R Notebook

In this little experiment, I wanted to double check that the ROIs at least matched up in the same way. To do so. I asked a pretty simple question, is the thickness from this ROI more correlated (measured with package A), more correlated with the thickness from this ROI (measured with package B), than it is with the thickness of any other ROI (measured with package B). So I created tables that report 3 values:

1. **rho**: the correlation of ROI (package A vs package B)
2. **popZ**: The Z-score of this correlation values within the pools of all correlations between all ROIs of the other package
3. **rankZ**: The Percent Rank of this ROI compared to all other ROI's from package B (1 is the best)

```
library(dplyr)
library(tidyr)
library(knitr)
```

Step 1 Read in the Data

```
fs5.1  = read.csv('../data/cortical_fs5.1_measuresenigma_thickavg.csv', header = T)
fs5.3 = read.csv('../data/ABIDE_fs5.3_thickness.csv', header = T)
ants = read.csv('../data/ABIDE_ants_thickness_data_r.csv', header = T)
pheno = read.csv('../data/ABIDE_Phenotype.csv', header = T)
```

Compare Freesurfer 5.1 to Freesurfer 5.3

```
## merge and generate correlation matrixes for sanity check
fs5.1and5.3 = merge(fs5.1, fs5.3, by = "SubjID", suffixes = c('_fs5.1','_fs5.3'))
ants_fs5.1 = merge(ants, fs5.1, by.x = 'Code', by.y = 'SubjID', suffixes = c('ants','_fs5.1'))

cor5.1to5.3 <- cor(select(fs5.1and5.3, ends_with('_fs5.1')),select(fs5.1and5.3, ends_with('_fs5.3')))

fsdf <- as.data.frame(cor5.1to5.3)
fsdf$fs5.1_var <- row.names(fsdf)
fs_g <- gather(fsdf, fs5.3_var, rho, -fs5.1_var)

df <- fs_g %>%
  separate(fs5.1_var, c("hemi1","stuff"), sep = '_', extra = "merge", fill = "left") %>%
  separate(stuff, c("region1","version1"), sep = '_', extra = "merge", fill = "right") %>%
  separate(fs5.3_var, c("hemi3","stuff"), sep = '_', extra = "merge", fill = "left") %>%
  separate(stuff, c("region3","version3"), sep = '_', extra = "merge", fill = "right")

df$roipair <- NA
df$roipair[df$hemi1==df$hemi3 & df$region1==df$region3] <- "same"
df$roipair[df$hemi1!=df$hemi3 & df$region1==df$region3] <- "contralateral"
df$roipair[df$region1!=df$region3] <- "cross"

df$Z <- atanh(df$rho)

checks_fs5.35.1 <- df %>%
  filter(hemi1 %in% c('L','R'), hemi3 %in% c('L','R')) %>%
```

```
  group_by(region1, hemi1) %>%
  mutate(popZ = as.numeric(scale(Z)),
         rankZ = as.numeric(rank(Z), ties.method = "first")/n()) %>%
  ungroup() %>%
  filter(roipair == "same")


kable(select(checks_fs5.35.1, region1, hemi1, rho, popZ, rankZ),
      caption = "Comparison of Freesurfer 5.1 to Freesurfer 5.3")
```

Table 1: Comparison of Freesurfer 5.1 to Freesurfer 5.3

region1	hemi1	rho	popZ	rankZ
bankssts	L	0.9101637	4.462307	1
caudalanteriorcingulate	L	0.8976968	5.895770	1
caudalmiddlefrontal	L	0.9076634	3.571863	1
cuneus	L	0.9100416	4.428787	1
entorhinal	L	0.8358041	5.085939	1
fusiform	L	0.8550177	3.845962	1
inferiorparietal	L	0.9213235	3.692470	1
inferiortemporal	L	0.8347722	3.676527	1
isthmuscingulate	L	0.8226277	5.131821	1
lateraloccipital	L	0.9068552	4.030595	1
lateralorbitofrontal	L	0.8881424	4.873926	1
lingual	L	0.9340700	4.768019	1
medialorbitofrontal	L	0.8619501	5.117489	1
middletemporal	L	0.8845981	3.940024	1
parahippocampal	L	0.8933873	6.226981	1
paracentral	L	0.9387039	4.255522	1
parsopercularis	L	0.8990182	3.762795	1
parsorbitalis	L	0.8674510	3.969854	1
parstriangularis	L	0.9058958	3.809230	1
pericalcarine	L	0.9021783	4.725235	1
postcentral	L	0.8992677	3.842972	1
posteriorcingulate	L	0.8889897	5.327658	1
precentral	L	0.9217095	3.735173	1
precuneus	L	0.9307007	4.033053	1
rostralanteriorcingulate	L	0.8525916	5.651098	1
rostralmiddlefrontal	L	0.9162167	3.629975	1
superiorfrontal	L	0.9088718	3.342941	1
superiorparietal	L	0.9192328	3.579521	1
superiortemporal	L	0.9021422	4.207461	1
supramarginal	L	0.9286493	3.688751	1
frontalpole	L	0.8374953	4.303174	1
temporalpole	L	0.7999935	4.530110	1
transversetemporal	L	0.8880359	4.908515	1
insula	L	0.8344587	4.588590	1
bankssts	R	0.8987761	4.513439	1
caudalanteriorcingulate	R	0.8830956	6.006308	1
caudalmiddlefrontal	R	0.8677847	3.296685	1
cuneus	R	0.8889727	4.299529	1
entorhinal	R	0.8139154	4.888636	1
fusiform	R	0.8292580	3.907469	1

region1	hemi1	rho	popZ	rankZ
inferiorparietal	R	0.8758163	3.205971	1
inferiortemporal	R	0.8305211	3.747643	1
isthmuscingulate	R	0.8473810	5.140973	1
lateraloccipital	R	0.8600589	3.761061	1
lateralorbitofrontal	R	0.8501931	4.270455	1
lingual	R	0.8829017	4.233124	1
medialorbitofrontal	R	0.8576170	4.840557	1
middletemporal	R	0.8345367	3.359281	1
parahippocampal	R	0.8701588	5.652727	1
paracentral	R	0.9105918	3.805904	1
parsopercularis	R	0.8547224	3.818404	1
parsorbitalis	R	0.8666728	4.044331	1
parstriangularis	R	0.8833655	3.767170	1
pericalcarine	R	0.8508993	4.374921	1
postcentral	R	0.8416930	3.613994	1
posteriorcingulate	R	0.7783980	4.607568	1
precentral	R	0.8674248	3.335701	1
precuneus	R	0.8977546	3.679029	1
rostralanteriorcingulate	R	0.8473520	6.163205	1
rostralmiddlefrontal	R	0.9032436	3.763007	1
superiorfrontal	R	0.8861852	3.242727	1
superiorparietal	R	0.8610255	3.387476	1
superiortemporal	R	0.8590687	3.805432	1
supramarginal	R	0.8791039	3.157655	1
frontalpole	R	0.8237885	4.530520	1
temporalpole	R	0.7710270	4.168297	1
transversetemporal	R	0.8489185	4.524920	1
insula	R	0.7646380	3.949668	1

```
summary_report_fs5.3.5.1 <- checks_fs5.35.1 %>%
  filter(roipair == "same") %>%
  ungroup() %>%
  summarise(Mean = mean(rho),
            Min = min(rho),
            Max = max(rho))

kable(summary_report_fs5.3.5.1, caption = "Summary of Freesurfer 5.3 to Freesurfer 5.1")
```

Table 2: Summary of Freesurfer 5.3 to Freesurfer 5.1

Mean	Min	Max
0.8719496	0.764638	0.9387039

```
ants_fs5.1 = merge(ants, fs5.1, by.x = 'Code', by.y = 'SubjID', suffixes = c('ants','_fs5.1'))

cor5.1toants <- cor(select(ants_fs5.1, starts_with('left'), starts_with('right')),select(ants_fs5.1, sta

fsdf <- as.data.frame(cor5.1toants)
fsdf$ants_var <- row.names(fsdf)
fs_g <- gather(fsdf, fs5.1_var, rho, -ants_var)
```

```
df <- fs_g %>%
  separate(fs5.1_var, c("hemi1","stuff"), sep = '_', extra = "merge", fill = "left") %>%
  separate(stuff, c("region1","version1"), sep = '_', extra = "merge", fill = "right") %>%
  separate(ants_var, c("hemi_a","stuff"), sep = '\\.', extra = "merge", fill = "left")

df$region_ants <-  gsub('\\.','',df$stuff)

df$hemi_ants <- NA
df$hemi_ants[df$hemi_a == "left"] <- "L"
df$hemi_ants[df$hemi_a == "right"] <- "R"

df$roipair <- NA
df$roipair[df$hemi1==df$hemi_ants & df$region1==df$region_ants] <- "same"
df$roipair[df$hemi1!=df$hemi_ants & df$region1==df$region_ants] <- "contralateral"
df$roipair[df$region1!=df$region_ants] <- "cross"

df$Z <- atanh(df$rho)

checks_fs5.1ants <- df %>%
  filter(hemi1 %in% c('L','R'), hemi_ants %in% c('L','R'), !is.na(rho)) %>%
  group_by(region1, hemi1) %>%
  mutate(popZ = as.numeric(scale(Z)),
         rankZ = as.numeric(rank(Z),ties.method = "first")/n())

kable(select(filter(checks_fs5.1ants,roipair=="same"), region1, hemi1, rho, popZ, rankZ),
      caption = "Comparison of Freesurfer 5.1 to ANTS")
```

Table 3: Comparison of Freesurfer 5.1 to ANTS

region1	hemi1	rho	popZ	rankZ
caudalanteriorcingulate	L	0.2206556	1.7630325	0.9213483
caudalmiddlefrontal	L	0.4906335	2.3595936	1.0000000
cuneus	L	0.5463324	3.0095424	1.0000000
entorhinal	L	0.4045428	1.5179926	0.9438202
fusiform	L	0.3084918	0.6553863	0.6966292
inferiorparietal	L	0.4465800	1.8858205	0.9887640
inferiortemporal	L	0.2925661	0.5930738	0.6629213
isthmuscingulate	L	0.2967954	1.9175746	0.9213483
lateraloccipital	L	0.3451861	1.4731690	0.8876404
lateralorbitofrontal	L	0.3960388	1.8150361	0.9775281
lingual	L	0.4258987	2.1153033	0.9550562
medialorbitofrontal	L	0.2308479	0.9969921	0.8426966
middletemporal	L	0.4544403	1.9640244	0.9550562
parahippocampal	L	0.5436401	3.2566959	1.0000000
paracentral	L	0.5383150	2.7370719	1.0000000
parsopercularis	L	0.4944040	2.1464887	0.9887640
parsorbitalis	L	0.4642459	2.1616881	0.9887640
parstriangularis	L	0.5638157	2.7880961	1.0000000
pericalcarine	L	0.4774892	2.8921937	1.0000000
postcentral	L	0.3532792	1.5544255	0.9213483
posteriorcingulate	L	0.3063975	1.7694669	0.9213483
precentral	L	0.5335484	2.7419821	1.0000000
precuneus	L	0.5628855	2.6768453	1.0000000

region1	hemi1	rho	popZ	rankZ
rostralanteriorcingulate	L	0.1945296	0.5382100	0.6741573
rostralmiddlefrontal	L	0.5356709	2.4963512	1.0000000
superiorfrontal	L	0.5081856	2.2963256	1.0000000
superiorparietal	L	0.4598919	2.0380076	0.9662921
superiortemporal	L	0.5757812	2.2903647	0.9887640
supramarginal	L	0.5255745	2.4769122	1.0000000
transversetemporal	L	0.4471937	2.1547279	1.0000000
insula	L	0.4668492	2.3846272	1.0000000
caudalanteriorcingulate	R	0.2060639	1.6743501	0.9213483
caudalmiddlefrontal	R	0.3789715	1.8686034	0.9775281
cuneus	R	0.4850643	2.8124339	1.0000000
entorhinal	R	0.4257005	1.6665923	0.9662921
fusiform	R	0.3953332	1.3759438	0.8988764
inferiorparietal	R	0.3980692	1.7426973	0.9775281
inferiortemporal	R	0.3819686	1.3154670	0.8988764
isthmuscingulate	R	0.3102490	2.0140841	0.9213483
lateraloccipital	R	0.3564507	1.7522285	0.9438202
lateralorbitofrontal	R	0.4894783	2.5277600	1.0000000
lingual	R	0.4092232	2.2411420	0.9887640
medialorbitofrontal	R	0.2733026	1.3959259	0.9213483
middletemporal	R	0.5375897	2.6366711	1.0000000
parahippocampal	R	0.5260459	2.6289900	1.0000000
paracentral	R	0.5472166	2.9189604	1.0000000
parsopercularis	R	0.4625236	2.2593819	1.0000000
parsorbitalis	R	0.4621071	2.2160709	0.9775281
parstriangularis	R	0.5443982	2.6794978	1.0000000
pericalcarine	R	0.3963888	2.7722974	1.0000000
postcentral	R	0.3530563	1.8968649	1.0000000
posteriorcingulate	R	0.2817009	1.8943317	0.9213483
precentral	R	0.4659028	2.5932762	1.0000000
precuneus	R	0.5123514	2.6940579	1.0000000
rostralanteriorcingulate	R	0.3510545	2.3634144	1.0000000
rostralmiddlefrontal	R	0.5073621	2.5170747	1.0000000
superiorfrontal	R	0.5030256	2.3807782	1.0000000
superiorparietal	R	0.4236839	2.0812547	0.9887640
superiortemporal	R	0.5911591	2.5192918	1.0000000
supramarginal	R	0.5031457	2.4577148	1.0000000
transversetemporal	R	0.3915666	1.9011166	0.9887640
insula	R	0.4777559	2.5923254	1.0000000

```
summary_report_fs5.1ants <- checks_fs5.1ants %>%
  filter(roipair == "same") %>%
  ungroup() %>%
  summarise(Mean = mean(rho),
            Min = min(rho),
            Max = max(rho))

kable(summary_report_fs5.1ants, caption = "Summary of Freesurfer 5.1 to ANTS comparsion")
```

Table 4: Summary of Freesurfer 5.1 to ANTS comparsion

Mean	Min	Max
0.4315906	0.1945296	0.5911591

```
kable(select(filter(checks_fs5.1ants,rankZ==1.0), region1, hemi1, region_ants, hemi_ants, rho, popZ, ra
      caption = "The most correlated region from ANTS for each ROI")
```

Table 5: The most correlated region from ANTS for each ROI

region1	hemi1	region_ants	hemi_ants	rho	popZ	rankZ
bankssts	L	supramarginal	L	0.4152559	2.087573	1
caudalanteriorcingulate	L	paracentral	L	0.3085564	2.724948	1
caudalmiddlefrontal	L	caudalmiddlefrontal	L	0.4906335	2.359594	1
cuneus	L	cuneus	L	0.5463324	3.009542	1
entorhinal	L	superiortemporal	R	0.4573453	1.913814	1
fusiform	L	lingual	R	0.4293519	1.535067	1
inferiorparietal	L	precuneus	R	0.4523869	1.928208	1
inferiortemporal	L	middletemporal	R	0.5101360	2.247581	1
isthmuscingulate	L	precuneus	L	0.3904086	2.733795	1
lateraloccipital	L	cuneus	R	0.5084063	2.587701	1
lateralorbitofrontal	L	parsorbitalis	L	0.4065808	1.902026	1
lingual	L	cuneus	R	0.4629391	2.388759	1
medialorbitofrontal	L	parstriangularis	R	0.3415877	1.976959	1
middletemporal	L	middletemporal	R	0.5269248	2.544612	1
parahippocampal	L	parahippocampal	L	0.5436401	3.256696	1
paracentral	L	paracentral	L	0.5383150	2.737072	1
parsopercularis	L	parstriangularis	L	0.5247496	2.384853	1
parsorbitalis	L	parstriangularis	L	0.5055120	2.489271	1
parstriangularis	L	parstriangularis	L	0.5638157	2.788096	1
pericalcarine	L	pericalcarine	L	0.4774892	2.892194	1
postcentral	L	paracentral	R	0.3936564	1.858558	1
posteriorcingulate	L	precuneus	L	0.4330005	2.778737	1
precentral	L	precentral	L	0.5335484	2.741982	1
precuneus	L	precuneus	L	0.5628855	2.676845	1
rostralanteriorcingulate	L	paracentral	R	0.3282748	1.858962	1
rostralmiddlefrontal	L	rostralmiddlefrontal	L	0.5356709	2.496351	1
superiorfrontal	L	superiorfrontal	L	0.5081856	2.296326	1
superiorparietal	L	precuneus	R	0.4893038	2.245373	1
superiortemporal	L	superiortemporal	R	0.5918975	2.419736	1
supramarginal	L	supramarginal	L	0.5255745	2.476912	1
frontalpole	L	rostralmiddlefrontal	L	0.3984708	2.361904	1
temporalpole	L	superiortemporal	R	0.5538200	2.206248	1
transversetemporal	L	transversetemporal	L	0.4471937	2.154728	1
insula	L	insula	L	0.4668492	2.384627	1
bankssts	R	supramarginal	R	0.4088876	1.889233	1
caudalanteriorcingulate	R	paracentral	L	0.2846817	2.587334	1
caudalmiddlefrontal	R	superiorfrontal	L	0.3926259	1.970193	1
cuneus	R	cuneus	R	0.4850643	2.812434	1
entorhinal	R	superiortemporal	R	0.4722043	2.010530	1
fusiform	R	superiortemporal	R	0.4498609	1.795398	1
inferiorparietal	R	precuneus	R	0.4324786	2.014803	1

region1	hemi1	region_ants	hemi_ants	rho	popZ	rankZ
inferiortemporal	R	superiortemporal	R	0.4879529	2.149333	1
isthmuscingulate	R	precuneus	L	0.3964581	2.795535	1
lateraloccipital	R	cuneus	R	0.4489967	2.463374	1
lateralorbitofrontal	R	lateralorbitofrontal	R	0.4894783	2.527760	1
lingual	R	cuneus	R	0.4272672	2.390289	1
medialorbitofrontal	R	rostralanteriorcingulate	L	0.3281812	1.836317	1
middletemporal	R	middletemporal	R	0.5375897	2.636671	1
parahippocampal	R	parahippocampal	R	0.5260459	2.628990	1
paracentral	R	paracentral	R	0.5472166	2.918960	1
parsopercularis	R	parsopercularis	R	0.4625236	2.259382	1
parsorbitalis	R	parstriangularis	R	0.4875493	2.416698	1
parstriangularis	R	parstriangularis	R	0.5443982	2.679498	1
pericalcarine	R	pericalcarine	R	0.3963888	2.772297	1
postcentral	R	postcentral	R	0.3530563	1.896865	1
posteriorcingulate	R	precuneus	R	0.3909741	2.984256	1
precentral	R	precentral	R	0.4659028	2.593276	1
precuneus	R	precuneus	R	0.5123514	2.694058	1
rostralanteriorcingulate	R	rostralanteriorcingulate	R	0.3510545	2.363414	1
rostralmiddlefrontal	R	rostralmiddlefrontal	R	0.5073621	2.517075	1
superiorfrontal	R	superiorfrontal	R	0.5030256	2.380778	1
superiorparietal	R	precuneus	R	0.4738715	2.479219	1
superiortemporal	R	superiortemporal	R	0.5911591	2.519292	1
supramarginal	R	supramarginal	R	0.5031457	2.457715	1
frontalpole	R	superiorfrontal	R	0.3597933	2.212083	1
temporalpole	R	superiortemporal	R	0.5439934	2.309225	1
transversetemporal	R	parsopercularis	R	0.4126603	2.094183	1
insula	R	insula	R	0.4777559	2.592325	1

```
ants_fs5.3 = merge(ants, fs5.3, by.x = 'Code', by.y = 'SubjID', suffixes = c('ants','_fs5.1'))

cor5.3toants <- cor(select(ants_fs5.3, starts_with('left'), starts_with('right')),select(ants_fs5.3, sta
```

```
## Warning in cor(select(ants_fs5.3, starts_with("left"),
## starts_with("right")), : the standard deviation is zero
```

```
fsdf <- as.data.frame(cor5.3toants)
fsdf$ants_var <- row.names(fsdf)
fs_g <- gather(fsdf, fs5.3_var, rho, -ants_var)

df <- fs_g %>%
  separate(fs5.3_var, c("hemi3","stuff"), sep = '_', extra = "merge", fill = "left") %>%
  separate(stuff, c("region3","version3"), sep = '_', extra = "merge", fill = "right") %>%
  separate(ants_var, c("hemi_a","stuff"), sep = '\\.', extra = "merge", fill = "left")

df$region_ants <-  gsub('\\.','',df$stuff)

df$hemi_ants <- NA
df$hemi_ants[df$hemi_a == "left"] <- "L"
df$hemi_ants[df$hemi_a == "right"] <- "R"

df$roipair <- NA
df$roipair[df$hemi3==df$hemi_ants & df$region3==df$region_ants] <- "same"
```

```
df$roipair[df$hemi3!=df$hemi_ants & df$region3==df$region_ants] <- "contralateral"
df$roipair[df$region3!=df$region_ants] <- "cross"

df$Z <- atanh(df$rho)

checks_fs5.3ants <- df %>%
  filter(hemi3 %in% c('L','R'), hemi_ants %in% c('L','R'), !is.na(rho)) %>%
  group_by(region3, hemi3) %>%
  mutate(popZ = as.numeric(scale(Z)),
         rankZ = as.numeric(rank(Z),ties.method = "first")/n())

kable(select(filter(checks_fs5.3ants,roipair=="same"), region3, hemi3, rho, popZ, rankZ),
      caption = "Comparison of Freesurfer 5.3 to ANTS")
```

Table 6: Comparison of Freesurfer 5.3 to ANTS

region3	hemi3	rho	popZ	rankZ
caudalanteriorcingulate	L	0.2094435	1.4826871	0.9090909
caudalmiddlefrontal	L	0.5395686	2.3576352	1.0000000
cuneus	L	0.5741928	2.8895465	1.0000000
entorhinal	L	0.3845368	1.5265038	0.9545455
fusiform	L	0.3657561	0.4697851	0.6931818
inferiorparietal	L	0.5047017	2.0115307	1.0000000
inferiortemporal	L	0.3388892	0.2561540	0.6250000
isthmuscingulate	L	0.3054623	1.7887582	0.8977273
lateraloccipital	L	0.3577505	1.0381530	0.8181818
lateralorbitofrontal	L	0.4602697	1.7778615	0.9772727
lingual	L	0.4956377	2.0726760	0.9545455
medialorbitofrontal	L	0.3088465	1.2860036	0.9090909
middletemporal	L	0.5491394	2.1714234	0.9886364
parahippocampal	L	0.6272843	4.0208884	1.0000000
paracentral	L	0.6085769	2.8309325	1.0000000
parsopercularis	L	0.5183139	1.9520872	0.9772727
parsorbitalis	L	0.4773544	1.8706944	0.9772727
parstriangularis	L	0.5669626	2.5643830	1.0000000
pericalcarine	L	0.4654477	2.6585260	1.0000000
postcentral	L	0.4772065	1.9502265	0.9772727
posteriorcingulate	L	0.2792080	1.3557587	0.8863636
precentral	L	0.5913266	2.7822125	1.0000000
precuneus	L	0.5872341	2.5083745	1.0000000
rostralanteriorcingulate	L	0.2091735	0.7429913	0.7500000
rostralmiddlefrontal	L	0.5896913	2.4927402	1.0000000
superiorfrontal	L	0.5642336	2.1870985	1.0000000
superiorparietal	L	0.4426648	1.6484566	0.9204545
superiortemporal	L	0.6308561	2.3344741	0.9886364
supramarginal	L	0.5722115	2.3757572	1.0000000
transversetemporal	L	0.4434101	1.9461312	1.0000000
insula	L	0.4565778	1.9485829	0.9772727
caudalanteriorcingulate	R	0.1871205	1.5296639	0.9431818
caudalmiddlefrontal	R	0.4067614	1.7322132	0.9545455
cuneus	R	0.5970522	2.9111149	1.0000000
entorhinal	R	0.3557165	1.3062621	0.8863636
fusiform	R	0.4733622	1.2382783	0.8863636

region3	hemi3	rho	popZ	rankZ
inferiorparietal	R	0.5209681	1.9821677	1.0000000
inferiortemporal	R	0.4100987	0.8529923	0.7840909
isthmuscingulate	R	0.2543520	1.4211329	0.8750000
lateraloccipital	R	0.4635403	1.7435956	0.9659091
lateralorbitofrontal	R	0.5930160	2.6338880	1.0000000
lingual	R	0.5095864	2.1716403	0.9886364
medialorbitofrontal	R	0.3780057	1.8924974	0.9886364
middletemporal	R	0.5957339	2.5073513	1.0000000
parahippocampal	R	0.5918372	3.3394498	1.0000000
paracentral	R	0.5843132	2.6061695	1.0000000
parsopercularis	R	0.4538626	1.9190202	0.9886364
parsorbitalis	R	0.5251925	2.1964015	0.9886364
parstriangularis	R	0.6093722	2.8031854	1.0000000
pericalcarine	R	0.4469092	2.5896498	0.9886364
postcentral	R	0.4770860	2.0360705	1.0000000
posteriorcingulate	R	0.2569285	1.2563009	0.8750000
precentral	R	0.5294188	2.4462003	0.9772727
precuneus	R	0.5453160	2.2008551	1.0000000
rostralanteriorcingulate	R	0.3216031	2.6991847	1.0000000
rostralmiddlefrontal	R	0.5859909	2.6315610	1.0000000
superiorfrontal	R	0.5782098	2.4003346	1.0000000
superiorparietal	R	0.5172040	2.1841724	1.0000000
superiortemporal	R	0.6743368	2.6822890	1.0000000
supramarginal	R	0.5786078	2.3044839	1.0000000
transversetemporal	R	0.4021224	1.9687978	1.0000000
insula	R	0.4855564	1.9351831	0.9772727

```
summary_report_fs5.3ants <- checks_fs5.3ants %>%
  filter(roipair == "same") %>%
  ungroup() %>%
  summarise(Mean = mean(rho),
            Min = min(rho),
            Max = max(rho))

kable(summary_report_fs5.3ants, caption = "Summary of Freesurfer 5.3 to ANTS comparsion")
```

Table 7: Summary of Freesurfer 5.3 to ANTS comparsion

Mean	Min	Max
0.4743727	0.1871205	0.6743368

```
kable(select(filter(checks_fs5.3ants,rankZ==1.0), region3, hemi3, region_ants, hemi_ants, rho, popZ, ra
      caption = "The most correlated region from ANTS for each ROI")
```

Table 8: The most correlated region from ANTS for each ROI

region3	hemi3	region_ants	hemi_ants	rho	popZ	rankZ
bankssts	L	middletemporal	L	0.4724111	2.184197	1
caudalanteriorcingulate	L	isthmuscingulate	R	0.3495686	2.892568	1
caudalmiddlefrontal	L	caudalmiddlefrontal	L	0.5395686	2.357635	1

region3	hemi3	region_ants	hemi_ants	rho	popZ	rankZ
cuneus	L	cuneus	L	0.5741928	2.889546	1
entorhinal	L	superiortemporal	R	0.4207837	1.848093	1
fusiform	L	isthmuscingulate	L	0.5447787	1.823733	1
inferiorparietal	L	inferiorparietal	L	0.5047017	2.011531	1
inferiortemporal	L	superiortemporal	R	0.5569974	1.883948	1
isthmuscingulate	L	precuneus	L	0.4261970	2.898766	1
lateraloccipital	L	cuneus	R	0.5597914	2.474343	1
lateralorbitofrontal	L	parstriangularis	R	0.4806486	1.939587	1
lingual	L	cuneus	R	0.5233440	2.273608	1
medialorbitofrontal	L	inferiorparietal	L	0.3695105	1.782404	1
middletemporal	L	superiortemporal	L	0.5632533	2.289444	1
parahippocampal	L	parahippocampal	L	0.6272843	4.020888	1
paracentral	L	paracentral	L	0.6085769	2.830932	1
parsopercularis	L	parstriangularis	L	0.5674499	2.316024	1
parsorbitalis	L	parstriangularis	L	0.5113004	2.124171	1
parstriangularis	L	parstriangularis	L	0.5669626	2.564383	1
pericalcarine	L	pericalcarine	L	0.4654477	2.658526	1
postcentral	L	paracentral	R	0.4934098	2.073555	1
posteriorcingulate	L	precuneus	L	0.4773323	2.952954	1
precentral	L	precentral	L	0.5913266	2.782212	1
precuneus	L	precuneus	L	0.5872341	2.508374	1
rostralanteriorcingulate	L	isthmuscingulate	L	0.3697407	2.546012	1
rostralmiddlefrontal	L	rostralmiddlefrontal	L	0.5896913	2.492740	1
superiorfrontal	L	superiorfrontal	L	0.5642336	2.187098	1
superiorparietal	L	paracentral	L	0.4919754	1.996974	1
superiortemporal	L	superiortemporal	R	0.6448259	2.457755	1
supramarginal	L	supramarginal	L	0.5722115	2.375757	1
frontalpole	L	rostralmiddlefrontal	L	0.4029488	2.230908	1
temporalpole	L	superiortemporal	R	0.5058216	2.276729	1
transversetemporal	L	transversetemporal	L	0.4434101	1.946131	1
insula	L	isthmuscingulate	L	0.4718986	2.085660	1
bankssts	R	middletemporal	R	0.4582472	2.006067	1
caudalanteriorcingulate	R	isthmuscingulate	R	0.2921776	2.743644	1
caudalmiddlefrontal	R	superiorfrontal	L	0.4266695	1.855999	1
cuneus	R	cuneus	R	0.5970522	2.911115	1
entorhinal	R	superiortemporal	R	0.4272084	1.931565	1
fusiform	R	lingual	R	0.5569576	1.877585	1
inferiorparietal	R	inferiorparietal	R	0.5209681	1.982168	1
inferiortemporal	R	superiortemporal	R	0.5711545	2.100686	1
isthmuscingulate	R	precuneus	L	0.4164757	2.818605	1
lateraloccipital	R	cuneus	R	0.5696601	2.544479	1
lateralorbitofrontal	R	lateralorbitofrontal	R	0.5930160	2.633888	1
lingual	R	cuneus	R	0.5460055	2.450118	1
medialorbitofrontal	R	rostralmiddlefrontal	R	0.4148550	2.174570	1
middletemporal	R	middletemporal	R	0.5957339	2.507351	1
parahippocampal	R	parahippocampal	R	0.5918372	3.339450	1
paracentral	R	paracentral	R	0.5843132	2.606170	1
parsopercularis	R	parstriangularis	R	0.5001274	2.290142	1
parsorbitalis	R	parstriangularis	R	0.5541109	2.418488	1
parstriangularis	R	parstriangularis	R	0.6093722	2.803185	1
pericalcarine	R	pericalcarine	L	0.4849361	2.878502	1
postcentral	R	postcentral	R	0.4770860	2.036071	1

region3	hemi3	region_ants	hemi_ants	rho	popZ	rankZ
posteriorcingulate	R	precuneus	L	0.4463705	2.850497	1
precentral	R	paracentral	R	0.5371172	2.508815	1
precuneus	R	precuneus	R	0.5453160	2.200855	1
rostralanteriorcingulate	R	rostralanteriorcingulate	R	0.3216031	2.699185	1
rostralmiddlefrontal	R	rostralmiddlefrontal	R	0.5859909	2.631561	1
superiorfrontal	R	superiorfrontal	R	0.5782098	2.400335	1
superiorparietal	R	superiorparietal	R	0.5172040	2.184172	1
superiortemporal	R	superiortemporal	R	0.6743368	2.682289	1
supramarginal	R	supramarginal	R	0.5786078	2.304484	1
frontalpole	R	superiorfrontal	R	0.3501968	2.054076	1
temporalpole	R	superiortemporal	R	0.4892664	2.288988	1
transversetemporal	R	transversetemporal	R	0.4021224	1.968798	1
insula	R	isthmuscingulate	L	0.5303494	2.314678	1