst  0.041 -0.072 -0.084
## often_read  -0.250 -0.017 -0.520 -0.414
## IRI_fantasy -0.354  0.060 -0.412  0.330  0.025
## nd_fr_cgntn -0.356 -0.186  0.048 -0.225  0.087 -0.321
## ned_fr_ffct -0.359  0.094  0.021 -0.111  0.107 -0.089 -0.107
## author_recg  0.085 -0.157  0.027 -0.017 -0.270  0.047 -0.097 -0.112
## EQ          -0.153 -0.156 -0.111  0.230  0.079  0.001  0.010 -0.400
##              athr_r
## car_bt_styl
## like_fictin
## nm_nvls_lst
## often_read
## IRI_fantasy
## nd_fr_cgntn
## ned_fr_ffct
## author_recg
## EQ          -0.011
## convergence code: 0
## boundary (singular) fit: see ?isSingular

lmFPCN_qnns <- lmer(roi_EmoNeg ~ care_about_style + like_fiction + num_novels_lastyr +
                    often_read + IRI_fantasy + need_for_cognition + need_for_
                    author_recog + EQ + (1|Story) + (1|fMRI_subj), data = ROI
summary(lmFPCN_qnns)

```



```

## Linear mixed model fit by REML ['lmerMod']
## Formula:
## roi_EmoNeg ~ care_about_style + like_fiction + num_novels_lastyr +
##   often_read + IRI_fantasy + need_for_cognition + need_for_affect +
##   author_recog + EQ + (1 | Story) + (1 | fMRI_subj)
##   Data: ROI_analysis
##
## REML criterion at convergence: -90.4
##
## Scaled residuals:
##      Min       1Q   Median       3Q      Max
## -2.54575 -0.49861  0.04056  0.52699  2.25472
##
## Random effects:
##   Groups      Name      Variance Std.Dev.
##   fMRI_subj (Intercept) 0.0005766 0.02401
##   Story      (Intercept) 0.0010732 0.03276
##   Residual                0.0099802 0.09990
## Number of obs: 104, groups:  fMRI_subj, 52; Story, 2
##
## Fixed effects:
##              Estimate Std. Error t value
## (Intercept)   -0.1267265  0.1142819  -1.109
## care_about_style  0.0004649  0.0103393   0.045
## like_fiction    0.0039358  0.0105647   0.373
## num_novels_lastyr -0.0008965  0.0011949  -0.750
## often_read      -0.0007052  0.0166918  -0.042
## IRI_fantasy     -0.0012197  0.0036101  -0.338
## need_for_cognition 0.0010837  0.0009194   1.179
## need_for_affect  -0.0016487  0.0014090  -1.170
## author_recog    -0.0031679  0.0028179  -1.124
## EQ              0.0015701  0.0012186   1.289
##
## Correlation of Fixed Effects:
##              (Intr) cr_bt_ lk_fct nm_nv_ oftn_r IRI_fn nd_fr_c nd_fr_f
## car_bt_styl -0.263
## like_fictin  0.120 -0.153
## nm_nvls_lst  0.040 -0.072 -0.084
## often_read  -0.245 -0.017 -0.520 -0.414
## IRI_fantasy -0.346  0.060 -0.412  0.330  0.025
## nd_fr_cgntn -0.349 -0.186  0.048 -0.225  0.087 -0.321
## ned_fr_ffct -0.352  0.094  0.021 -0.111  0.107 -0.089 -0.107
## author_recg  0.083 -0.157  0.027 -0.017 -0.270  0.047 -0.097 -0.112
## EQ          -0.150 -0.156 -0.111  0.230  0.079  0.001  0.010 -0.400
## athr_r

```

```
## car_bt_styl
## like_fictin
## nm_nvls_lst
## often_read
## IRI_fantasy
## nd_fr_cgntn
## ned_fr_ffct
## author_recg
## EQ          -0.011
```