Hippocampal subfield

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Contents

Methods

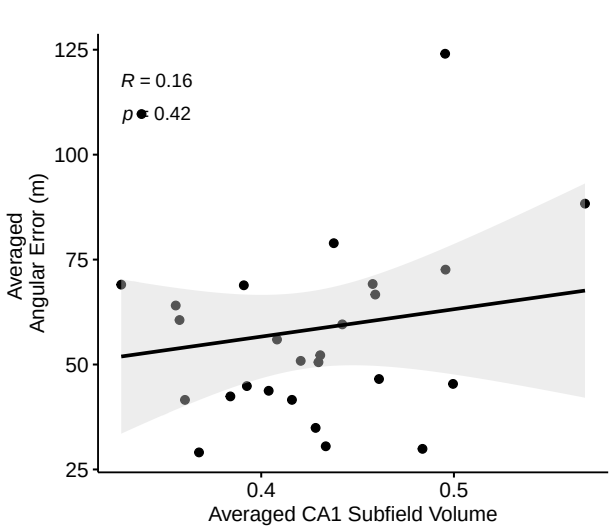
Results

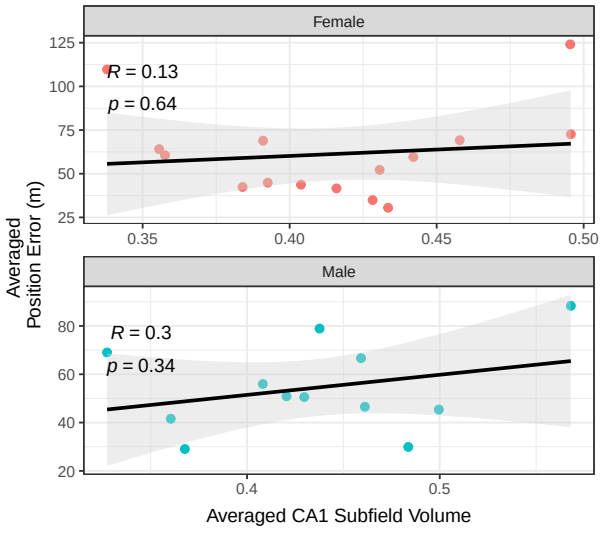
Angular Error

Average

Total N= 27 F=16 M=11

CA1 There were no significant associations between CA1 and average angular error across men and women. (Correlations are not controlled by sex.) All linear regressions run with a pearson

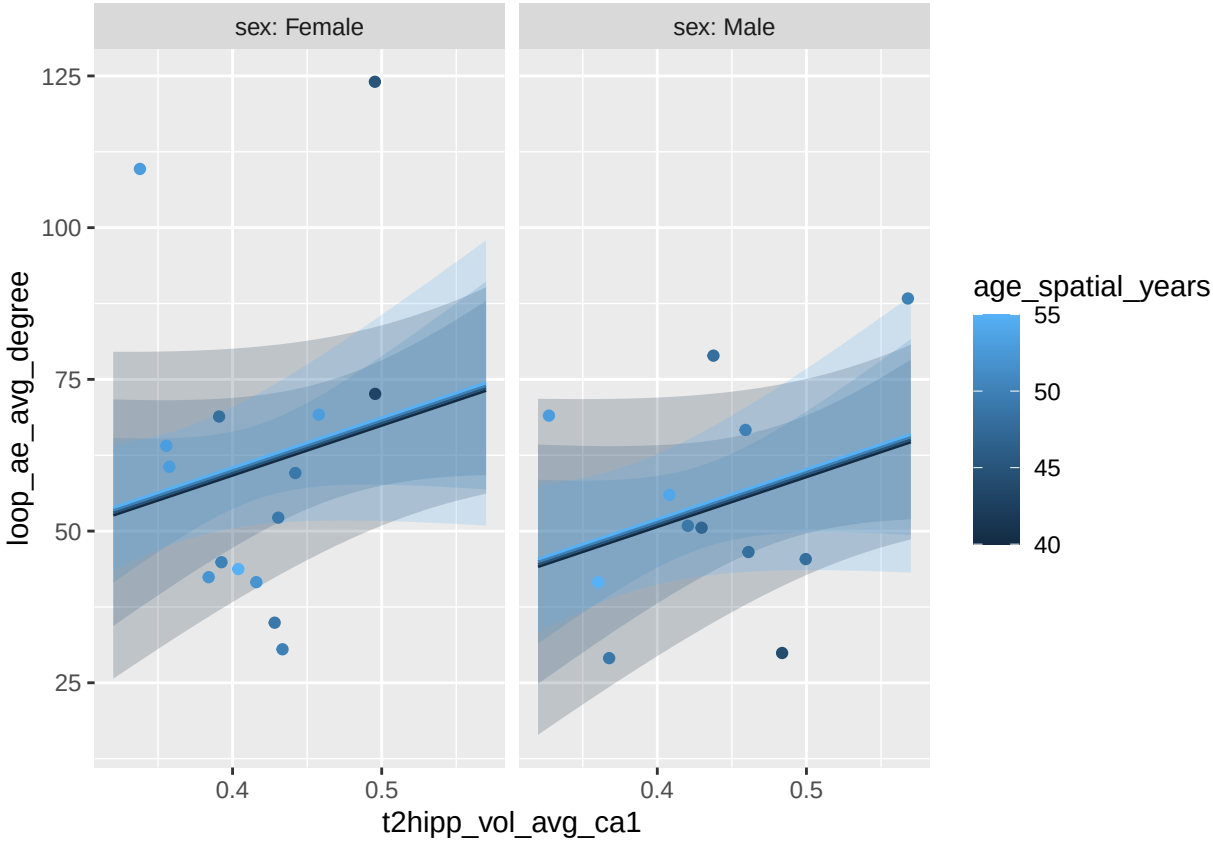




Running multiple linear regressions to see the effect of age and sex and then plotting results

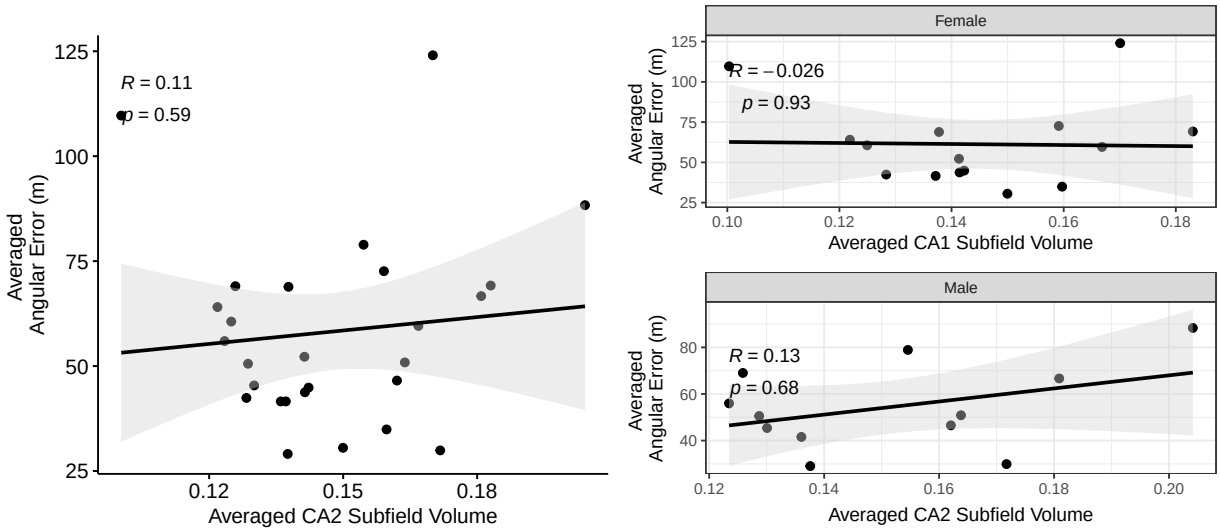
```
##
## Call:
```

```
## lm(formula = loop_ae_avg_degree ~ t2hipp_vol_avg_ca1 + age_spatial_years +
##     sex, data = df)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -32.249 -15.502  -3.172   8.604  56.596
##
## Coefficients:
##                     Estimate Std. Error t value Pr(>|t|)
## (Intercept)         22.94464  124.46691   0.184    0.855
## t2hipp_vol_avg_ca1  82.20637  105.06111   0.782    0.442
## age_spatial_years    0.08383    1.85054   0.045    0.964
## sexMale             -8.48312    9.28906  -0.913    0.371
##
## Residual standard error: 23.57 on 23 degrees of freedom
##   (1 observation deleted due to missingness)
## Multiple R-squared:  0.05989,    Adjusted R-squared:  -0.06273
## F-statistic: 0.4884 on 3 and 23 DF,  p-value: 0.6937
```



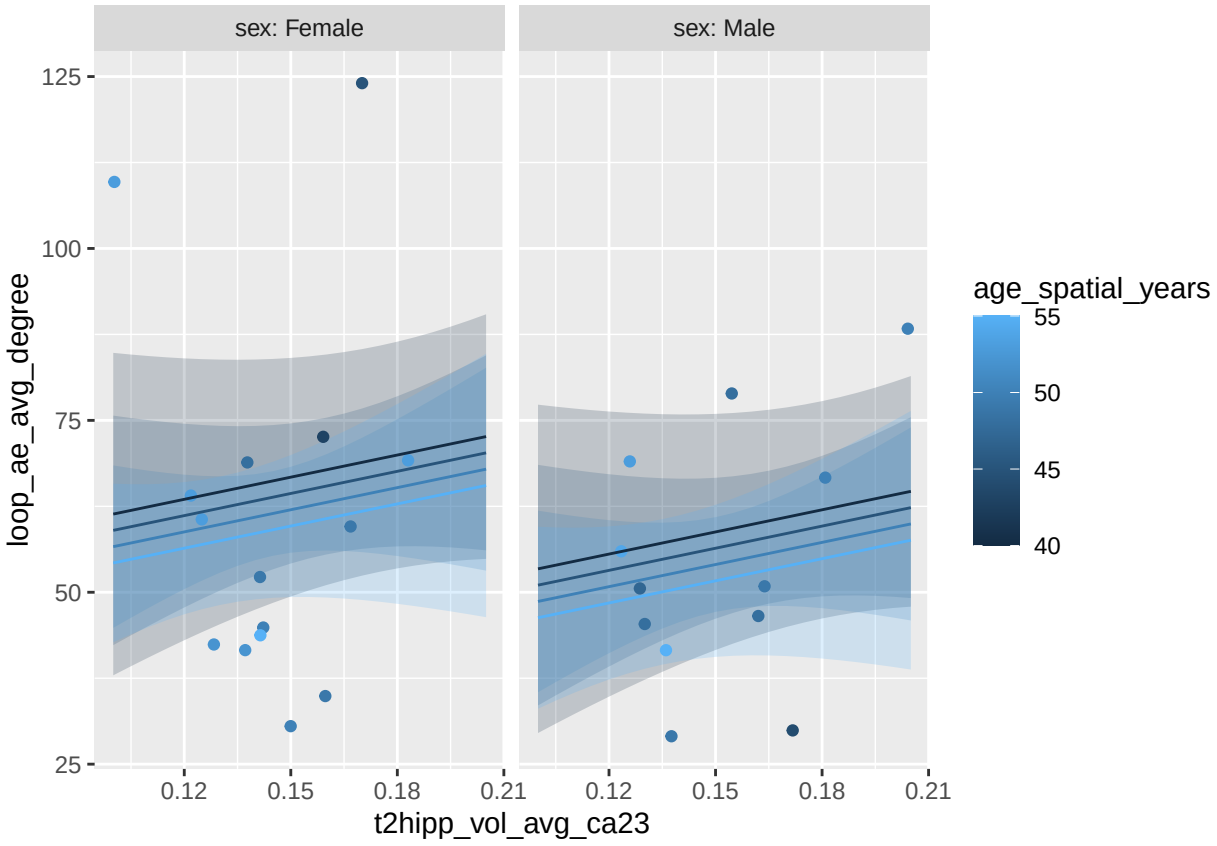
CA2/3

There were no significant associations between CA2/3 and average angular error across men and women. The lm was run using a pearson. When conducting the sex stratification, men were analyzed using a spearman and women with a pearson

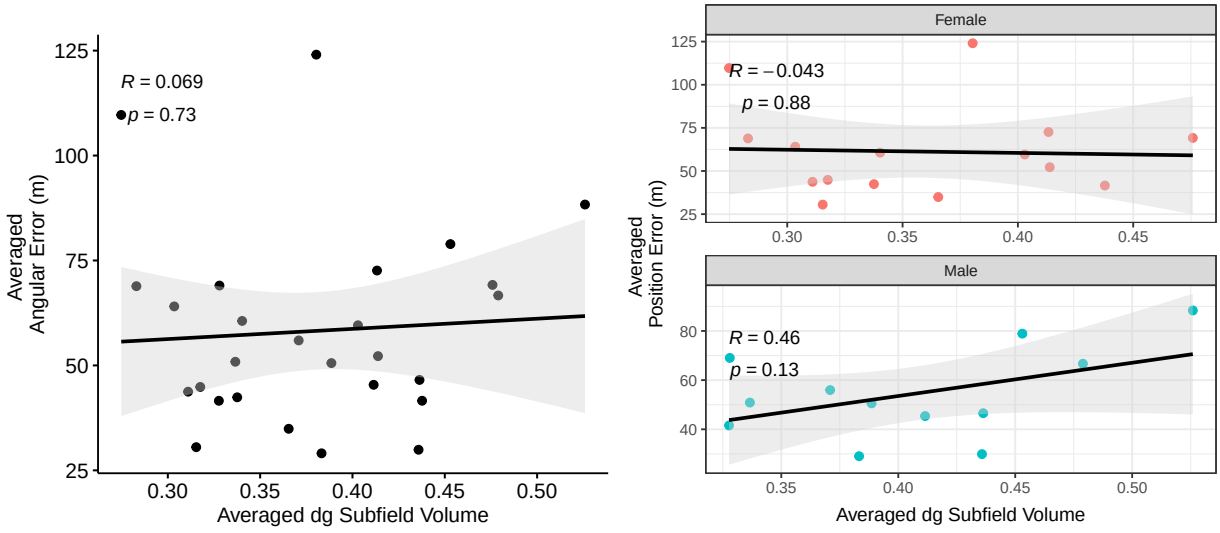


Running multiple linear regressions to see the effect of age and sex and then plotting results

```
##
## Call:
## lm(formula = loop_ae_avg_degree ~ t2hipp_vol_avg_ca23 + age_spatial_years +
##     sex, data = df)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -31.471 -15.632  -4.712   6.959  57.519
##
## Coefficients:
##                     Estimate Std. Error t value Pr(>|t|)
## (Intercept)          69.5909    99.6115   0.699    0.492
## t2hipp_vol_avg_ca23 107.3413   223.8324   0.480    0.636
## age_spatial_years    -0.4739     1.6271  -0.291    0.773
## sexMale              -7.9649     9.3353  -0.853    0.402
##
## Residual standard error: 23.77 on 23 degrees of freedom
##   (1 observation deleted due to missingness)
## Multiple R-squared:  0.04442,    Adjusted R-squared:  -0.08022
## F-statistic: 0.3564 on 3 and 23 DF,  p-value: 0.785
```

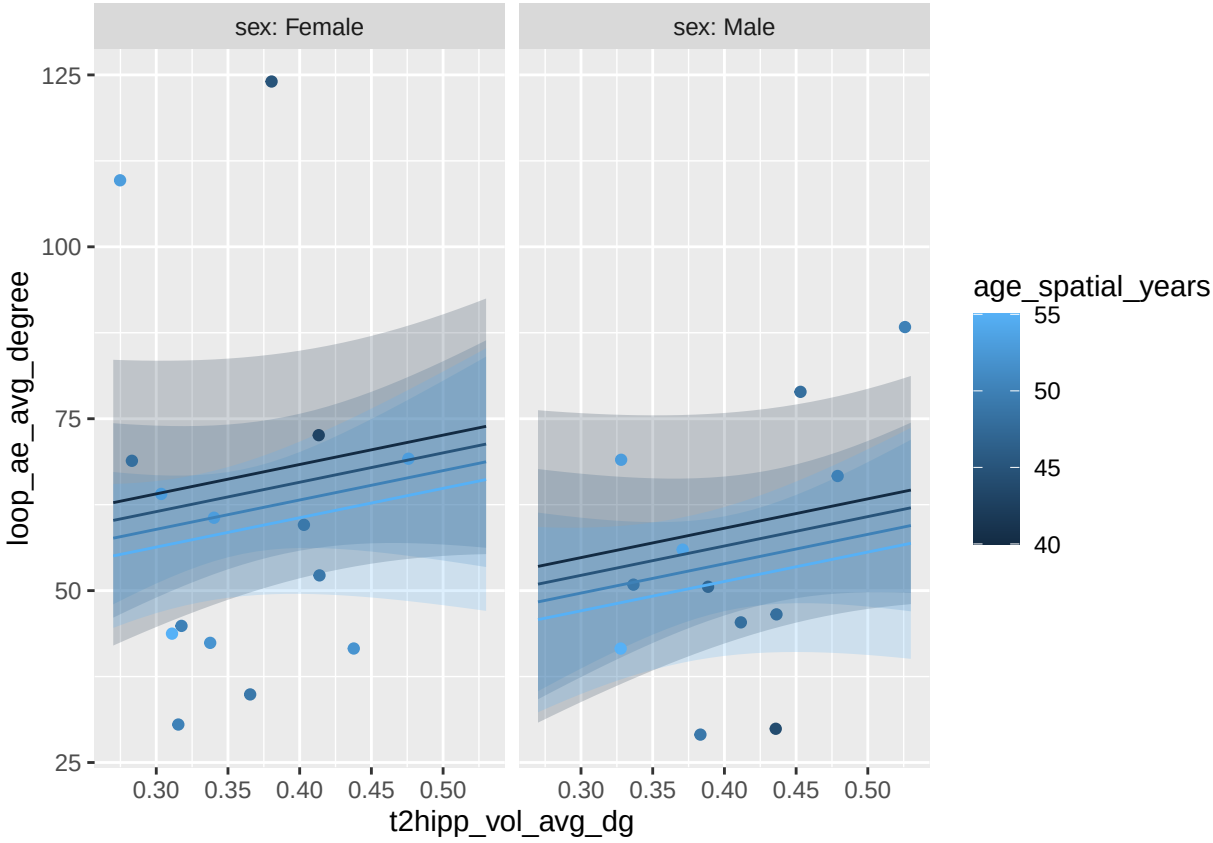


DG

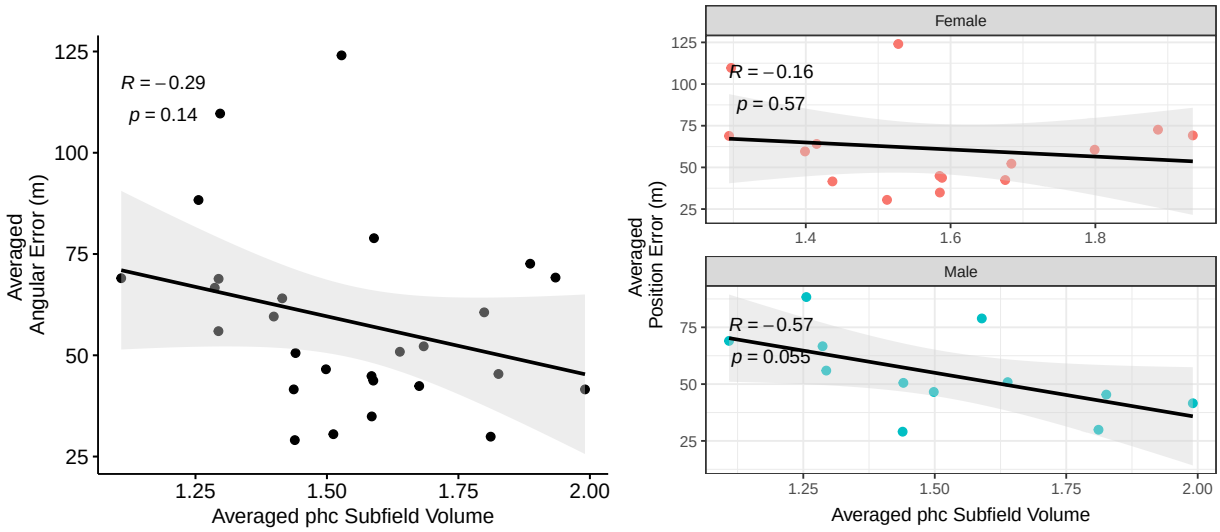


Running multiple linear regressions to see the effect of age and sex and then plotting results

```
##
## Call:
## lm(formula = loop_ae_avg_degree ~ t2hipp_vol_avg_dg + age_spatial_years +
##     sex, data = df)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -29.044 -13.924  -4.257   7.967  59.117
##
## Coefficients:
##                   Estimate Std. Error t value Pr(>|t|)
## (Intercept)        71.9035    93.6438   0.768    0.450
## t2hipp_vol_avg_dg  42.7105    82.3755   0.518    0.609
## age_spatial_years  -0.5161     1.5770  -0.327    0.746
## sexMale            -9.2691     9.9309  -0.933    0.360
##
## Residual standard error: 23.75 on 23 degrees of freedom
##   (1 observation deleted due to missingness)
## Multiple R-squared:  0.04601,    Adjusted R-squared:  -0.07842
## F-statistic: 0.3698 on 3 and 23 DF,  p-value: 0.7755
```

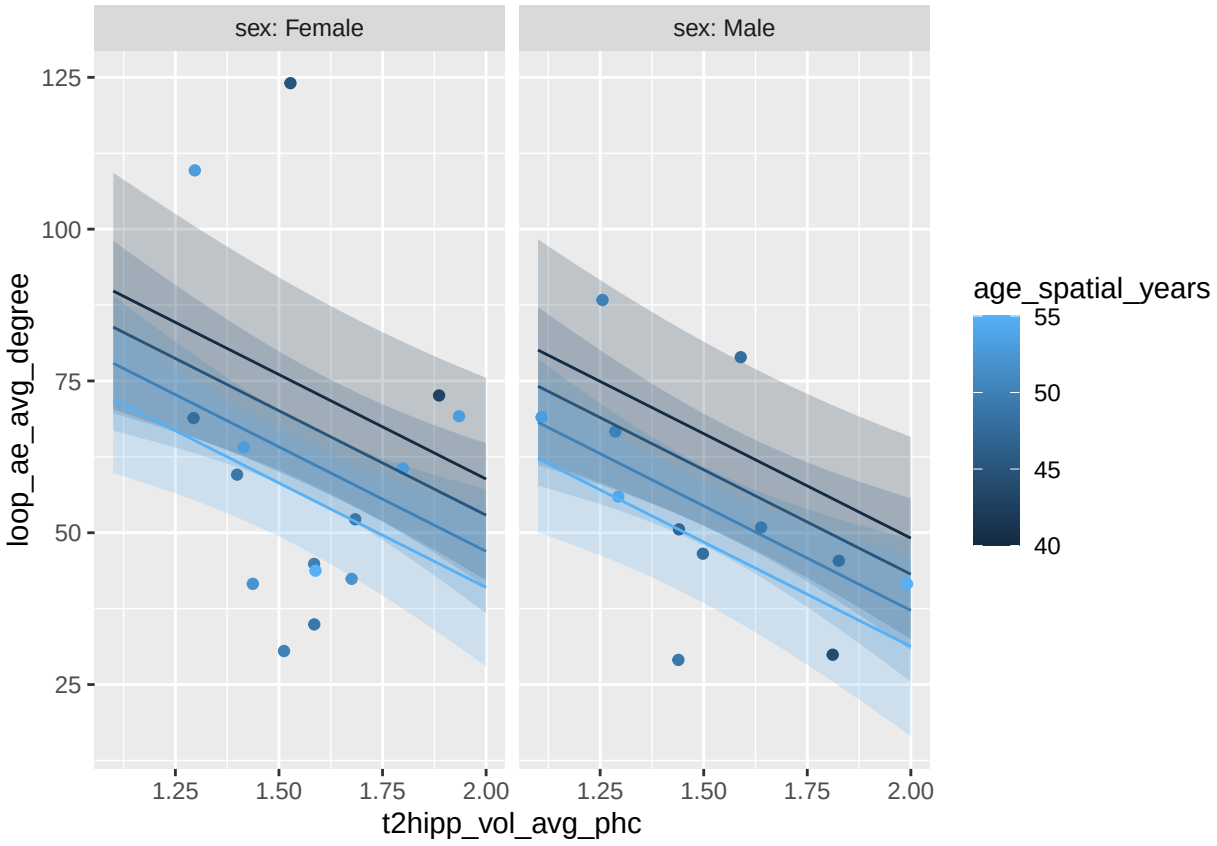


PHC

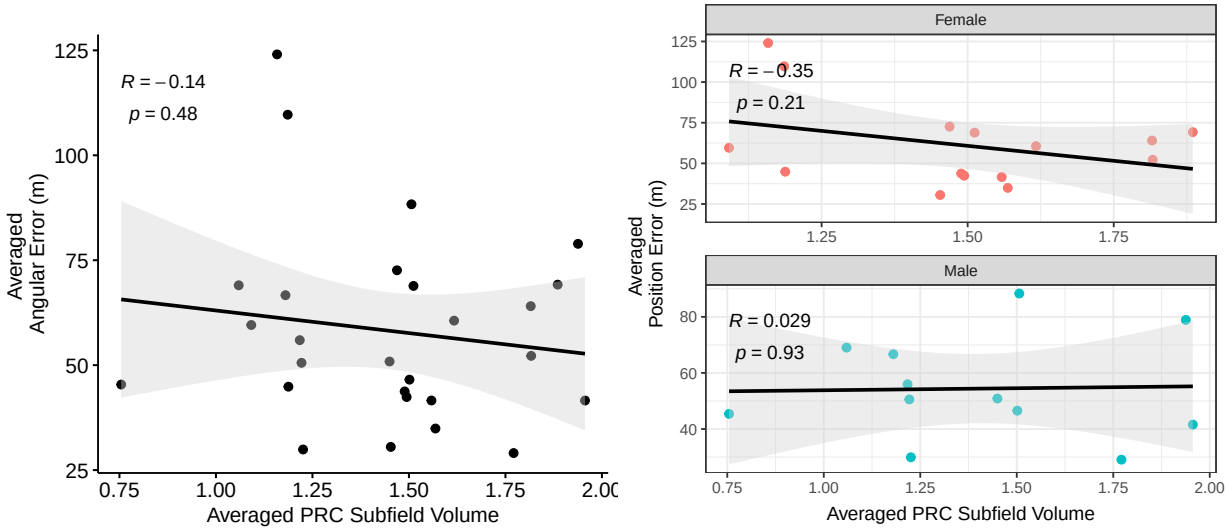


Running multiple linear regressions to see the effect of age and sex and then plotting results

```
##
## Call:
## lm(formula = loop_ae_avg_degree ~ t2hipp_vol_avg_phc + age_spatial_years +
##     sex, data = df)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -33.200 -12.366  -0.796  10.158  54.904
##
## Coefficients:
##                    Estimate Std. Error t value Pr(>|t|)
## (Intercept)         175.273     82.770   2.118   0.0452 *
## t2hipp_vol_avg_phc  -34.412     19.858  -1.733   0.0965 .
## age_spatial_years    -1.190      1.423  -0.836   0.4115
## sexMale              -9.727      8.855  -1.098   0.2834
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 22.46 on 23 degrees of freedom
##   (1 observation deleted due to missingness)
## Multiple R-squared:  0.1463, Adjusted R-squared:  0.03497
## F-statistic: 1.314 on 3 and 23 DF,  p-value: 0.2939
```

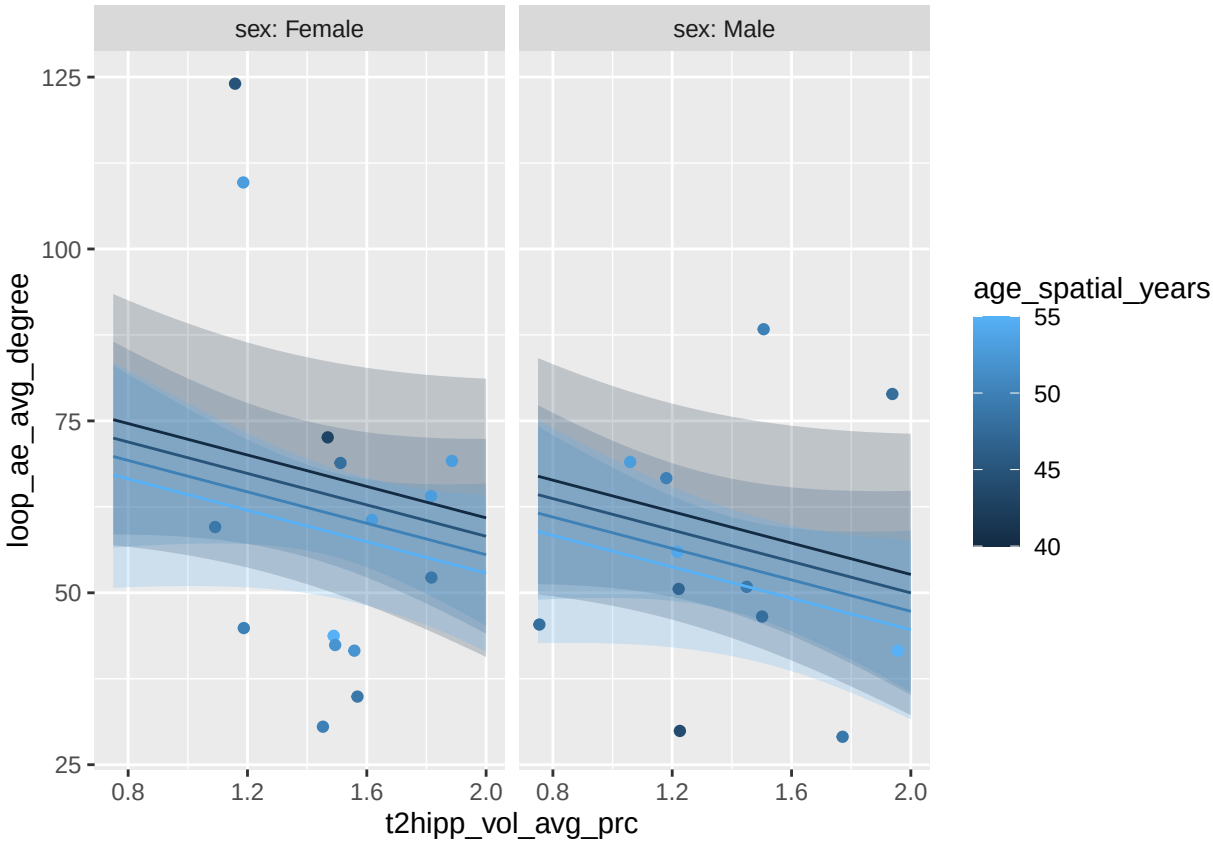

sex: Female
sex: Male
loop_ae_avg_degree
t2hipp_vol_avg_phc
age_spatial_years
55
50
45
40

PRC

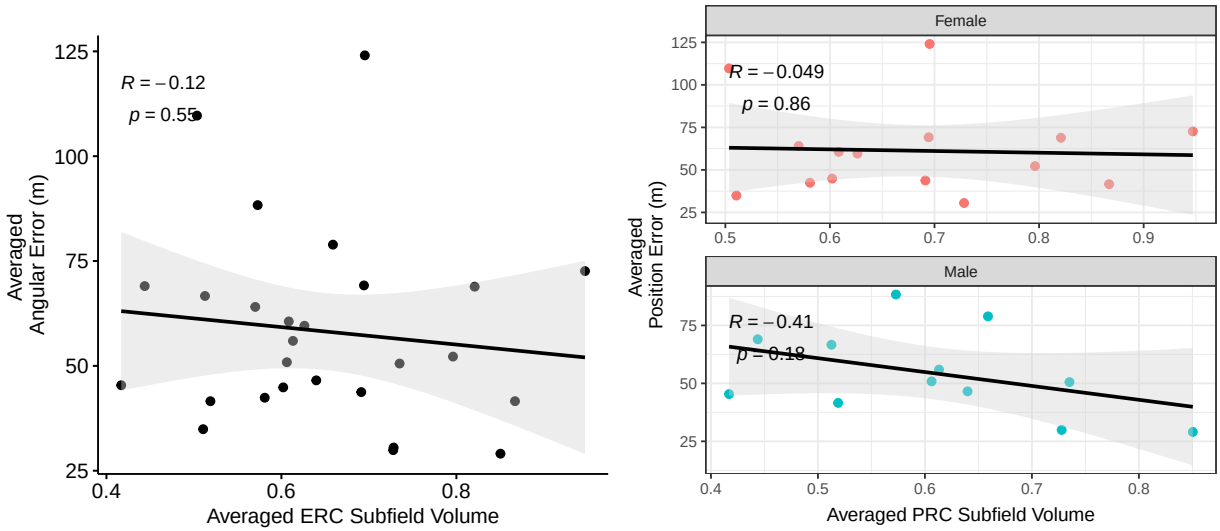

R = −0.14
p = 0.48
Averaged Angular Error (m)
Averaged PRC Subfield Volume
Female
R = −0.35
p = 0.21
Male
R = 0.029
p = 0.93
Averaged Position Error (m)
Averaged PRC Subfield Volume

Running multiple linear regressions to see the effect of age and sex and then plotting results

```
##
## Call:
## lm(formula = loop_ae_avg_degree ~ t2hipp_vol_avg_prc + age_spatial_years +
##     sex, data = df)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -31.264 -17.531  -3.548   9.012  56.209
##
## Coefficients:
##                    Estimate Std. Error t value Pr(>|t|)
## (Intercept)         105.192     74.725   1.408    0.173
## t2hipp_vol_avg_prc  -11.428     16.076  -0.711    0.484
## age_spatial_years    -0.536      1.520  -0.353    0.728
## sexMale              -8.234      9.281  -0.887    0.384
##
## Residual standard error: 23.63 on 23 degrees of freedom
##   (1 observation deleted due to missingness)
## Multiple R-squared:  0.05561,    Adjusted R-squared:  -0.06757
## F-statistic: 0.4515 on 3 and 23 DF,  p-value: 0.7187
```

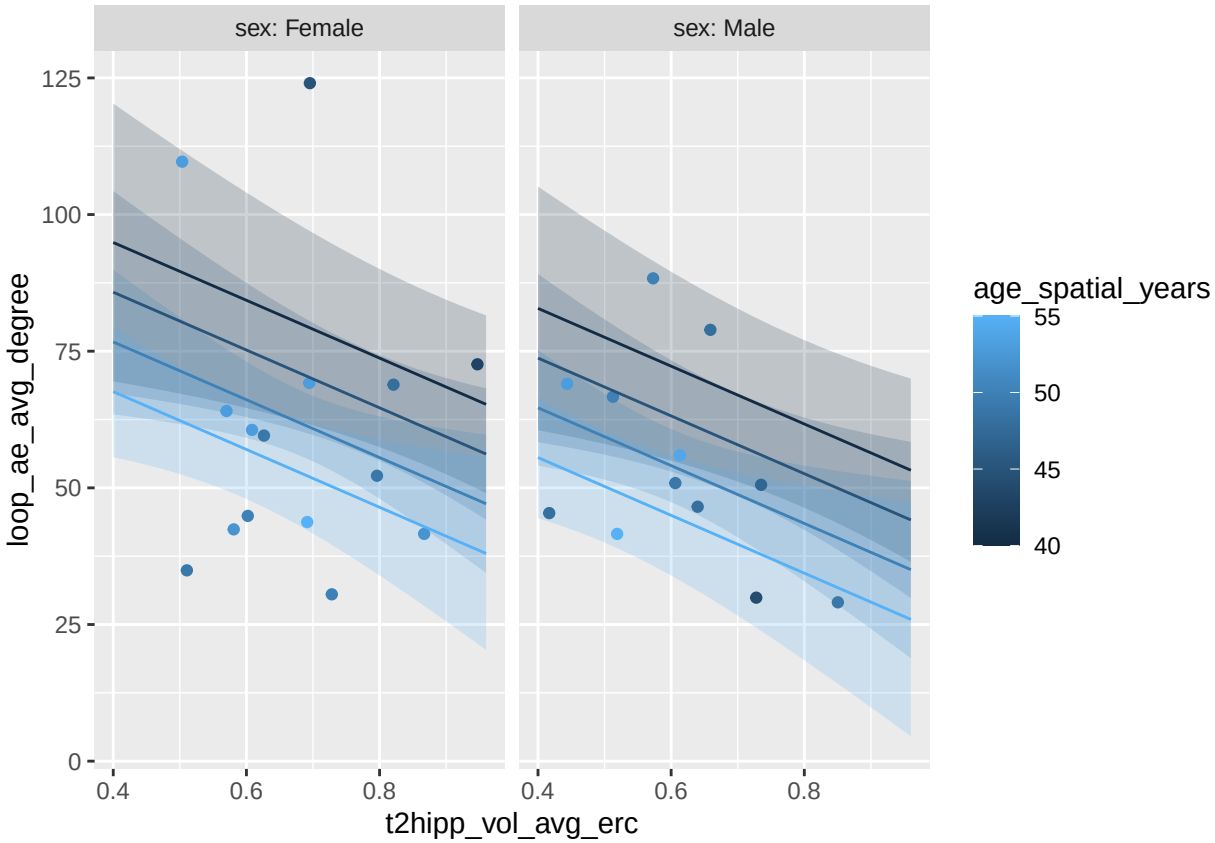


ERC

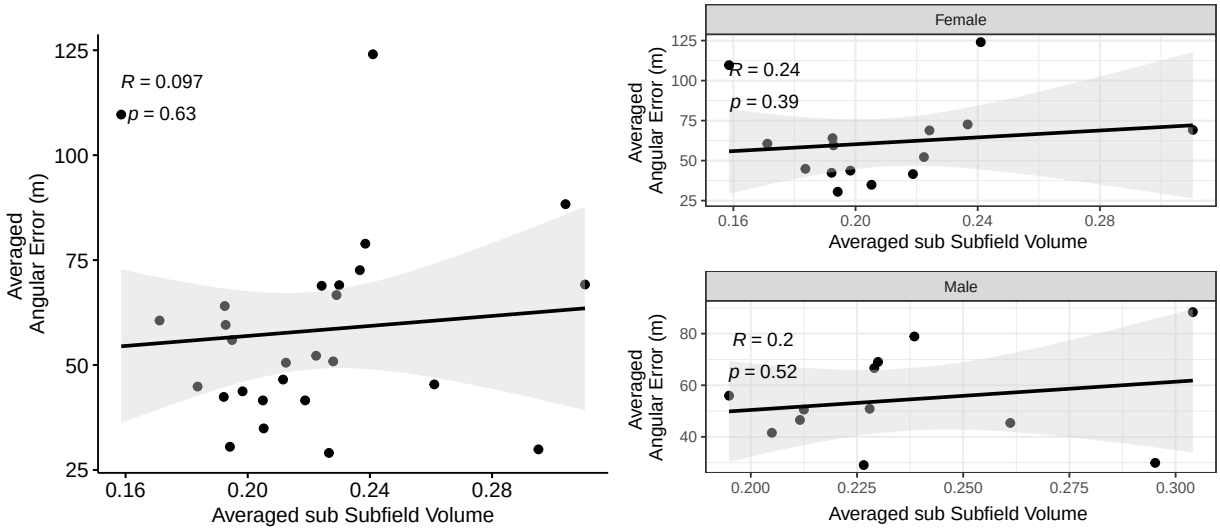


Running multiple linear regressions to see the effect of age and sex and then plotting results

```
##
## Call:
## lm(formula = loop_ae_avg_degree ~ t2hipp_vol_avg_erc + age_spatial_years +
##     sex, data = df)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -37.766 -11.320  -4.685  11.449  53.864
##
## Coefficients:
##                    Estimate Std. Error t value Pr(>|t|)
## (Intercept)         188.816     99.616   1.895   0.0707 .
## t2hipp_vol_avg_erc  -52.875     41.015  -1.289   0.2102
## age_spatial_years    -1.819      1.648  -1.104   0.2809
## sexMale             -12.055      9.686  -1.245   0.2258
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 23.07 on 23 degrees of freedom
##   (1 observation deleted due to missingness)
## Multiple R-squared:  0.0999, Adjusted R-squared:  -0.0175
## F-statistic: 0.8509 on 3 and 23 DF,  p-value: 0.4804
```

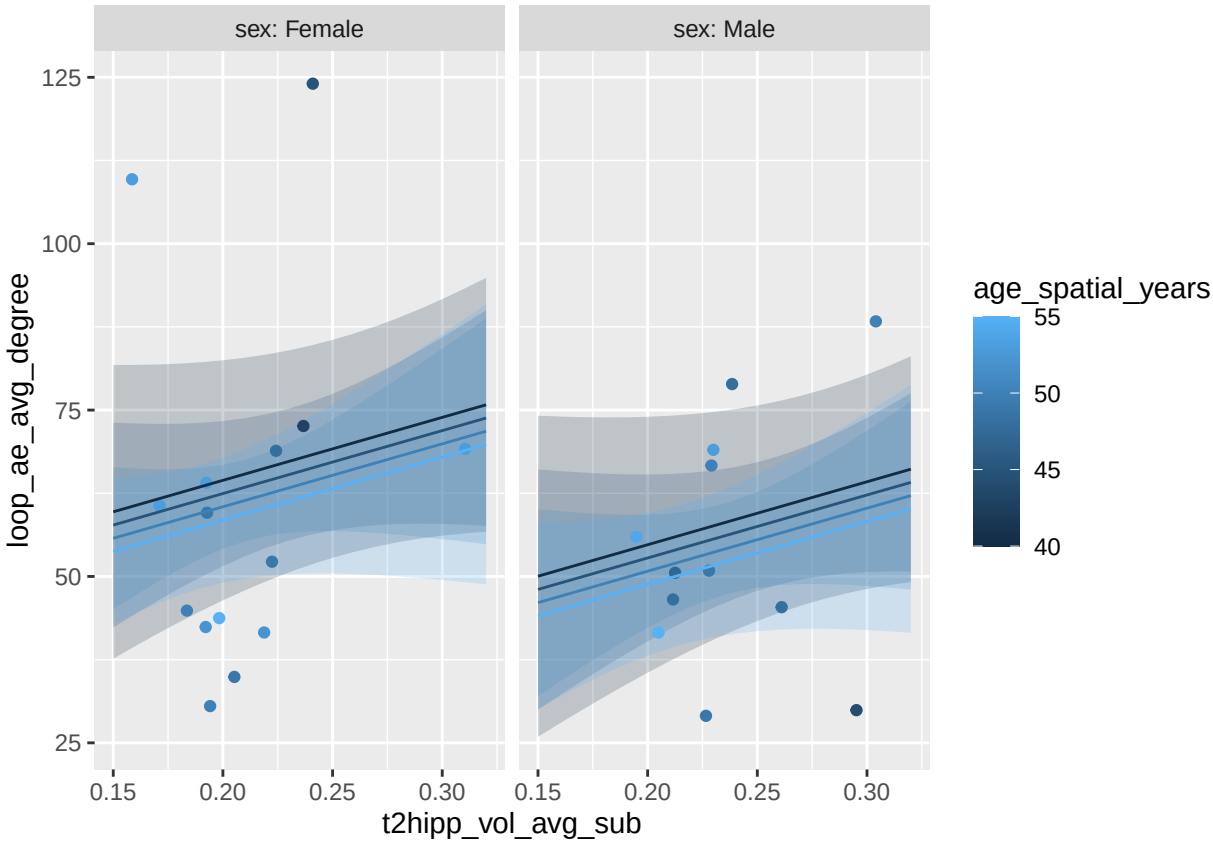

sex: Female
sex: Male
loop_ae_avg_degree
t2hipp_vol_avg_erc
age_spatial_years
55
50
45
40

SUB


R = 0.097
p = 0.63
Averaged Angular Error (m)
Averaged sub Subfield Volume
Female
R = 0.24
p = 0.39
Male
R = 0.2
p = 0.52

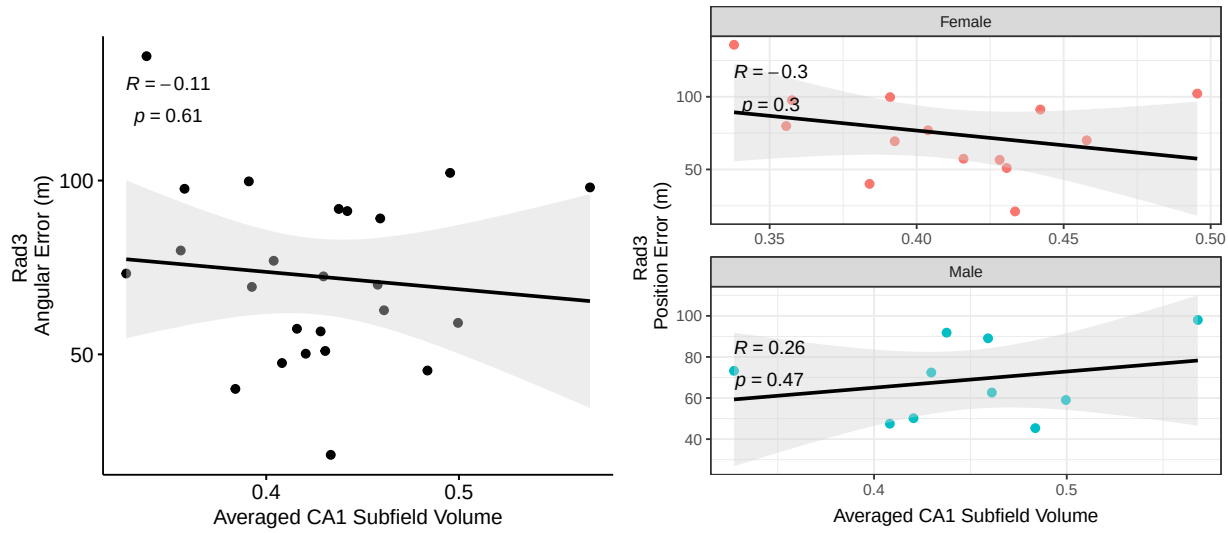
Running multiple linear regressions to see the effect of age and sex and then plotting results

```
##
## Call:
## lm(formula = loop_ae_avg_degree ~ t2hipp_vol_avg_sub + age_spatial_years +
##     sex, data = df)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -32.276 -14.312  -2.614   6.561  57.709
##
## Coefficients:
##                     Estimate Std. Error t value Pr(>|t|)
## (Intercept)          61.4117    96.1615   0.639    0.529
## t2hipp_vol_avg_sub   94.6134   144.7248   0.654    0.520
## age_spatial_years    -0.3973     1.5979  -0.249    0.806
## sexMale              -9.6746     9.8565  -0.982    0.337
##
## Residual standard error: 23.67 on 23 degrees of freedom
##   (1 observation deleted due to missingness)
## Multiple R-squared:  0.05247,    Adjusted R-squared:  -0.07112
## F-statistic: 0.4245 on 3 and 23 DF,  p-value: 0.7372
```



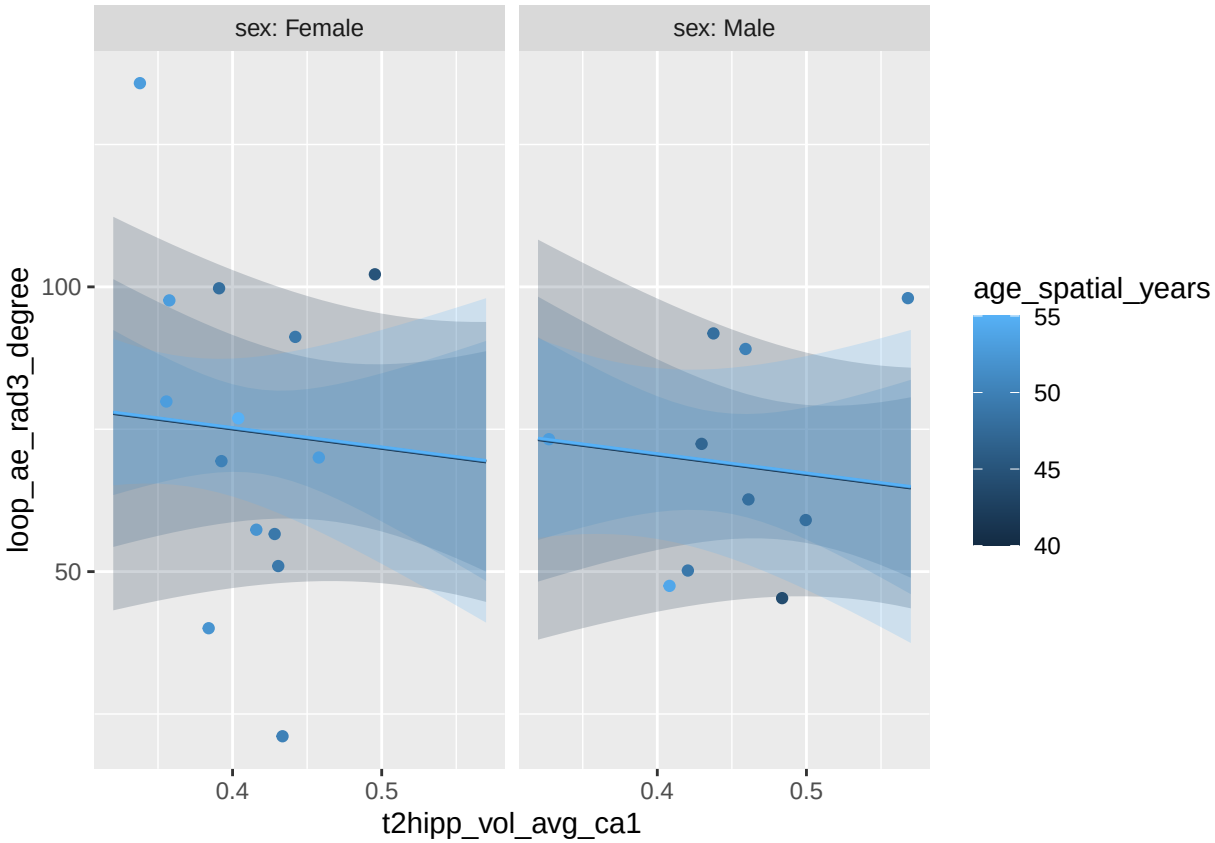
rad3

CA1

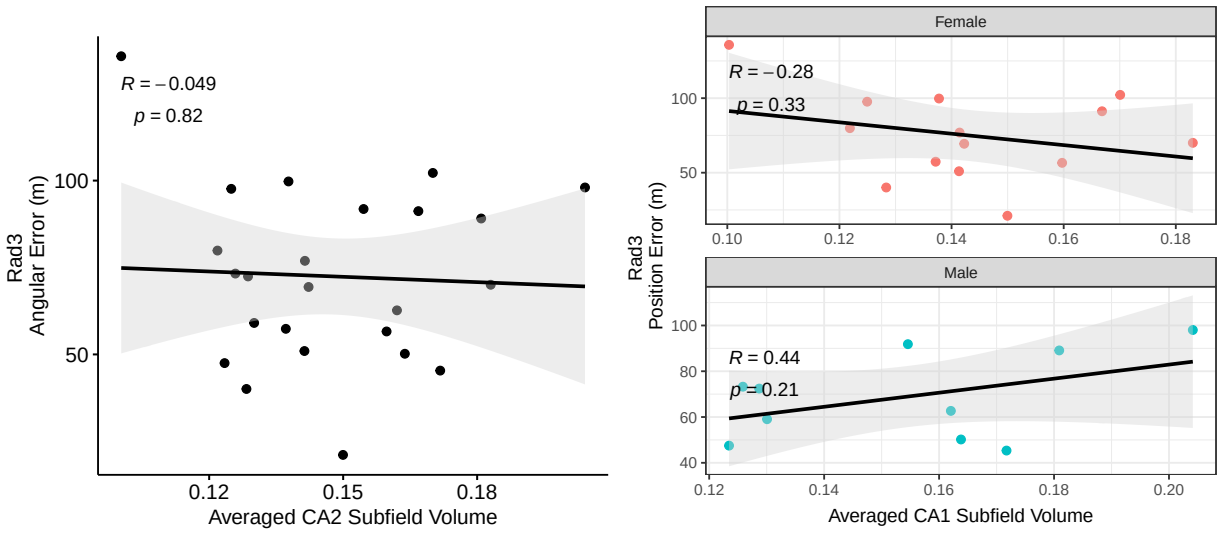


Running multiple linear regressions to see the effect of age and sex and then plotting results

```
##
## Call:
## lm(formula = loop_ae_rad3_degree ~ t2hipp_vol_avg_ca1 + age_spatial_years +
##     sex, data = df)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -52.982 -18.156  -1.588  20.583  58.394
##
## Coefficients:
##                     Estimate Std. Error t value Pr(>|t|)
## (Intercept)         87.91165  158.35101   0.555    0.585
## t2hipp_vol_avg_ca1 -33.97922  128.81707  -0.264    0.795
## age_spatial_years    0.01789    2.44357   0.007    0.994
## sexMale             -4.57715   12.08037  -0.379    0.709
##
## Residual standard error: 26.92 on 20 degrees of freedom
##   (4 observations deleted due to missingness)
## Multiple R-squared:  0.01897,    Adjusted R-squared:  -0.1282
## F-statistic: 0.1289 on 3 and 20 DF,  p-value: 0.9418
```

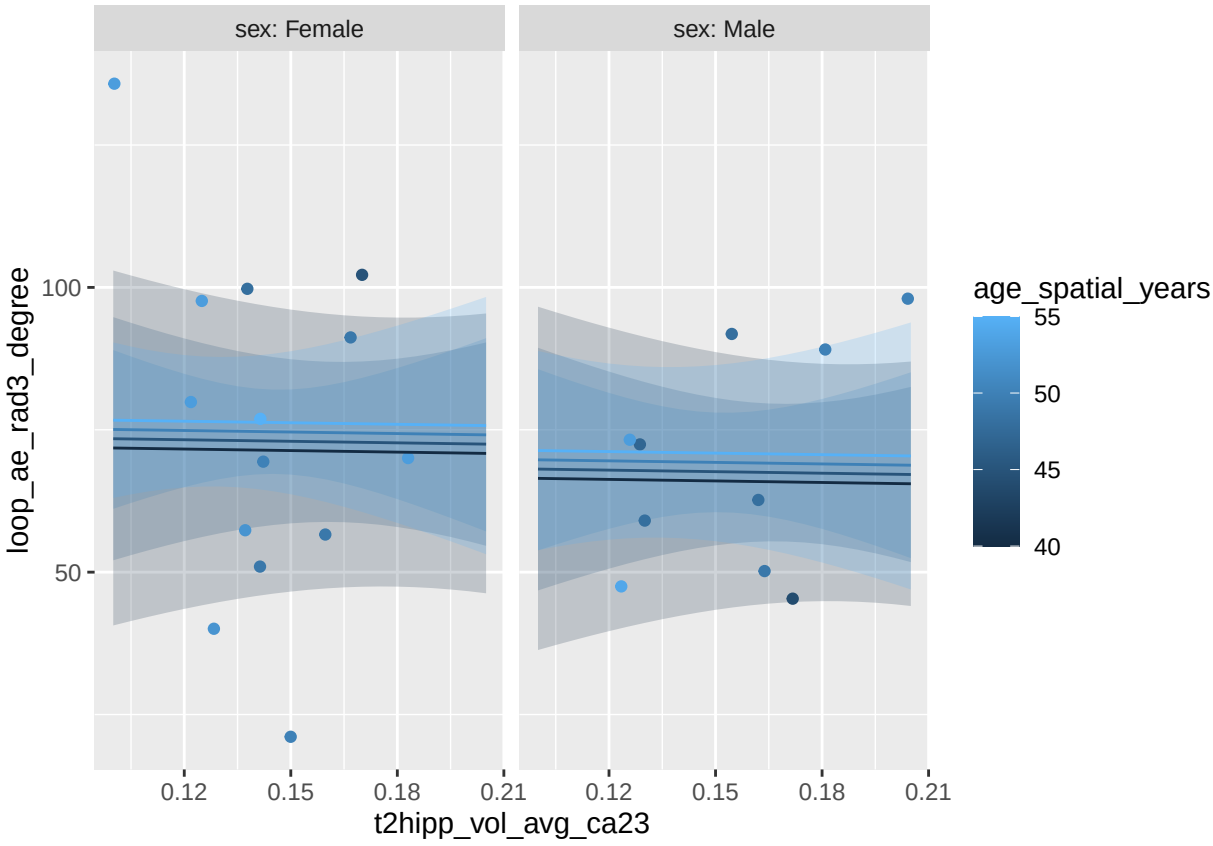

sex: Female
sex: Male
loop_ae_rad3_degree
100
50
0.4
0.5
t2hipp_vol_avg_ca1
age_spatial_years
55
50
45
40

CA2/3

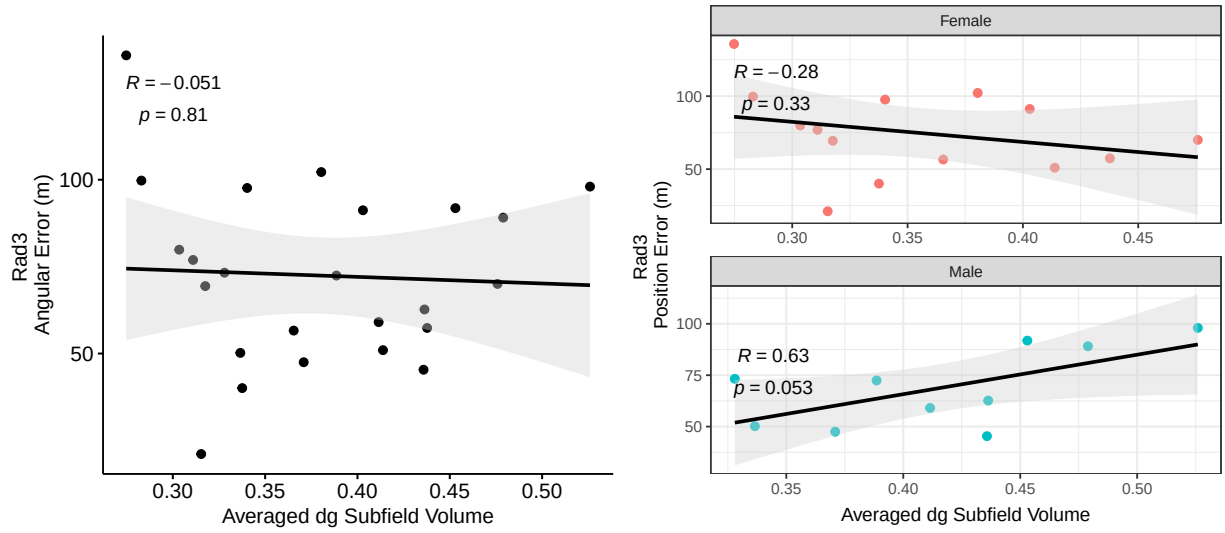

R = −0.049
p = 0.82
Rad3
Angular Error (m)
100
50
0.12
0.15
0.18
Averaged CA2 Subfield Volume
Female
R = −0.28
p = 0.33
Male
R = 0.44
p = 0.21
Rad3
Position Error (m)
0.10
0.12
0.14
0.16
0.18
0.20
Averaged CA1 Subfield Volume

Running multiple linear regressions to see the effect of age and sex and then plotting results

```
##
## Call:
## lm(formula = loop_ae_rad3_degree ~ t2hipp_vol_avg_ca23 + age_spatial_years +
##     sex, data = df)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -53.511 -18.167  -2.319  20.532  59.742
##
## Coefficients:
##                     Estimate Std. Error t value Pr(>|t|)
## (Intercept)          59.6795   133.0222   0.449    0.659
## t2hipp_vol_avg_ca23  -9.0246   257.8952  -0.035    0.972
## age_spatial_years     0.3256     2.2524   0.145    0.887
## sexMale              -5.3319    11.8003  -0.452    0.656
##
## Residual standard error: 26.97 on 20 degrees of freedom
##   (4 observations deleted due to missingness)
## Multiple R-squared:  0.01562,    Adjusted R-squared:  -0.132
## F-statistic: 0.1058 on 3 and 20 DF,  p-value: 0.9557
```

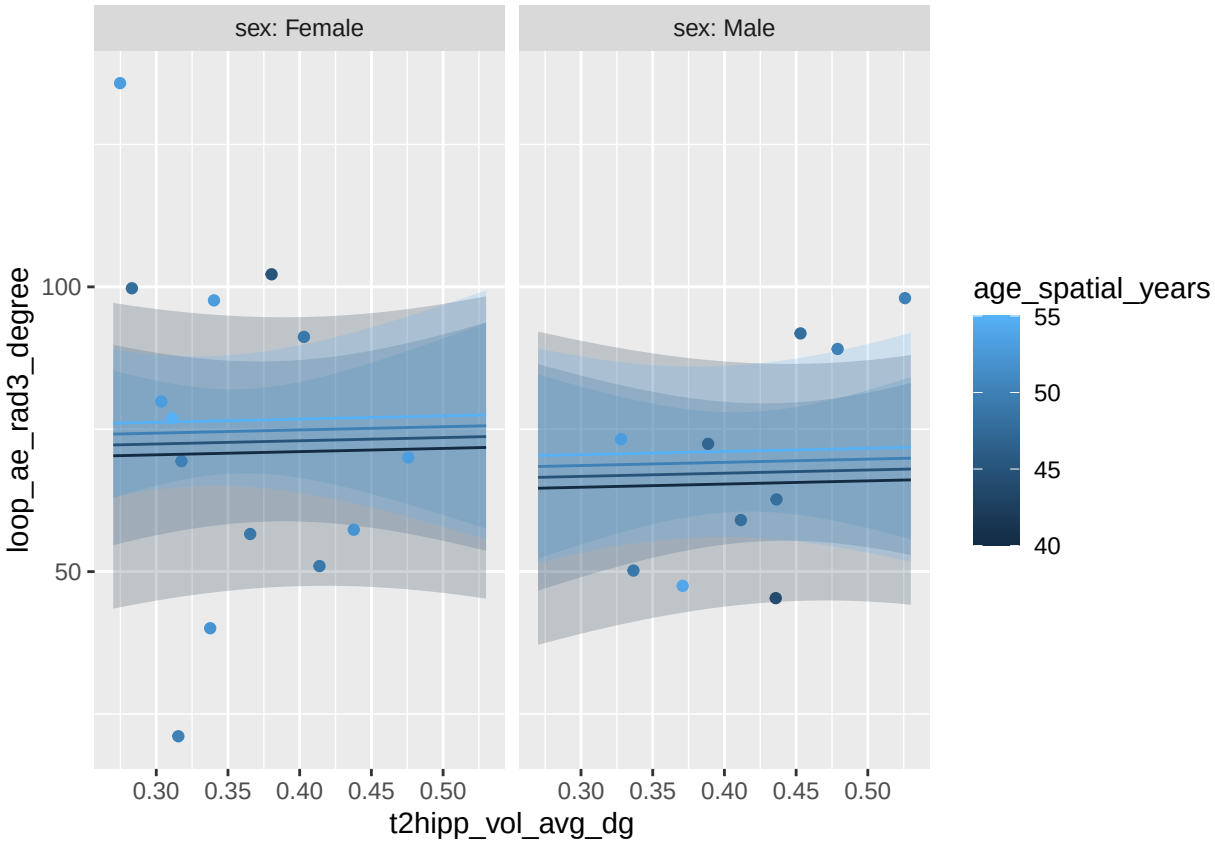


DG

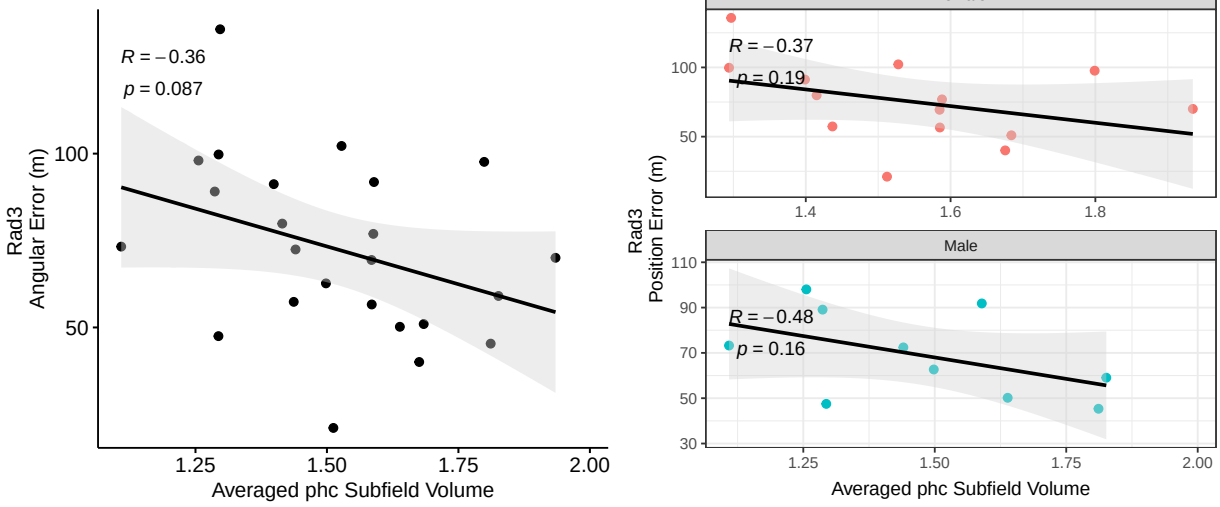


Running multiple linear regressions to see the effect of age and sex and then plotting results

```
##
## Call:
## lm(formula = loop_ae_rad3_degree ~ t2hipp_vol_avg_dg + age_spatial_years +
##     sex, data = df)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -53.310 -18.320  -2.189  20.083  60.453
##
## Coefficients:
##                   Estimate Std. Error t value Pr(>|t|)
## (Intercept)        53.5843   120.0348   0.446    0.660
## t2hipp_vol_avg_dg   5.6223    95.7789   0.059    0.954
## age_spatial_years   0.3809     2.1303   0.179    0.860
## sexMale            -5.6911    12.8234  -0.444    0.662
##
## Residual standard error: 26.97 on 20 degrees of freedom
##   (4 observations deleted due to missingness)
## Multiple R-squared:  0.01573,    Adjusted R-squared:  -0.1319
## F-statistic: 0.1065 on 3 and 20 DF,  p-value: 0.9553
```

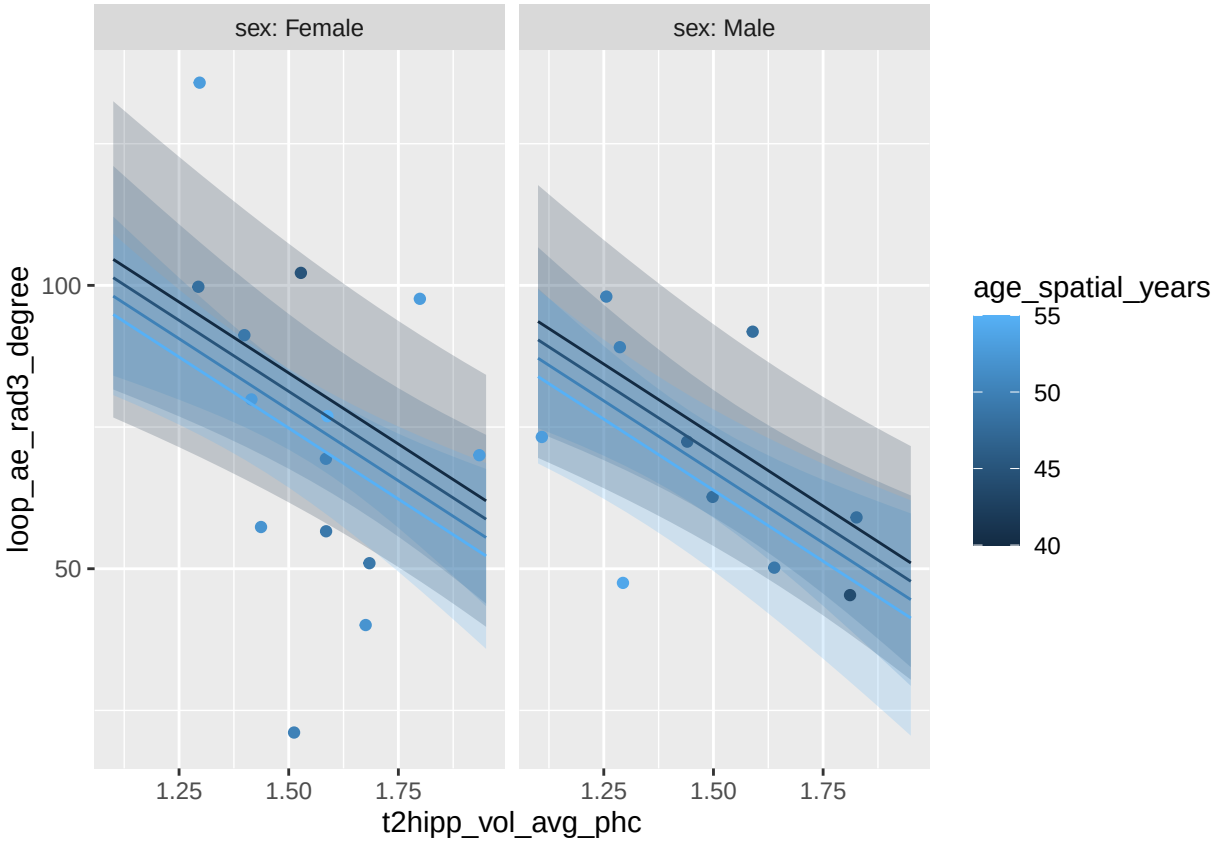

sex: Female
sex: Male
loop_ae_rad3_degree
100
50
0.30
0.35
0.40
0.45
0.50
t2hipp_vol_avg_dg
age_spatial_years
55
50
45
40

PHC

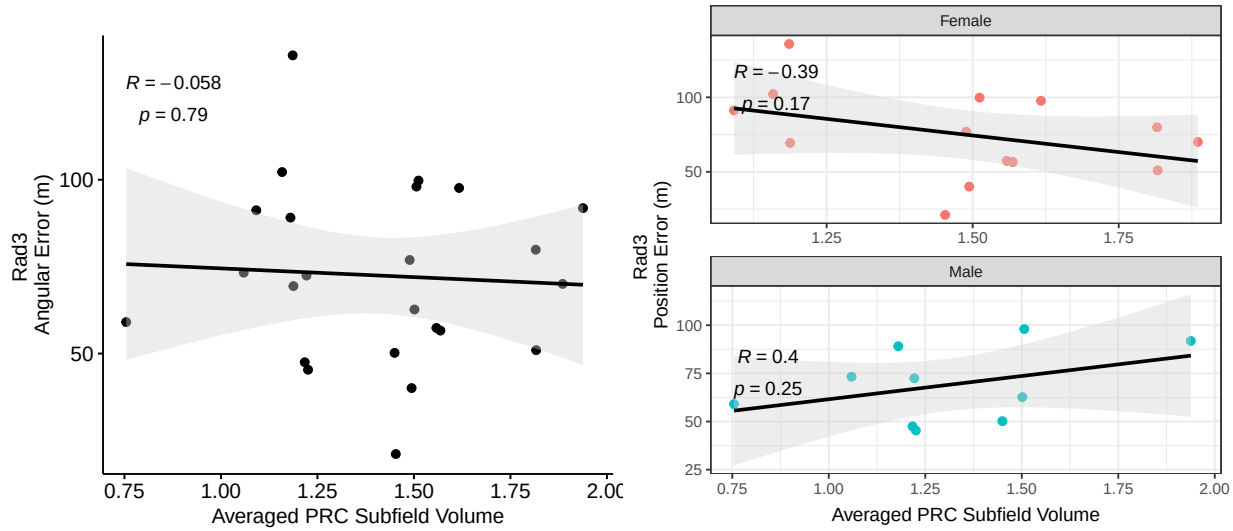

R = −0.36
p = 0.087
Rad3
Angular Error (m)
100
50
1.25
1.50
1.75
2.00
Averaged phc Subfield Volume
Female
R = −0.37
p = 0.19
100
50
1.4
1.6
1.8
Male
R = −0.48
p = 0.16
Rad3
Position Error (m)
110
90
70
50
30
1.25
1.50
1.75
2.00
Averaged phc Subfield Volume

Running multiple linear regressions to see the effect of age and sex and then plotting results

```
##
## Call:
## lm(formula = loop_ae_rad3_degree ~ t2hipp_vol_avg_phc + age_spatial_years +
##     sex, data = df)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -56.350 -13.091  -0.053  12.407  49.480
##
## Coefficients:
##                    Estimate Std. Error t value Pr(>|t|)
## (Intercept)        185.6631   118.6032   1.565   0.1332
## t2hipp_vol_avg_phc -50.1303    26.2231  -1.912   0.0704 .
## age_spatial_years   -0.6482     1.9882  -0.326   0.7478
## sexMale            -10.9588    11.1530  -0.983   0.3375
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 24.8 on 20 degrees of freedom
##   (4 observations deleted due to missingness)
## Multiple R-squared:  0.1677, Adjusted R-squared:  0.0428
## F-statistic: 1.343 on 3 and 20 DF,  p-value: 0.2887
```

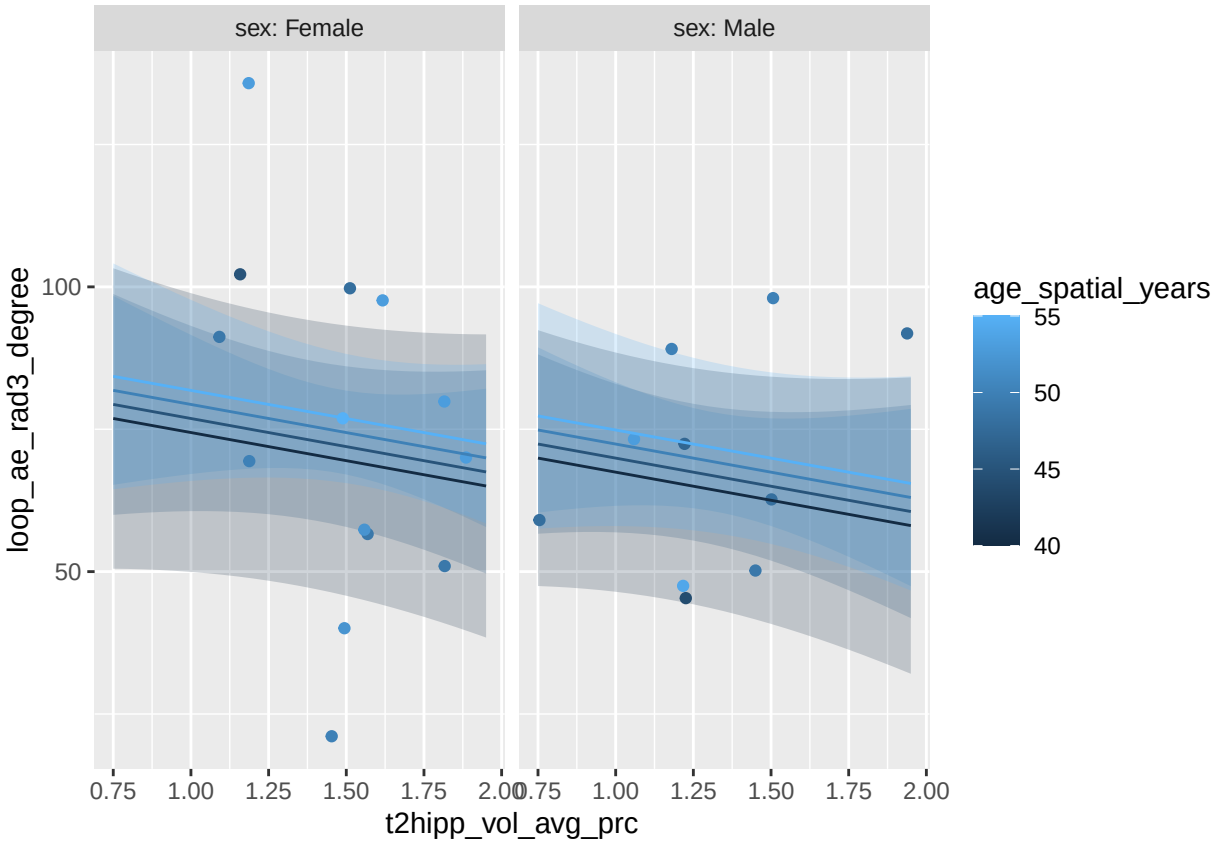


PRC

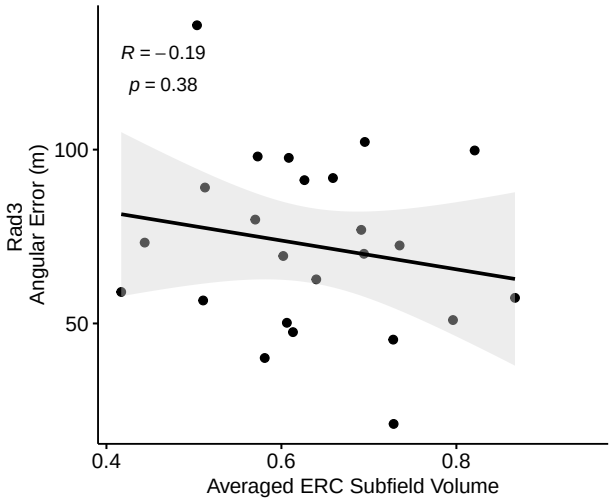


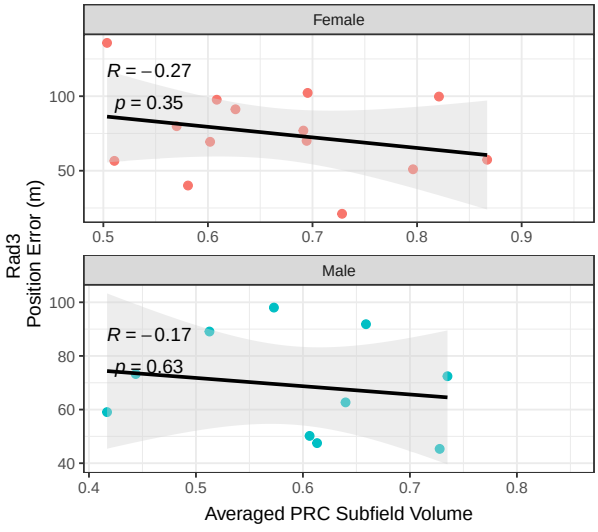
Running multiple linear regressions to see the effect of age and sex and then plotting results

```
##
## Call:
## lm(formula = loop_ae_rad3_degree ~ t2hipp_vol_avg_prc + age_spatial_years +
##     sex, data = df)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -53.787 -17.322  -1.064  19.579  56.773
##
## Coefficients:
##                    Estimate Std. Error t value Pr(>|t|)
## (Intercept)         64.5652   106.7372   0.605    0.552
## t2hipp_vol_avg_prc  -9.8784    20.4537  -0.483    0.634
## age_spatial_years    0.4934     2.0930   0.236    0.816
## sexMale             -6.9556    12.0860  -0.576    0.571
##
## Residual standard error: 26.81 on 20 degrees of freedom
##   (4 observations deleted due to missingness)
## Multiple R-squared:  0.02691,    Adjusted R-squared:  -0.1191
## F-statistic: 0.1843 on 3 and 20 DF,  p-value: 0.9058
```


sex: Female
sex: Male
loop_ae_rad3_degree
100
50
0.75
1.00
1.25
1.50
1.75
2.00
t2hipp_vol_avg_prc
age_spatial_years
55
50
45
40

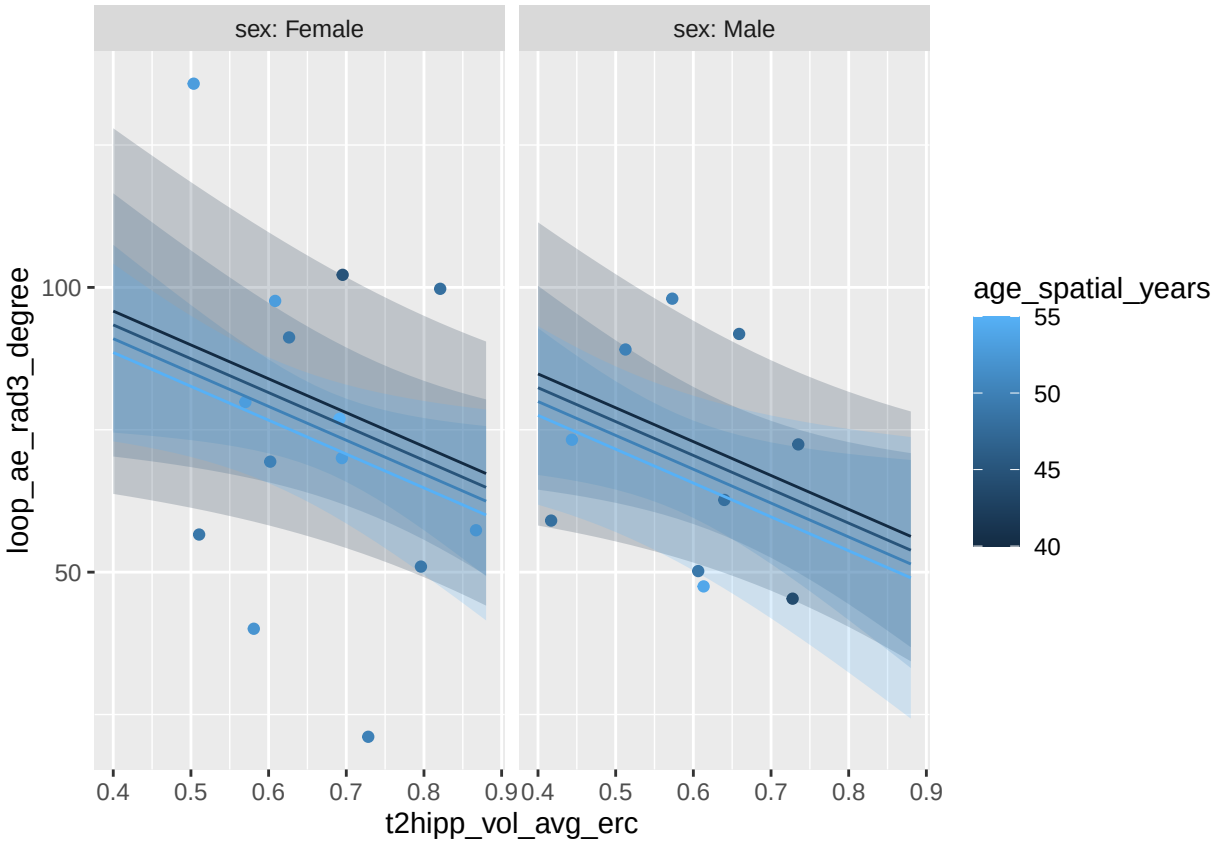
ERC


R = −0.19
p = 0.38
Rad3
Angular Error (m)
100
50
0.4
0.6
0.8
Averaged ERC Subfield Volume

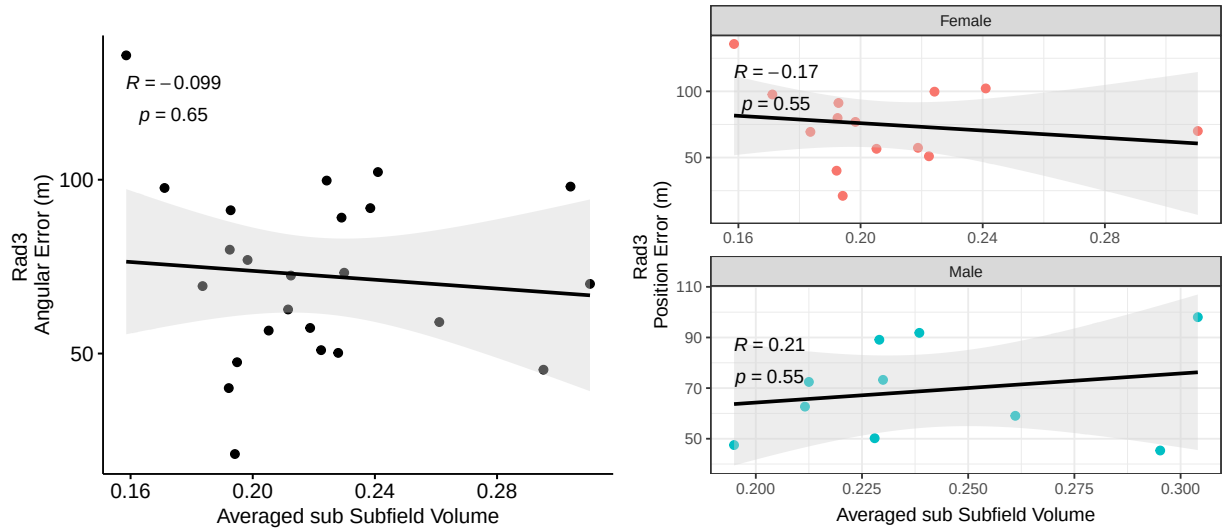

Female
R = −0.27
p = 0.35
Male
R = −0.17
p = 0.63
Rad3
Position Error (m)
100
50
80
60
40
0.4
0.5
0.6
0.7
0.8
0.9
Averaged PRC Subfield Volume

Running multiple linear regressions to see the effect of age and sex and then plotting results

```
##
## Call:
## lm(formula = loop_ae_rad3_degree ~ t2hipp_vol_avg_erc + age_spatial_years +
##     sex, data = df)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -50.386 -17.883  -2.328  16.995  52.388
##
## Coefficients:
##                     Estimate Std. Error t value Pr(>|t|)
## (Intercept)         139.0132   127.2092   1.093    0.287
## t2hipp_vol_avg_erc -59.4390    53.9482  -1.102    0.284
## age_spatial_years   -0.4849     2.1638  -0.224    0.825
## sexMale            -11.0335    12.4704  -0.885    0.387
##
## Residual standard error: 26.19 on 20 degrees of freedom
##   (4 observations deleted due to missingness)
## Multiple R-squared:  0.07189,    Adjusted R-squared:  -0.06733
## F-statistic: 0.5164 on 3 and 20 DF,  p-value: 0.6757
```

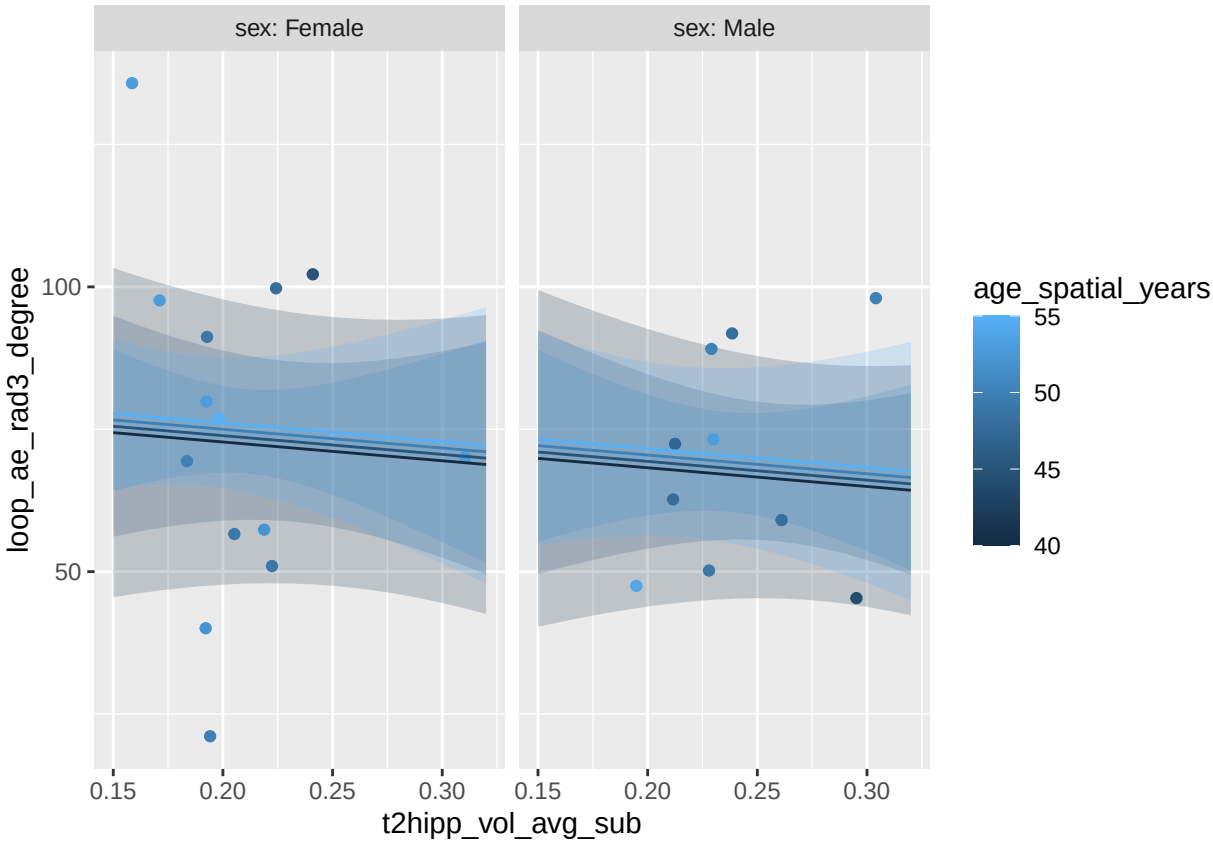


SUB



Running multiple linear regressions to see the effect of age and sex and then plotting results

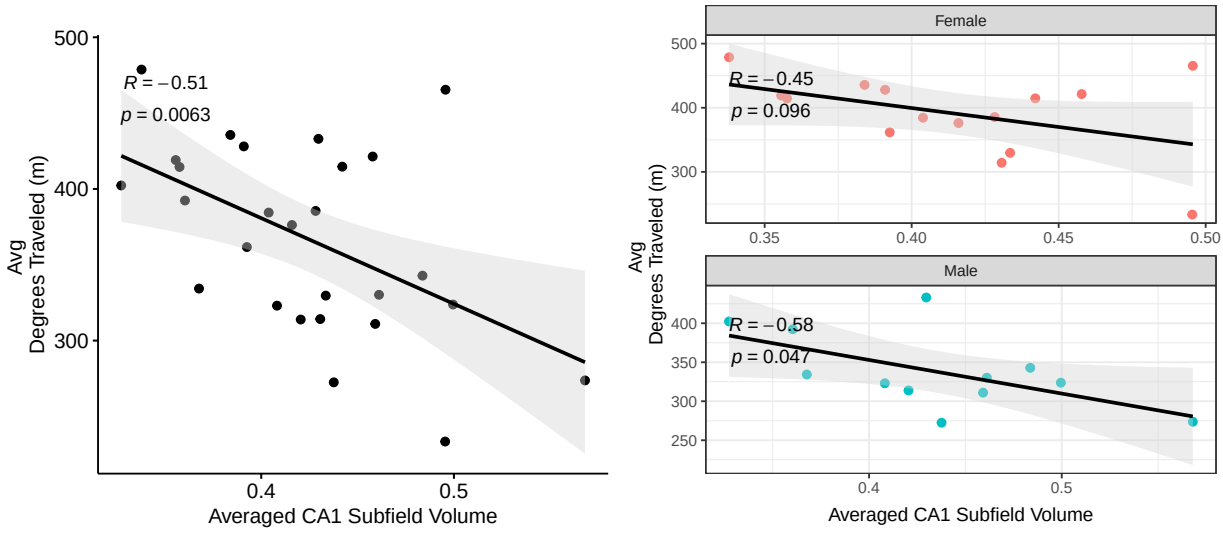
```
##
## Call:
## lm(formula = loop_ae_rad3_degree ~ t2hipp_vol_avg_sub + age_spatial_years +
##     sex, data = df)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -54.092 -18.278  -0.619  19.939  58.744
##
## Coefficients:
##                    Estimate Std. Error t value Pr(>|t|)
## (Intercept)         70.4116   126.0350   0.559    0.583
## t2hipp_vol_avg_sub -32.9302   165.6601  -0.199    0.844
## age_spatial_years    0.2234     2.1867   0.102    0.920
## sexMale             -4.5207    12.4757  -0.362    0.721
##
## Residual standard error: 26.94 on 20 degrees of freedom
##   (4 observations deleted due to missingness)
## Multiple R-squared:  0.0175, Adjusted R-squared:  -0.1299
## F-statistic: 0.1187 on 3 and 20 DF,  p-value: 0.948
```


sex: Female
sex: Male
loop_ae_rad3_degree
100
50
0.15
0.20
0.25
0.30
t2hipp_vol_avg_sub
age_spatial_years
55
50
45
40

Degrees Traveled Error

Average

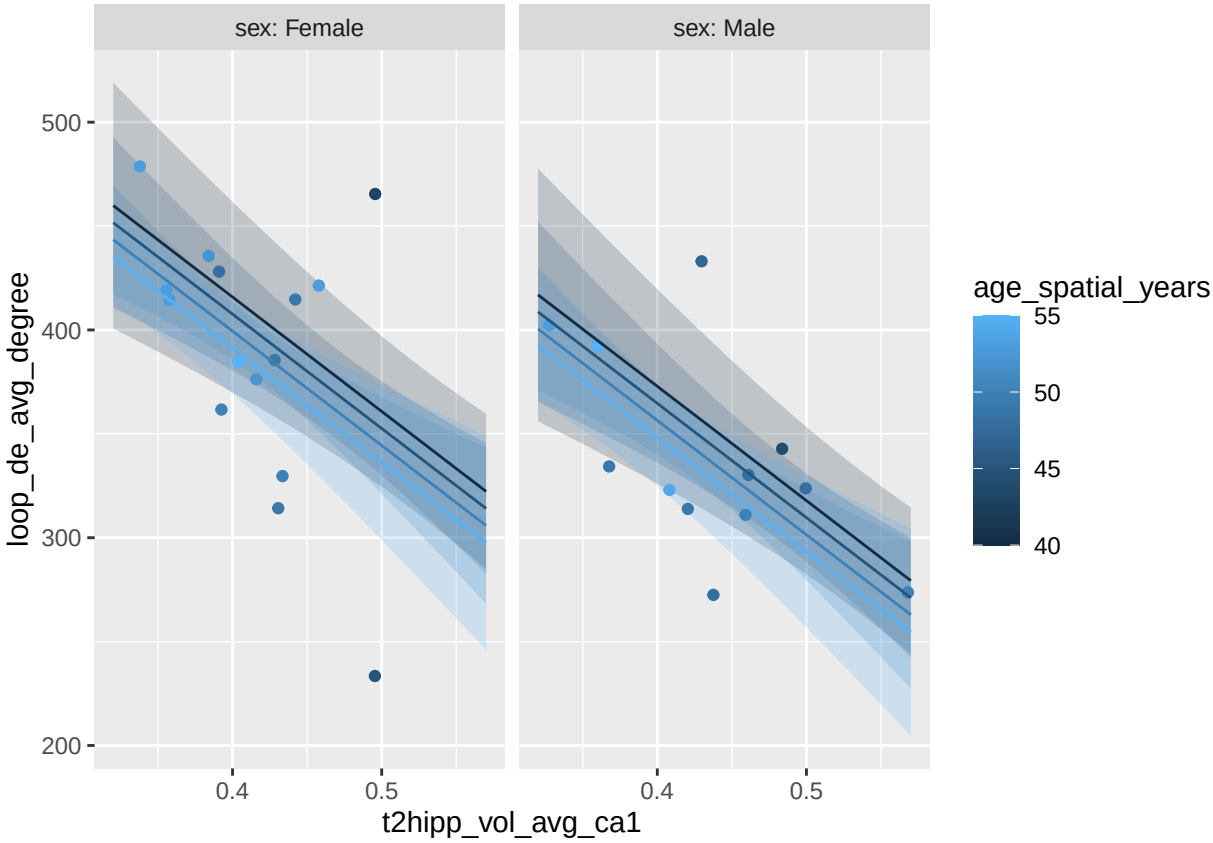
CA1



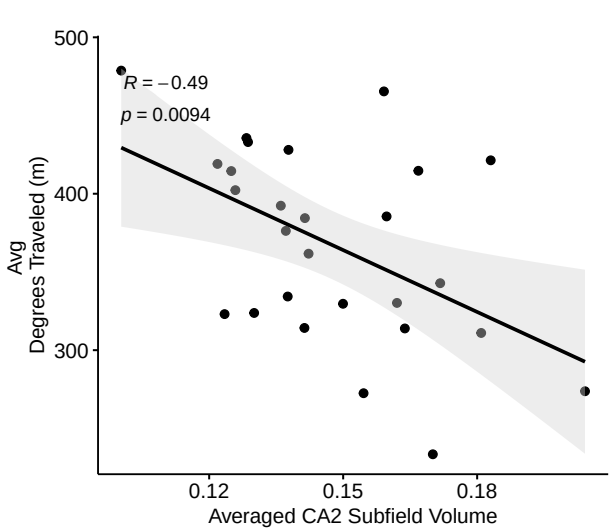
Running multiple linear regressions to see the effect of age and sex and then plotting results

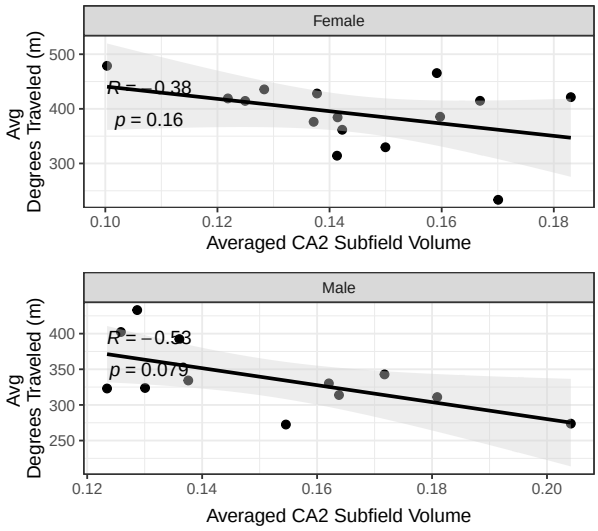
```
##
## Call:
## lm(formula = loop_de_avg_degree ~ t2hipp_vol_avg_ca1 + age_spatial_years +
##     sex, data = df)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -121.653  -27.648    0.156   22.438  107.166
##
## Coefficients:
##                    Estimate Std. Error t value Pr(>|t|)
## (Intercept)         701.593    273.313   2.567   0.0172 *
## t2hipp_vol_avg_ca1 -550.335    230.701  -2.385   0.0257 *
## age_spatial_years    -1.641      4.064  -0.404   0.6901
## sexMale             -42.948     20.398  -2.106   0.0464 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 51.76 on 23 degrees of freedom
##   (1 observation deleted due to missingness)
```

```
## Multiple R-squared:  0.3851, Adjusted R-squared:  0.3049
## F-statistic: 4.802 on 3 and 23 DF,  p-value: 0.009683
```

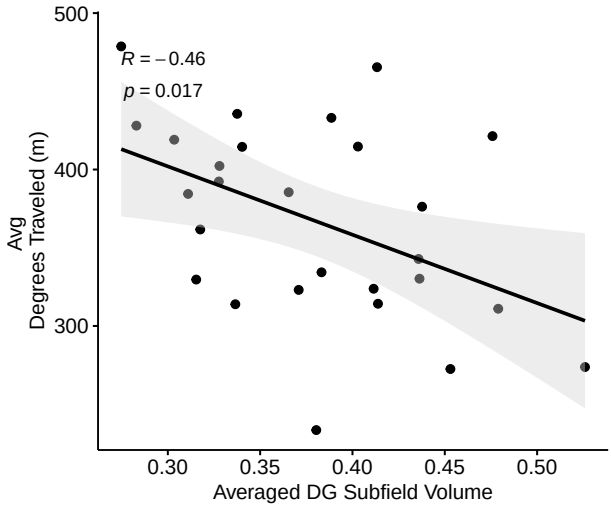


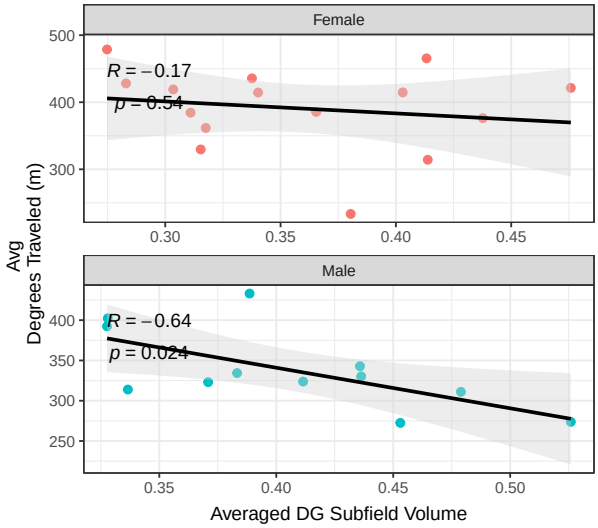
CA2/3


R = −0.49
p = 0.0094
Avg Degrees Traveled (m)
Averaged CA2 Subfield Volume

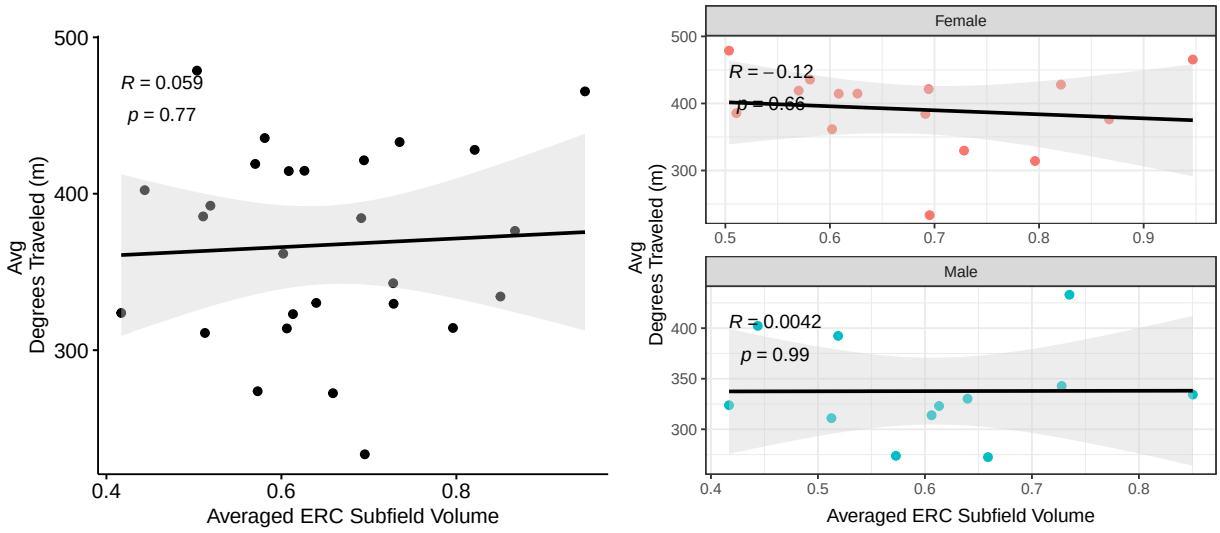

Female
R = −0.38
p = 0.16
Male
R = −0.53
p = 0.079
Avg Degrees Traveled (m)
Averaged CA2 Subfield Volume

DG

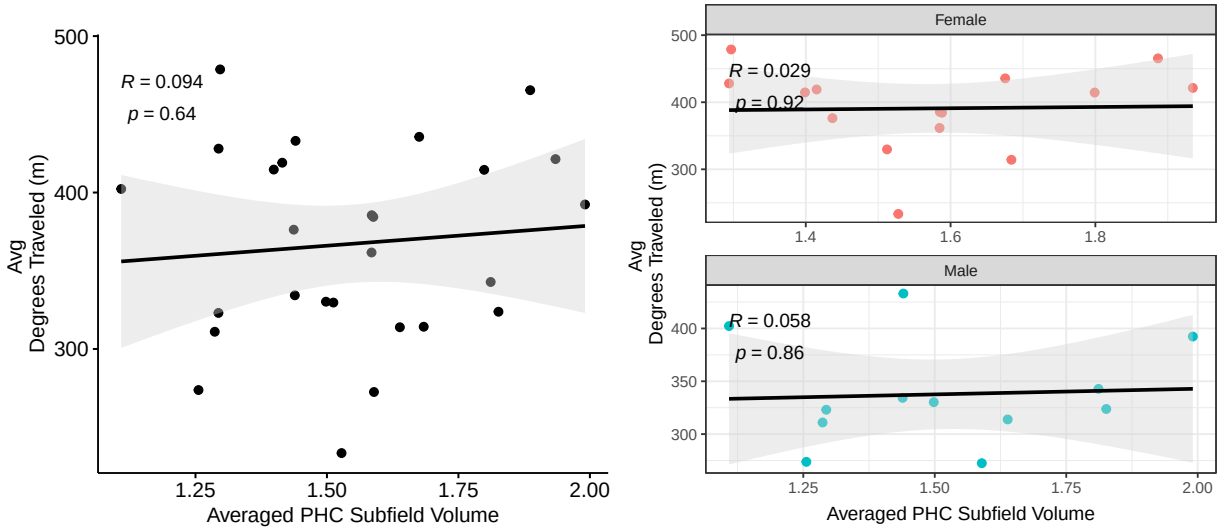

R = −0.46
p = 0.017
Avg Degrees Traveled (m)
Averaged DG Subfield Volume


Female
R = −0.17
p = 0.54
Male
R = −0.64
p = 0.024
Avg Degrees Traveled (m)
Averaged DG Subfield Volume

ERC


R = 0.059
p = 0.77
Avg Degrees Traveled (m)
Averaged ERC Subfield Volume
Female
R = −0.12
p = 0.66
Male
R = 0.0042
p = 0.99

PHC


R = 0.094
p = 0.64
Avg Degrees Traveled (m)
Averaged PHC Subfield Volume
Female
R = 0.029
p = 0.92
Male
R = 0.058
p = 0.86

Rad3