

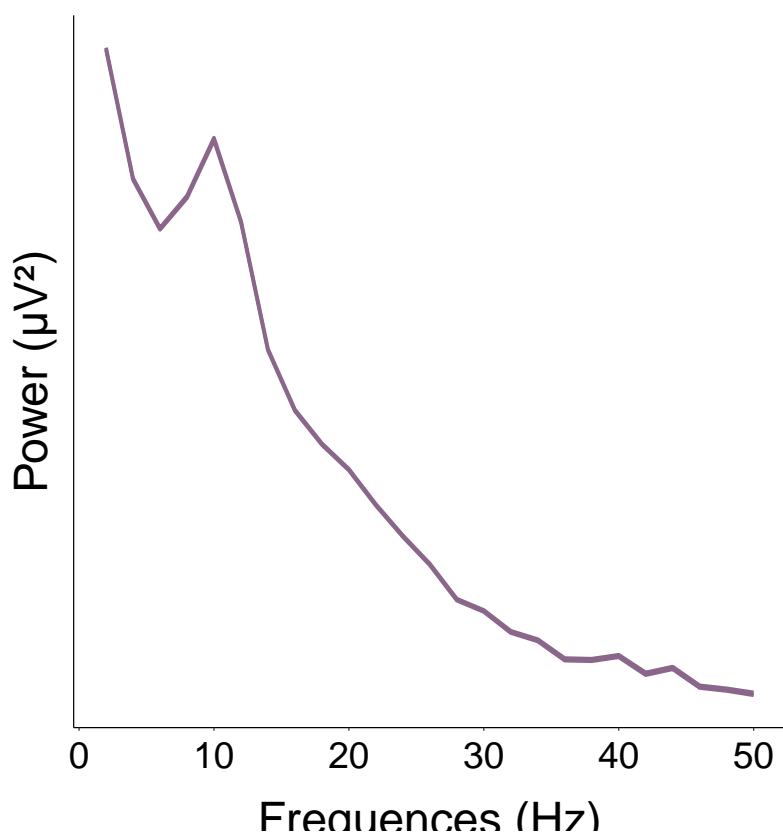
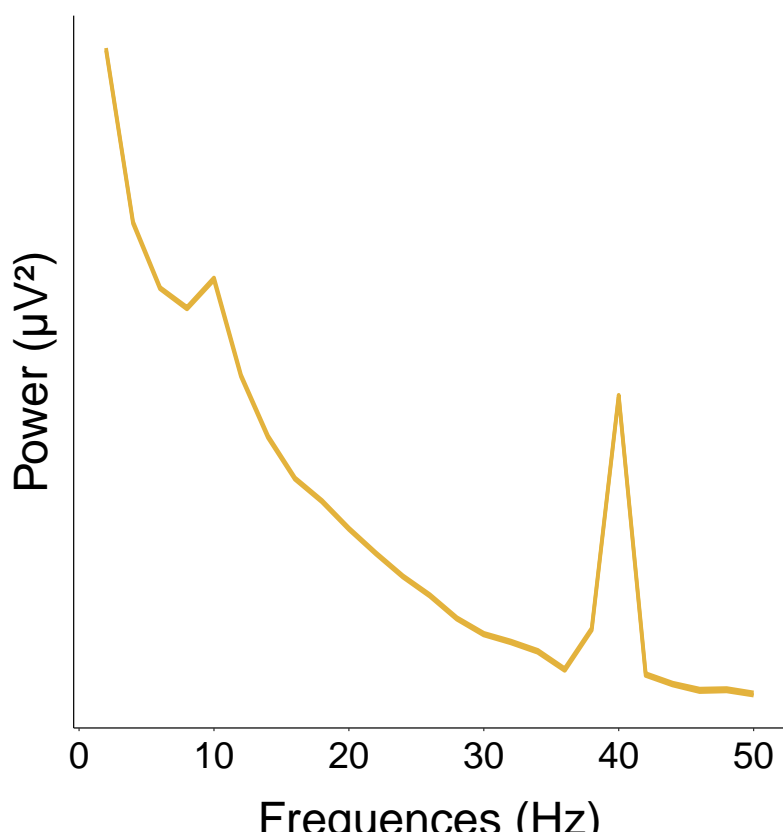
SNR Paper Figures

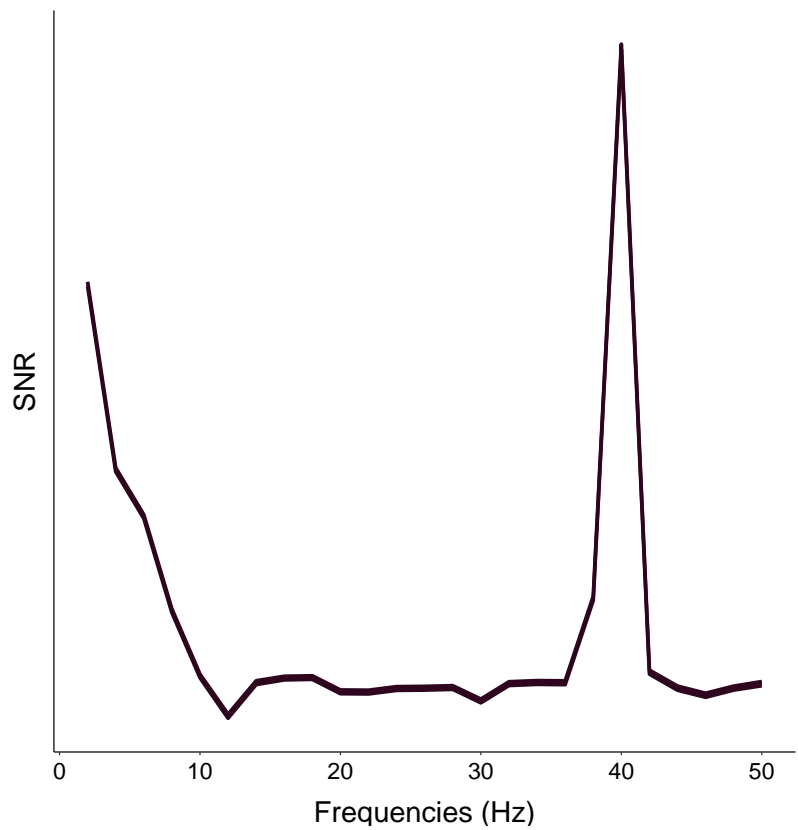
2024-01-29

Contents

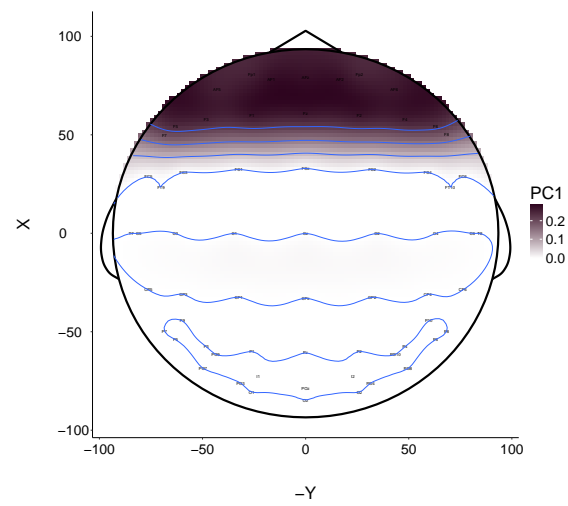
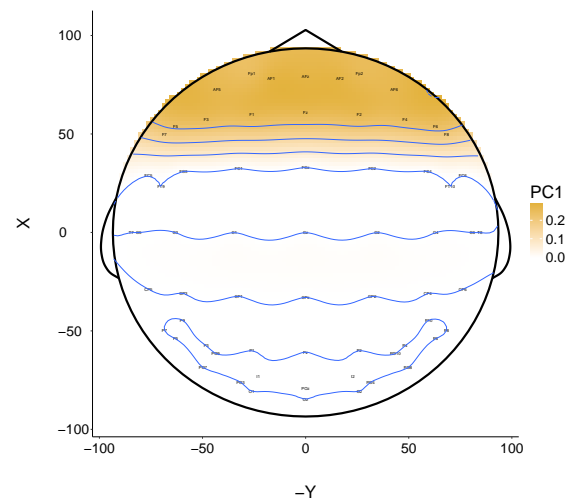
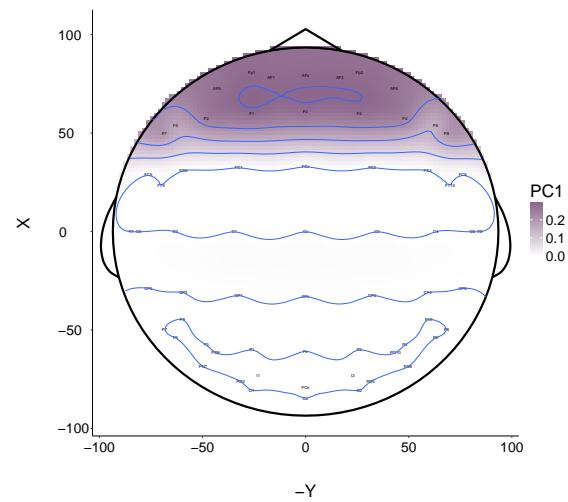
SNR across freqs	2
Topo plots	4
Age plots	5
Load MRSI	11
L Glu	11
L Imbalance	13
Behavior	15
Behavior Loops	26

SNR across freqs

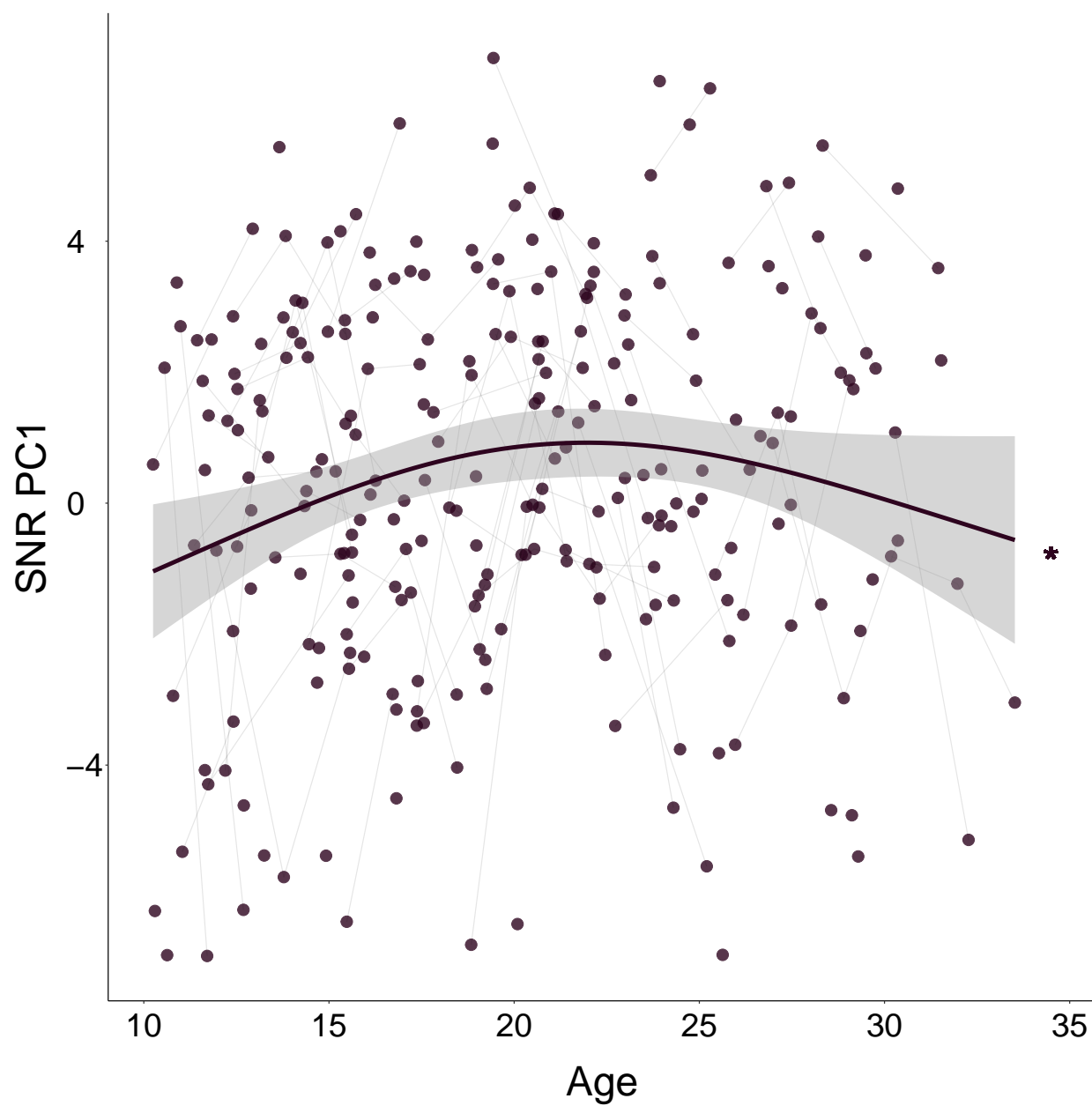




Topo plots

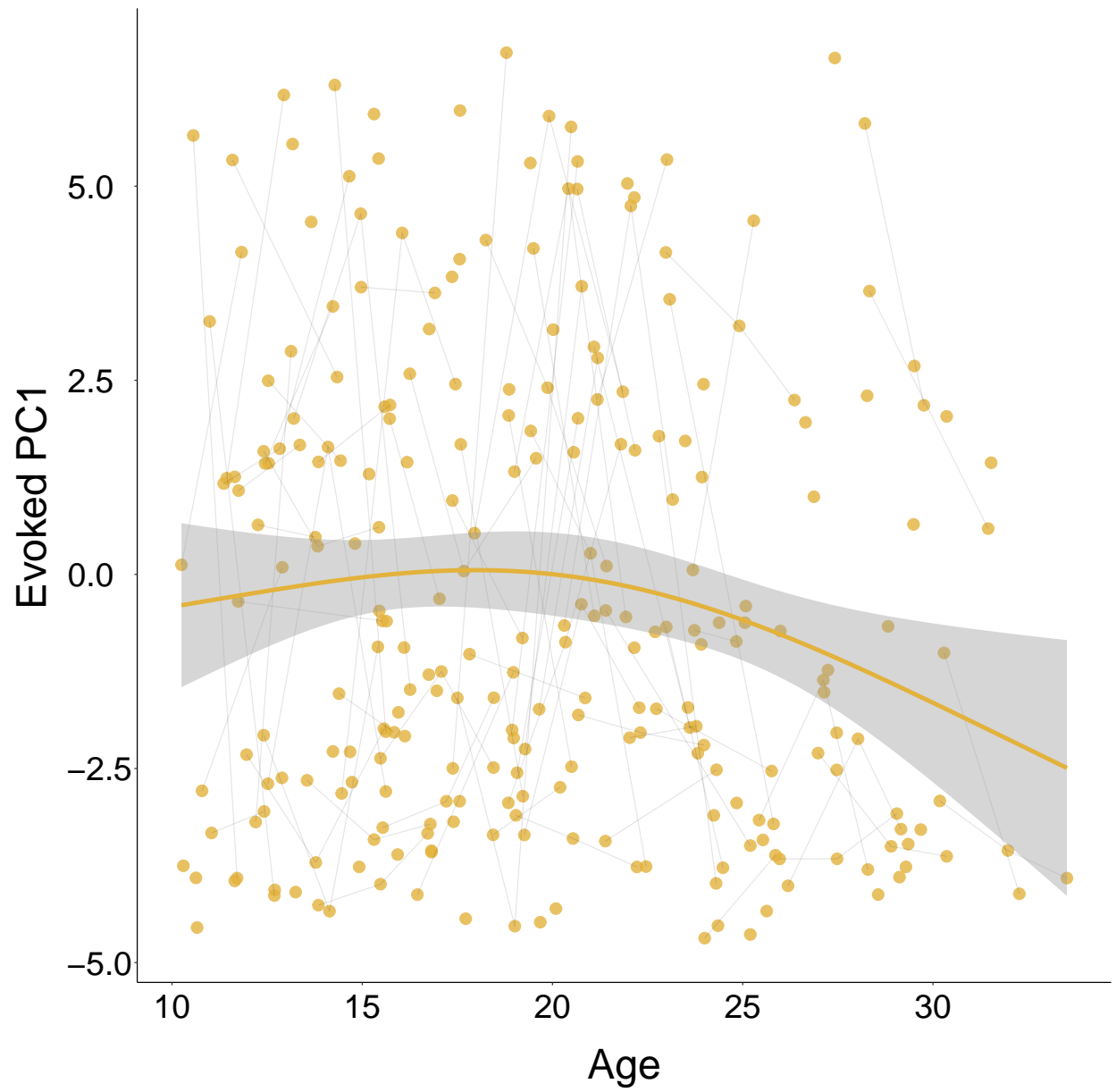


Age plots



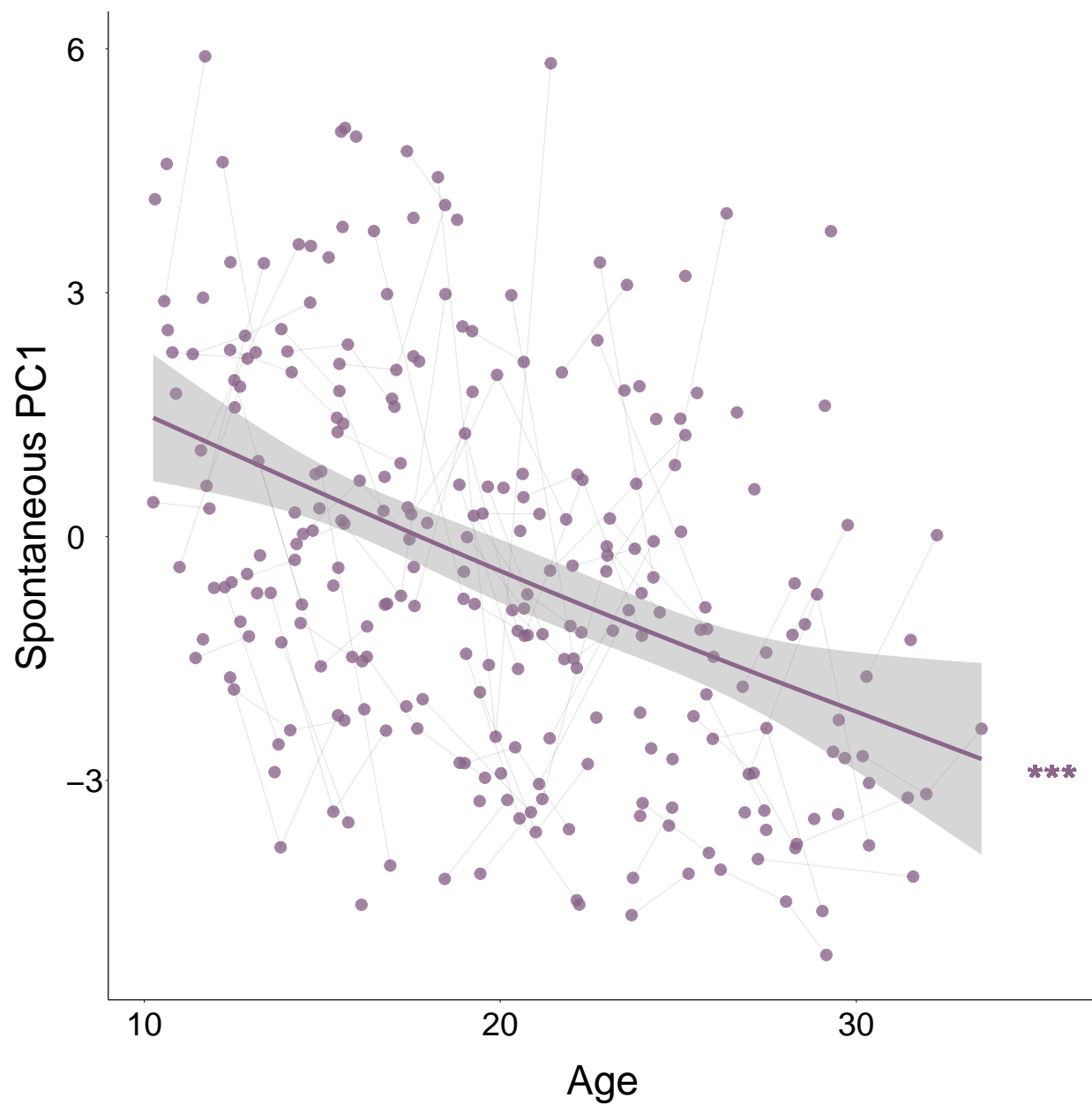
```
##  
## Family: gaussian  
## Link function: identity
```

```
##
## Formula:
## pc1 ~ s(age, k = 3)
##
## Parametric coefficients:
##           Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.3509      0.2103   1.669  0.0963 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Approximate significance of smooth terms:
##           edf Ref.df      F p-value
## s(age) 1.838  1.838 4.597  0.0447 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## R-sq.(adj) =  0.0249
##   Scale est. = 5.0525    n = 258
```



```
##  
## Family: gaussian  
## Link function: identity  
##  
## Formula:  
## pc1 ~ s(age, k = 3)
```

```
##
## Parametric coefficients:
##           Estimate Std. Error t value Pr(>|t|)
## (Intercept) -0.3165      0.2088  -1.516   0.131
##
## Approximate significance of smooth terms:
##           edf Ref.df      F p-value
## s(age) 1.677  1.677 1.456   0.137
##
## R-sq.(adj) =  0.0203
##   Scale est. = 6.3549    n = 259
```

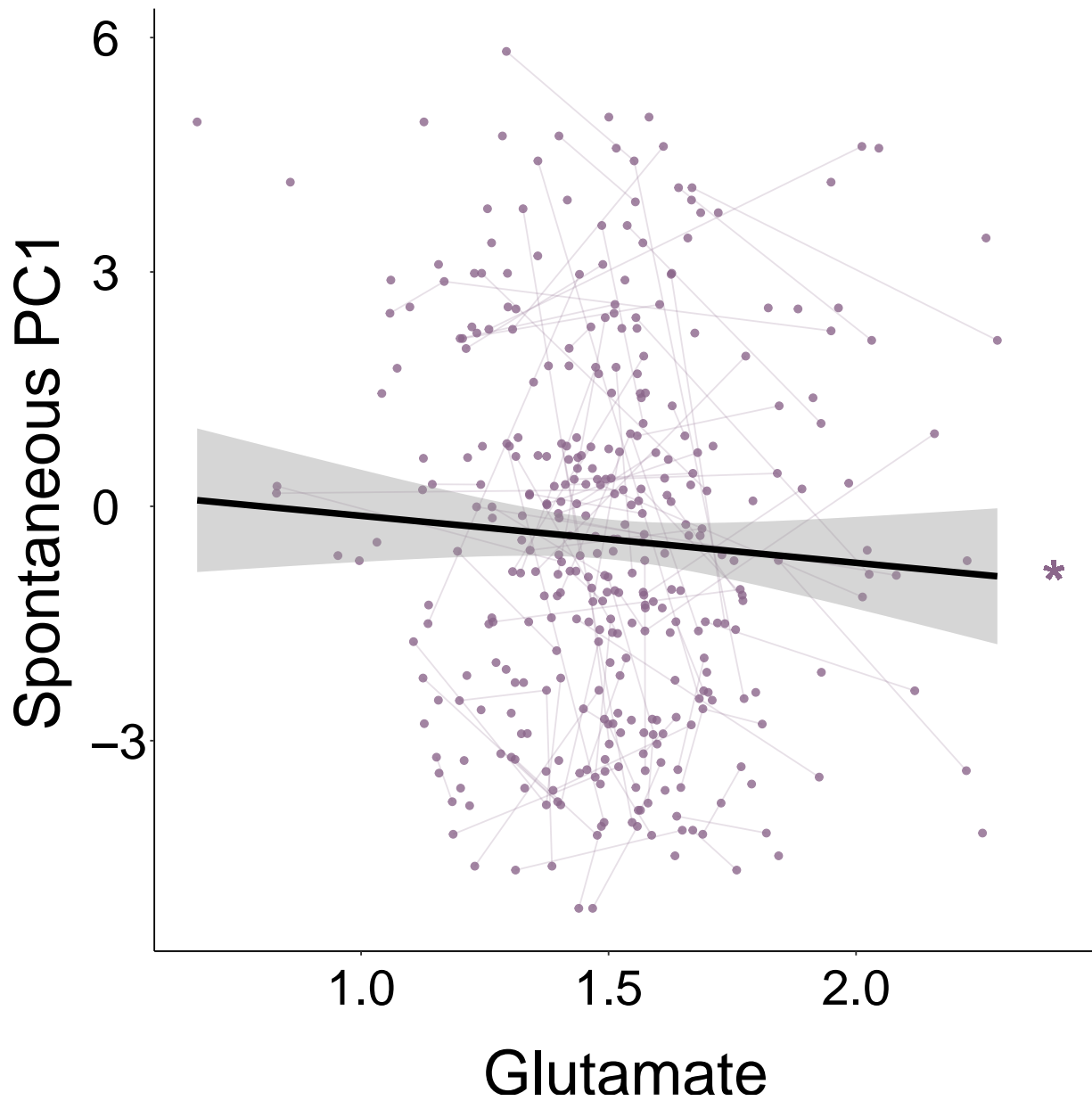



```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## pc1 ~ s(age, k = 3)
```

```
##
## Parametric coefficients:
##           Estimate Std. Error t value Pr(>|t|)
## (Intercept) -0.2716      0.1627  -1.669   0.0963 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Approximate significance of smooth terms:
##           edf Ref.df      F p-value
## s(age)      1       1 37.53 <2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## R-sq.(adj) =  0.172
##   Scale est. = 2.0875    n = 263
```

Load MRSI

L Glu



```
## Linear mixed model fit by REML. t-tests use Satterthwaite's method [  
## lmerModLmerTest]  
## Formula: Glu ~ age + pc1 + region + (1 | lunaID)  
## Data: allmeasures_mrs %>% filter(measure == "Induced")  
##  
## REML criterion at convergence: -9.5  
##  
## Scaled residuals:  
##      Min       1Q   Median       3Q      Max
```

```

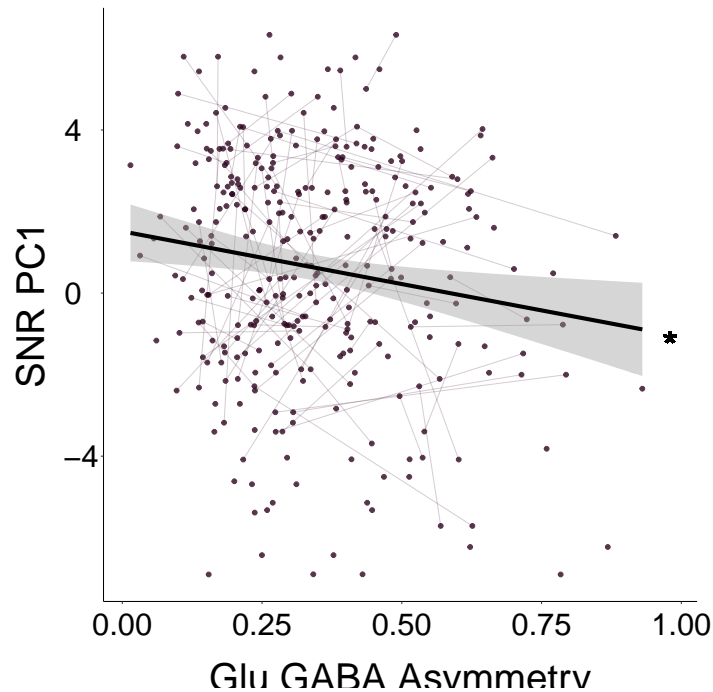
## -3.13660 -0.47060 -0.01668 0.42990 2.96614
##
## Random effects:
## Groups Name Variance Std.Dev.
## lunaID (Intercept) 0.01255 0.1120
## Residual 0.04276 0.2068
## Number of obs: 353, groups: lunaID, 137
##
## Fixed effects:
## Estimate Std. Error df t value Pr(>|t|)
## (Intercept) 1.675344 0.060896 162.017506 27.512 < 2e-16 ***
## age -0.007046 0.002973 158.194647 -2.370 0.019005 *
## pc1 -0.014924 0.006525 207.195519 -2.287 0.023191 *
## regionRDLPFC -0.084558 0.022264 237.645287 -3.798 0.000185 ***
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Correlation of Fixed Effects:
## (Intr) age pc1
## age -0.951
## pc1 -0.387 0.436
## reginRDLPFC -0.191 0.005 0.023

## Linear mixed model fit by REML. t-tests use Satterthwaite's method [
## lmerModLmerTest]
## Formula: Glu ~ age * pc1 + region + (1 | lunaID)
## Data: allmeasures_mrs %>% filter(measure == "Induced")
##
## REML criterion at convergence: 0.2
##
## Scaled residuals:
## Min 1Q Median 3Q Max
## -3.3418 -0.4713 0.0225 0.4534 2.9982
##
## Random effects:
## Groups Name Variance Std.Dev.
## lunaID (Intercept) 0.01290 0.1136
## Residual 0.04239 0.2059
## Number of obs: 353, groups: lunaID, 137
##
## Fixed effects:
## Estimate Std. Error df t value Pr(>|t|)
## (Intercept) 1.694244 0.062477 163.915722 27.118 < 2e-16 ***
## age -0.008544 0.003161 164.540563 -2.703 0.007594 **
## pc1 0.016911 0.023458 183.690555 0.721 0.471889
## regionRDLPFC -0.083877 0.022179 236.188061 -3.782 0.000197 ***
## age:pc1 -0.001652 0.001167 178.859794 -1.415 0.158851
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Correlation of Fixed Effects:
## (Intr) age pc1 rRDLPF
## age -0.947
## pc1 0.098 -0.204

```

```
## reginRDLPFC -0.181 -0.003 0.027
## age:pc1      -0.212 0.332 -0.960 -0.021
```

L Imbalance

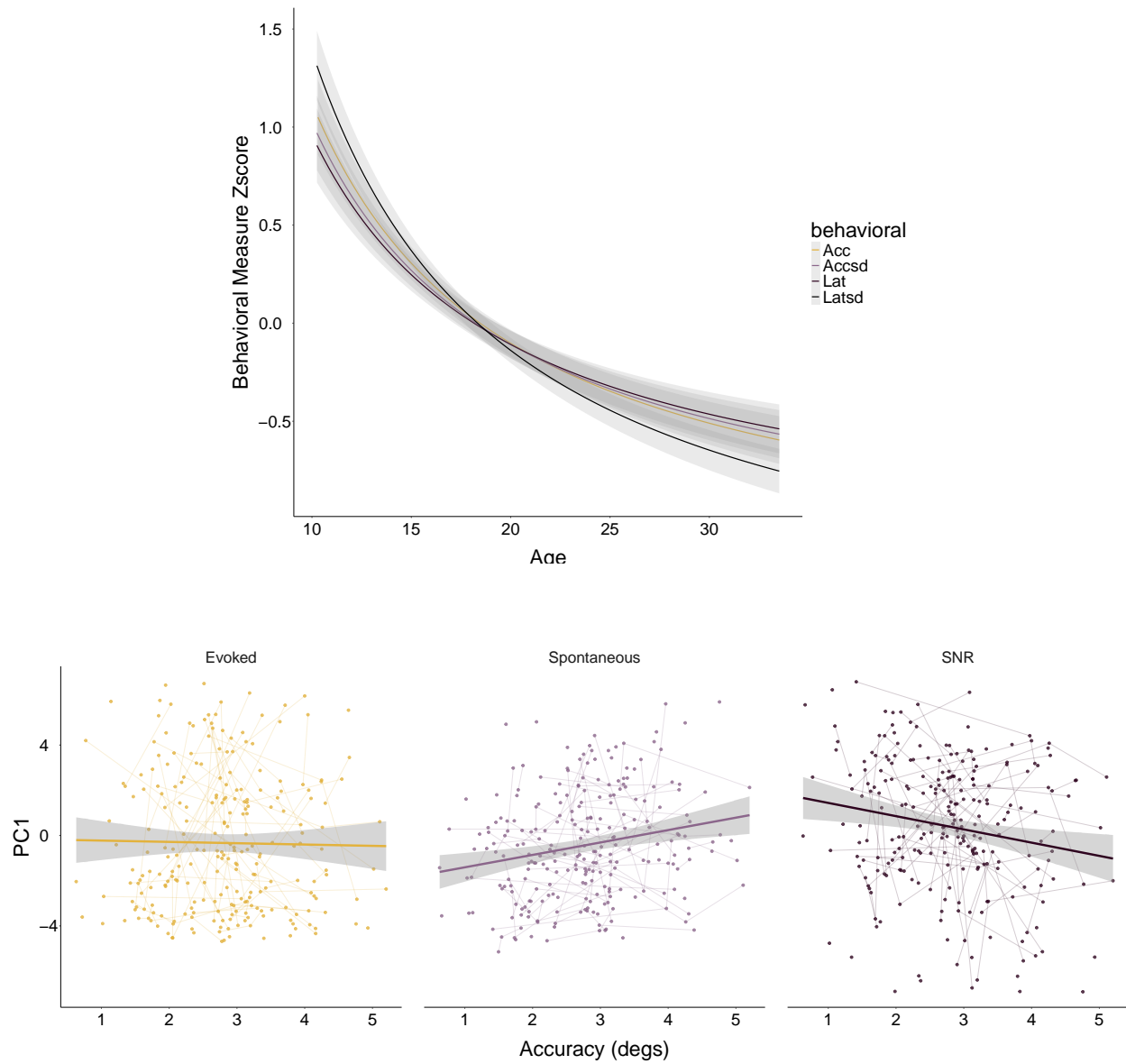


```
## Linear mixed model fit by REML. t-tests use Satterthwaite's method [
## lmerModLmerTest]
## Formula: sqrt(GluGABAimbalanceABS) ~ age + pc1 + region + (1 | lunaID)
## Data: allmeasures_mrs %>% filter(measure == "SNR")
##
## REML criterion at convergence: -214.9
##
## Scaled residuals:
##      Min       1Q   Median       3Q      Max
## -1.9542 -0.7981 -0.0980  0.6834  3.2471
##
## Random effects:
## Groups   Name            Variance Std.Dev.
## lunaID   (Intercept)  0.00000  0.0000
## Residual                    0.02676  0.1636
## Number of obs: 313, groups:  lunaID, 130
##
## Fixed effects:
##              Estimate Std. Error    df t value Pr(>|t|)
## (Intercept)   0.473800   0.036210 309.000000   13.085 < 2e-16 ***
## age           -0.005823   0.001717 309.000000   -3.392 0.000784 ***
## pc1           -0.007752   0.003253 309.000000   -2.383 0.017770 *
## reginRDLPFC  -0.018898   0.018502 309.000000   -1.021 0.307873
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
##
## Correlation of Fixed Effects:
##           (Intr) age    pc1
## age      -0.930
## pc1       0.042 -0.100
## reginRDL PFC -0.281  0.025 -0.020
## optimizer (nloptwrap) convergence code: 0 (OK)
## boundary (singular) fit: see help('isSingular')

## Linear mixed model fit by REML. t-tests use Satterthwaite's method [
## lmerModLmerTest]
## Formula: pc1 ~ age * sqrt(GluGABAimbalanceABS) + region + (1 | lunaID)
## Data: allmeasures_mrs %>% filter(measure == "SNR")
##
## REML criterion at convergence: 1382.6
##
## Scaled residuals:
##      Min       1Q   Median       3Q      Max
## -2.70720 -0.41162  0.01642  0.36682  2.36994
##
## Random effects:
## Groups Name Variance Std.Dev.
## lunaID (Intercept) 6.511 2.552
## Residual 2.016 1.420
## Number of obs: 313, groups: lunaID, 130
##
## Fixed effects:
##              Estimate Std. Error    df t value Pr(>|t|)
## (Intercept)    0.18939    1.17204 291.40830   0.162   0.872
## age            0.01462    0.05854 294.68436   0.250   0.803
## sqrt(GluGABAimbalanceABS) -2.20552    2.15918 222.67825  -1.021   0.308
## regionRDL PFC    0.03943    0.16949 187.15986   0.233   0.816
## age:sqrt(GluGABAimbalanceABS) 0.11980    0.11713 224.71739   1.023   0.307
##
## Correlation of Fixed Effects:
##           (Intr) age    s(GGAB rRDL PFC
## age      -0.957
## s(GGABAABS) -0.699  0.707
## reginRDL PFC -0.113  0.033  0.043
## a:(GGABAABS  0.658 -0.722 -0.958 -0.033
```

Behavior



```
## Linear mixed model fit by REML. t-tests use Satterthwaite's method [
## lmerModLmerTest]
## Formula: pc1 ~ age + absBestError + (1 | lunaID)
## Data: SNRbehavior %>% filter(measure == "SNR")
##
## REML criterion at convergence: 1189.3
##
## Scaled residuals:
##      Min       1Q   Median       3Q      Max
## -2.6486 -0.4229  0.1049  0.5965  1.7438
##
```

```

## Random effects:
##   Groups   Name      Variance Std.Dev.
##   lunaID   (Intercept) 4.669    2.161
##   Residual              4.321    2.079
## Number of obs: 242, groups:  lunaID, 147
##
## Fixed effects:
##               Estimate Std. Error      df t value Pr(>|t|)
## (Intercept)    1.23894    1.13829 238.71502   1.088   0.2775
## age             0.02878    0.04115 185.25798   0.699   0.4852
## absBestError  -0.52656    0.20594 212.91053  -2.557   0.0113 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Correlation of Fixed Effects:
##              (Intr) age
## age          -0.856
## absBestErrr -0.689  0.269

## Linear mixed model fit by REML. t-tests use Satterthwaite's method [
## lmerModLmerTest]
## Formula: pc1 ~ age * absBestError + (1 | lunaID)
##   Data: SNRbehavior %>% filter(measure == "SNR")
##
## REML criterion at convergence: 1194
##
## Scaled residuals:
##      Min       1Q   Median       3Q      Max
## -2.6441 -0.4402  0.1004  0.5979  1.7512
##
## Random effects:
##   Groups   Name      Variance Std.Dev.
##   lunaID   (Intercept) 4.720    2.173
##   Residual              4.319    2.078
## Number of obs: 242, groups:  lunaID, 147
##
## Fixed effects:
##               Estimate Std. Error      df t value Pr(>|t|)
## (Intercept)    0.56935    2.31026 235.03049   0.246   0.806
## age             0.06256    0.10971 237.90106   0.570   0.569
## absBestError  -0.29238    0.73451 230.86767  -0.398   0.691
## age:absBestError -0.01228    0.03706 237.19630  -0.331   0.741
##
## Correlation of Fixed Effects:
##              (Intr) age    absBsE
## age          -0.965
## absBestErrr -0.930  0.918
## ag:bsBstErr  0.870 -0.927 -0.960

## Linear mixed model fit by REML. t-tests use Satterthwaite's method [
## lmerModLmerTest]
## Formula: pc1 ~ age + absBestError + (1 | lunaID)
##   Data: SNRbehavior %>% filter(measure == "Evoked")
##

```



```

## REML criterion at convergence: 1219.1
##
## Scaled residuals:
##      Min       1Q   Median       3Q      Max
## -1.9086 -0.6526 -0.1272  0.4981  2.6559
##
## Random effects:
##   Groups   Name                Variance Std.Dev.
##   lunaID   (Intercept)  3.795      1.948
##   Residual                  5.606      2.368
## Number of obs: 243, groups:  lunaID, 149
##
## Fixed effects:
##              Estimate Std. Error      df t value Pr(>|t|)
## (Intercept)   1.76016   1.20375  234.94235   1.462   0.145
## age          -0.06961   0.04173  180.93779  -1.668   0.097 .
## absBestError -0.24671   0.22635  234.84439  -1.090   0.277
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Correlation of Fixed Effects:
##              (Intr) age
## age          -0.846
## absBestError -0.728  0.298

## Linear mixed model fit by REML. t-tests use Satterthwaite's method [
## lmerModLmerTest]
## Formula: pc1 ~ age * absBestError + (1 | lunaID)
##   Data: SNRbehavior %>% filter(measure == "Evoked")
##
## REML criterion at convergence: 1223.5
##
## Scaled residuals:
##      Min       1Q   Median       3Q      Max
## -1.9023 -0.6403 -0.1434  0.4989  2.6340
##
## Random effects:
##   Groups   Name                Variance Std.Dev.
##   lunaID   (Intercept)  3.781      1.944
##   Residual                  5.640      2.375
## Number of obs: 243, groups:  lunaID, 149
##
## Fixed effects:
##              Estimate Std. Error      df t value Pr(>|t|)
## (Intercept)   2.82579   2.42893  239.00000   1.163   0.246
## age          -0.12423   0.11593  236.82224  -1.072   0.285
## absBestError -0.62019   0.77415  238.36013  -0.801   0.424
## age:absBestError  0.01982   0.03931  238.66174   0.504   0.615
##
## Correlation of Fixed Effects:
##              (Intr) age    absBsE
## age          -0.961
## absBestError -0.936  0.923
## ag:bsBstErr  0.868 -0.933 -0.956

```

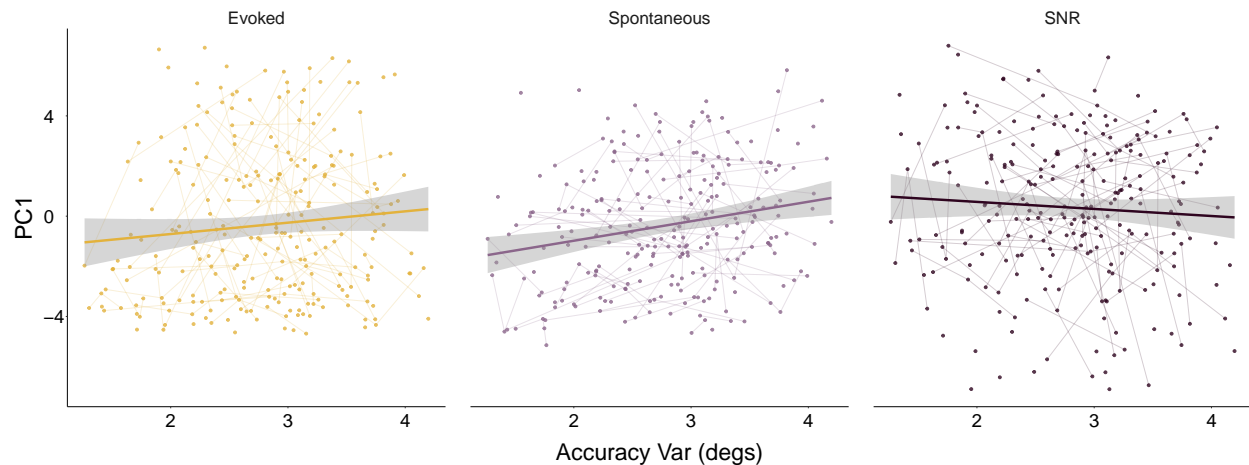
```

## Linear mixed model fit by REML. t-tests use Satterthwaite's method [
## lmerModLmerTest]
## Formula: pc1 ~ age + absBestError + (1 | lunaID)
## Data: SNRbehavior %>% filter(measure == "Spontaneous")
##
## REML criterion at convergence: 1061.2
##
## Scaled residuals:
##      Min       1Q   Median       3Q      Max
## -3.0841 -0.5270 -0.1178  0.4352  2.6888
##
## Random effects:
## Groups Name Variance Std.Dev.
## lunaID (Intercept) 2.794 1.672
## Residual 2.149 1.466
## Number of obs: 247, groups: lunaID, 151
##
## Fixed effects:
## Estimate Std. Error df t value Pr(>|t|)
## (Intercept) 2.26944 0.81397 243.92483 2.788 0.00572 **
## age -0.15799 0.02994 196.77982 -5.277 3.45e-07 ***
## absBestError 0.20605 0.14637 213.93644 1.408 0.16065
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Correlation of Fixed Effects:
## (Intr) age
## age -0.852
## absBestError -0.667 0.235

## Linear mixed model fit by REML. t-tests use Satterthwaite's method [
## lmerModLmerTest]
## Formula: pc1 ~ age * absBestError + (1 | lunaID)
## Data: SNRbehavior %>% filter(measure == "Spontaneous")
##
## REML criterion at convergence: 1066.6
##
## Scaled residuals:
##      Min       1Q   Median       3Q      Max
## -3.0833 -0.5196 -0.1190  0.4366  2.6742
##
## Random effects:
## Groups Name Variance Std.Dev.
## lunaID (Intercept) 2.813 1.677
## Residual 2.153 1.467
## Number of obs: 247, groups: lunaID, 151
##
## Fixed effects:
## Estimate Std. Error df t value Pr(>|t|)
## (Intercept) 2.665781 1.662827 236.458413 1.603 0.1102
## age -0.177854 0.078613 242.439754 -2.262 0.0246 *
## absBestError 0.068902 0.522206 228.880632 0.132 0.8951
## age:absBestError 0.007127 0.026045 238.082540 0.274 0.7846
## ---

```

```
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Correlation of Fixed Effects:
##           (Intr) age    absBsE
## age        -0.965
## absBestErrr -0.928  0.912
## ag:bsBstErr  0.871 -0.924 -0.960
```



```
## Linear mixed model fit by REML. t-tests use Satterthwaite's method [
## lmerModLmerTest]
## Formula: pc1 ~ age + absBestError_sd + (1 | lunaID)
## Data: SNRbehavior %>% filter(measure == "SNR")
##
## REML criterion at convergence: 1199.9
##
## Scaled residuals:
##      Min       1Q   Median       3Q      Max
## -2.64666 -0.44676  0.07474  0.64116  1.66456
##
## Random effects:
##  Groups   Name                Variance Std.Dev.
##  lunaID   (Intercept)  4.491      2.119
##  Residual                    4.449      2.109
## Number of obs: 244, groups:  lunaID, 149
##
## Fixed effects:
##              Estimate Std. Error    df t value Pr(>|t|)
## (Intercept)    0.31237    1.28983 240.29795   0.242   0.809
## age             0.04044    0.04075 177.09320   0.992   0.322
## absBestError_sd -0.28664    0.28256 225.75199  -1.014   0.311
##
## Correlation of Fixed Effects:
##              (Intr) age
```

```

## age          -0.791
## absBstErrr_ -0.779  0.271

## Linear mixed model fit by REML. t-tests use Satterthwaite's method [
## lmerModLmerTest]
## Formula: pc1 ~ age * absBestError_sd + (1 | lunaID)
## Data: SNRbehavior %>% filter(measure == "SNR")
##
## REML criterion at convergence: 1203.8
##
## Scaled residuals:
##      Min       1Q   Median       3Q      Max
## -2.64181 -0.46522  0.07631  0.64134  1.66824
##
## Random effects:
## Groups Name Variance Std.Dev.
## lunaID (Intercept) 4.497  2.121
## Residual 4.467  2.113
## Number of obs: 244, groups: lunaID, 149
##
## Fixed effects:
##              Estimate Std. Error    df t value Pr(>|t|)
## (Intercept)   -1.11893   3.15055 239.37909  -0.355    0.723
## age            0.11221   0.14976 239.04939   0.749    0.454
## absBestError_sd 0.20748   1.03146 237.77849   0.201    0.841
## age:absBestError_sd -0.02537   0.05094 239.96080  -0.498    0.619
##
## Correlation of Fixed Effects:
##              (Intr) age    absBE_
## age          -0.966
## absBstErrr_ -0.965  0.946
## ag:bsBstEr_  0.912 -0.962 -0.962

## Linear mixed model fit by REML. t-tests use Satterthwaite's method [
## lmerModLmerTest]
## Formula: pc1 ~ age + absBestError_sd + (1 | lunaID)
## Data: SNRbehavior %>% filter(measure == "Evoked")
##
## REML criterion at convergence: 1233.2
##
## Scaled residuals:
##      Min       1Q   Median       3Q      Max
## -1.7779 -0.6203 -0.1382  0.4971  2.4790
##
## Random effects:
## Groups Name Variance Std.Dev.
## lunaID (Intercept) 3.669  1.915
## Residual 5.676  2.382
## Number of obs: 246, groups: lunaID, 151
##
## Fixed effects:
##              Estimate Std. Error    df t value Pr(>|t|)
## (Intercept)   0.08456   1.34562 236.25470   0.063    0.950
## age          -0.05355   0.04106 171.07169  -1.304    0.194

```

```

## absBestError_sd    0.22630    0.30473 241.36142    0.743    0.458
##
## Correlation of Fixed Effects:
##          (Intr) age
## age          -0.776
## absBstErrr_ -0.798  0.275

## Linear mixed model fit by REML. t-tests use Satterthwaite's method [
## lmerModLmerTest]
## Formula: pc1 ~ age * absBestError_sd + (1 | lunaID)
## Data: SNRbehavior %>% filter(measure == "Evoked")
##
## REML criterion at convergence: 1237.2
##
## Scaled residuals:
##      Min       1Q   Median       3Q      Max
## -1.7770 -0.6210 -0.1341  0.5091  2.4756
##
## Random effects:
## Groups   Name            Variance Std.Dev.
## lunaID   (Intercept)  3.697      1.923
## Residual                5.689      2.385
## Number of obs: 246, groups: lunaID, 151
##
## Fixed effects:
##              Estimate Std. Error    df t value Pr(>|t|)
## (Intercept)    0.70457    3.28884 240.43868   0.214    0.831
## age            -0.08485    0.15692 233.08572  -0.541    0.589
## absBestError_sd  0.01051    1.08671 241.41826   0.010    0.992
## age:absBestError_sd 0.01113    0.05380 235.79654   0.207    0.836
##
## Correlation of Fixed Effects:
##          (Intr) age    absBE_
## age          -0.964
## absBstErrr_ -0.967  0.946
## ag:bsBstEr_  0.912 -0.965 -0.960

## Linear mixed model fit by REML. t-tests use Satterthwaite's method [
## lmerModLmerTest]
## Formula: pc1 ~ age + absBestError_sd + (1 | lunaID)
## Data: SNRbehavior %>% filter(measure == "Spontaneous")
##
## REML criterion at convergence: 1067.2
##
## Scaled residuals:
##      Min       1Q   Median       3Q      Max
## -3.0859 -0.5319 -0.1097  0.4697  2.6374
##
## Random effects:
## Groups   Name            Variance Std.Dev.
## lunaID   (Intercept)  2.73      1.652
## Residual                2.15      1.466
## Number of obs: 249, groups: lunaID, 153
##

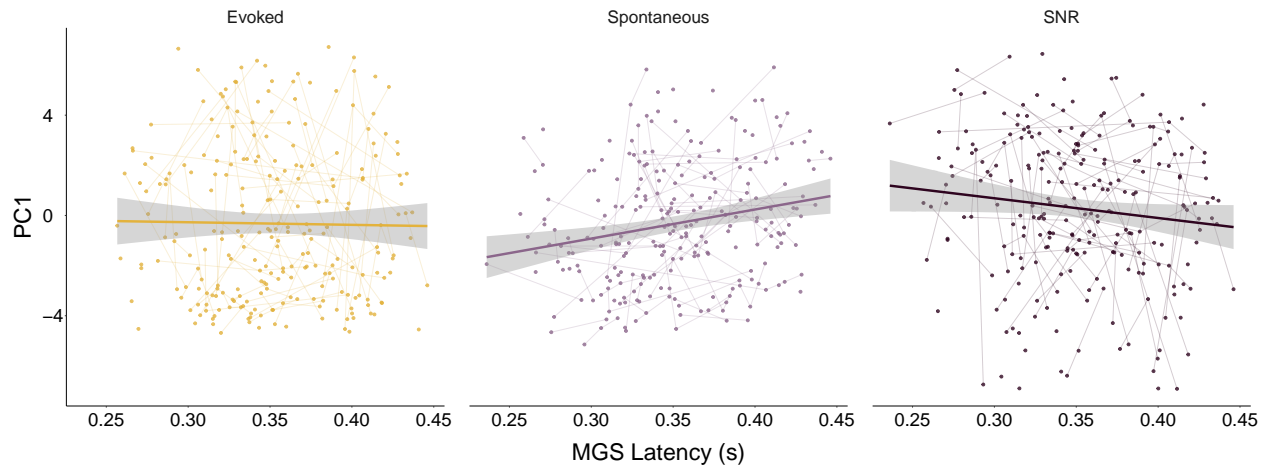
```

```

## Fixed effects:
##           Estimate Std. Error      df t value Pr(>|t|)
## (Intercept)    1.98514    0.92329 245.90156   2.150   0.0325 *
## age           -0.15599    0.02967 191.06586  -5.258 3.88e-07 ***
## absBestError_sd  0.30118    0.20203 226.71130   1.491   0.1374
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Correlation of Fixed Effects:
##           (Intr) age
## age          -0.786
## absBstErrr_ -0.765  0.245

## Linear mixed model fit by REML. t-tests use Satterthwaite's method [
## lmerModLmerTest]
## Formula: pc1 ~ age * absBestError_sd + (1 | lunaID)
## Data: SNRbehavior %>% filter(measure == "Spontaneous")
##
## REML criterion at convergence: 1071.6
##
## Scaled residuals:
##      Min       1Q   Median       3Q      Max
## -3.0788 -0.5183 -0.1084  0.4679  2.6121
##
## Random effects:
## Groups Name Variance Std.Dev.
## lunaID (Intercept) 2.737  1.655
## Residual          2.155  1.468
## Number of obs: 249, groups: lunaID, 153
##
## Fixed effects:
##           Estimate Std. Error      df t value Pr(>|t|)
## (Intercept)    3.19207    2.28903 243.06215   1.395   0.1644
## age           -0.21644    0.10901 244.98752  -1.986   0.0482 *
## absBestError_sd -0.11545    0.75063 240.90391  -0.154   0.8779
## age:absBestError_sd  0.02134    0.03703 244.63640   0.576   0.5649
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Correlation of Fixed Effects:
##           (Intr) age    absBE_
## age          -0.967
## absBstErrr_ -0.964  0.945
## ag:bsBstEr_  0.915 -0.962 -0.963

```



```
## Linear mixed model fit by REML. t-tests use Satterthwaite's method [
## lmerModLmerTest]
## Formula: pc1 ~ age + mgsLatency_sd + (1 | lunaID)
## Data: SNRbehavior %>% filter(measure == "Evoked")
##
## REML criterion at convergence: 1232.1
##
## Scaled residuals:
##      Min       1Q   Median       3Q      Max
## -1.8208 -0.6270 -0.1503  0.5211  2.4778
##
## Random effects:
## Groups Name Variance Std.Dev.
## lunaID (Intercept) 3.584 1.893
## Residual 5.742 2.396
## Number of obs: 247, groups: lunaID, 151
##
## Fixed effects:
## Estimate Std. Error df t value Pr(>|t|)
## (Intercept) 2.34312 1.44238 210.69024 1.624 0.1058
## age -0.08252 0.04329 171.62516 -1.906 0.0583 .
## mgsLatency_sd -9.29830 7.78418 234.95915 -1.195 0.2335
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Correlation of Fixed Effects:
## (Intr) age
## age -0.842
## mgsLtncy_sd -0.827 0.426

## Linear mixed model fit by REML. t-tests use Satterthwaite's method [
## lmerModLmerTest]
## Formula: mgsLatency_sd ~ age + pc1 + (1 | lunaID)
```

```

## Data: SNRbehavior %>% filter(measure == "Evoked")
##
## REML criterion at convergence: -1108
##
## Scaled residuals:
##      Min       1Q   Median       3Q      Max
## -2.10374 -0.53372 -0.00072  0.52123  2.39874
##
## Random effects:
##   Groups   Name      Variance Std.Dev.
##   lunaID   (Intercept) 0.0003869 0.01967
##   Residual                0.0002899 0.01703
## Number of obs: 247, groups: lunaID, 151
##
## Fixed effects:
##              Estimate Std. Error      df t value Pr(>|t|)
## (Intercept)  1.542e-01  7.110e-03 1.709e+02  21.689 < 2e-16 ***
## age          -2.423e-03  3.425e-04 1.767e+02  -7.075 3.37e-11 ***
## pc1          -8.265e-04  5.107e-04 2.321e+02  -1.618  0.107
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Correlation of Fixed Effects:
##      (Intr) age
## age -0.960
## pc1 -0.063  0.087

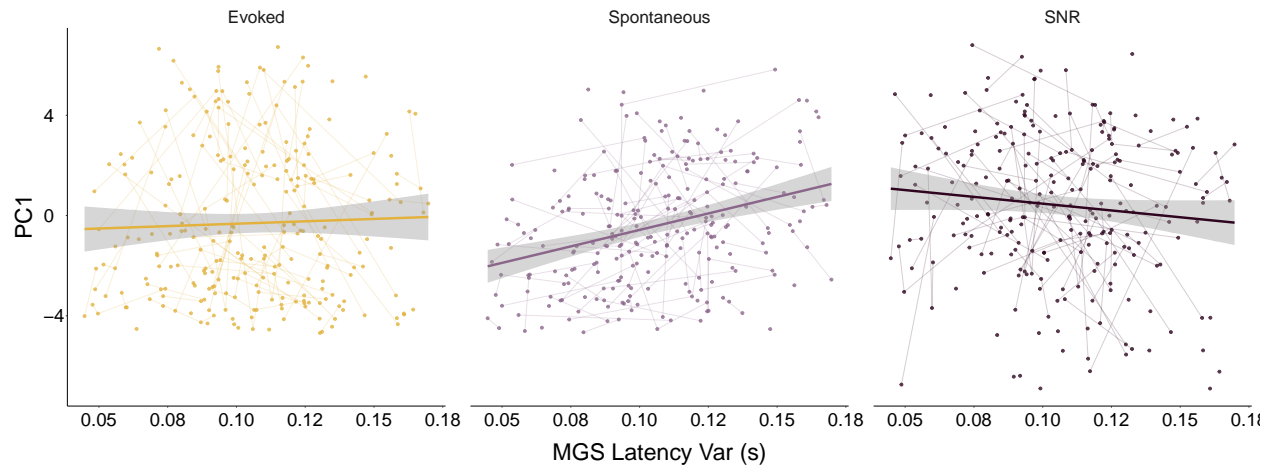
## [1] 0.069

## Linear mixed model fit by REML. t-tests use Satterthwaite's method [
## lmerModLmerTest]
## Formula: pc1 ~ age * mgsLatency_sd + (1 | lunaID)
## Data: SNRbehavior %>% filter(measure == "Evoked")
##
## REML criterion at convergence: 1229.6
##
## Scaled residuals:
##      Min       1Q   Median       3Q      Max
## -1.8255 -0.6407 -0.1626  0.5150  2.4713
##
## Random effects:
##   Groups   Name      Variance Std.Dev.
##   lunaID   (Intercept) 3.606    1.899
##   Residual                5.755    2.399
## Number of obs: 247, groups: lunaID, 151
##
## Fixed effects:
##              Estimate Std. Error      df t value Pr(>|t|)
## (Intercept)    3.5096     3.1161 203.7998   1.126   0.261
## age            -0.1401     0.1431 202.6142  -0.979   0.329
## mgsLatency_sd -19.7314    25.9021 211.3408  -0.762   0.447
## age:mgsLatency_sd  0.5327     1.2631 211.5190   0.422   0.674
##
## Correlation of Fixed Effects:

```



```
##          (Intr) age    mgsLt_
## age      -0.963
## mgsLtncy_sd -0.960  0.948
## ag:mgsLtnc_  0.886 -0.953 -0.954
```



```
## Linear mixed model fit by REML. t-tests use Satterthwaite's method [
## lmerModLmerTest]
## Formula: pc1 ~ age + mgsLatency_sd + (1 | lunaID)
## Data: SNRbehavior %>% filter(measure == "SNR")
##
## REML criterion at convergence: 1199.8
##
## Scaled residuals:
##      Min       1Q   Median       3Q      Max
## -2.53785 -0.46162  0.06627  0.59848  2.02924
##
## Random effects:
##  Groups   Name                Variance Std.Dev.
##  lunaID   (Intercept)  4.497      2.121
##  Residual                    4.355      2.087
## Number of obs: 246, groups:  lunaID, 149
##
## Fixed effects:
##              Estimate Std. Error      df t value Pr(>|t|)
## (Intercept)   2.034314   1.390675 230.125054   1.463   0.1449
## age            0.004965   0.042748 183.312301   0.116   0.9077
## mgsLatency_sd -16.340456   7.332821 242.998664  -2.228   0.0268 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Correlation of Fixed Effects:
##              (Intr) age
## age          -0.846
```

```
## mgsLtncy_sd -0.813  0.414

## Linear mixed model fit by REML. t-tests use Satterthwaite's method [
## lmerModLmerTest]
## Formula: pc1 ~ age * mgsLatency_sd + (1 | lunaID)
## Data: SNRbehavior %>% filter(measure == "Spontaneous")
##
## REML criterion at convergence: 1057.5
##
## Scaled residuals:
##      Min       1Q   Median       3Q      Max
## -2.89738 -0.48293 -0.06393  0.47469  2.37557
##
## Random effects:
## Groups Name Variance Std.Dev.
## lunaID (Intercept) 2.630  1.622
## Residual 2.077  1.441
## Number of obs: 251, groups: lunaID, 153
##
## Fixed effects:
##              Estimate Std. Error      df t value Pr(>|t|)
## (Intercept)    2.7547    2.2004 233.7786   1.252   0.2119
## age           -0.2311    0.1005 233.0159  -2.299   0.0224 *
## mgsLatency_sd -3.8302   18.0746 239.3699  -0.212   0.8324
## age:mgsLatency_sd  0.9352    0.8711 240.9693   1.074   0.2841
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Correlation of Fixed Effects:
##              (Intr) age    mgsLt_
## age           -0.966
## mgsLtncy_sd -0.960  0.946
## ag:mgsLtnc_  0.895 -0.953 -0.958
```

Behavior Loops