

Packages

```
library(lme4)
library(lmerTest)
library(tidyverse)
library(readr)
library(scales)
library(Rmisc)
library(ggplot2)
library(plyr)
library(dplyr)
library(sjPlot)
library(Hmisc)
library(effects)
library(ggeffects)
library(corrplot)
library(ggpubr)
```

Between-group comparisons

```
contrasts(data$ROI) <- contr.sum(4)
mod <- lmer(density ~ 1 + Part/Group + (1 | ID), data = data,
           control = lmerControl(optimizer = "bobyqa"))
print(summary(mod))
```

Correction for multiple comparisons

```
p.adjust.methods = "fdr"
p = c() # the list of p-values in the model
p.adjust(p, method = p.adjust.methods, n = length(p))
```

Tables with models outcomes

```
tab_model(mod,
  pred.labels = c("Intercept", "SPL", "SMA", "vmPFC",
                 "dmPFC:TD_group", "SPL:TD_group",
                 "SMA:TD_group", "vmPFC:TD_group"),
  dv.labels = "Density",
  string.est = "Estimate",
  string.se = "Standard error",
  string.stat = "t",
  show.se = TRUE, show.ci = FALSE, collapse.ci = FALSE,
  show.stat = TRUE, show.est = TRUE)
```

Brain-behavior relationships

```
mod <- lm(FA_vmpfc ~ 1 + Age + L_Score + IQ + AQ_social +
          AQ_att_switching + AQ_imagination + AQ_commun + AQ_att_detail,
          data = data)
print(summary(mod))
```

Correction for multiple comparisons

```
p.adjust.methods = "fdr"
p = c() # the list of p-values in the model
p.adjust(p, method = p.adjust.methods, n = length(p))
```

Figure 2 (FA)

```
mod <- summarySE(data, measurevar = "FA", groupvars = c("Group", "Corpus.callosum"),
                 conf.interval = 0.95, na.rm = TRUE)
mod
```

```
ggplot(data, aes(x = Corpus.callosum, y = FA, fill = Group)) +
  geom_boxplot(width = 0.8, outlier.shape = NA) +
  scale_y_continuous(name = "Fractional anisotropy (FA)",
                     breaks = seq(0.35, 0.60, 0.05),
                     limits = c(0.35, 0.60)) +
  scale_x_discrete(name = "Corpus.callosum") +
  theme_bw(base_size = 17) +
  theme(panel.grid.major = element_blank(),
        panel.grid.minor = element_blank(),
        panel.background = element_blank()) +
  theme(axis.text = element_text(size = 14, colour = "black"),
        axis.title = element_text(size = 20)) +
  theme(axis.title.x = element_blank()) +
  theme(axis.title.y = element_text(margin = margin(t = 0, r = 10, b = 0, l = 0))) +
  scale_fill_manual(values = c("blue1", "red1"))
ggsave("Fig2a.png", width = 7, height = 5)
```

Figure 2 (Volume)

```
mod <- summarySE(data, measurevar = "Volume", groupvars = c("Group",
"Corpus.callosum"),
                 conf.interval = 0.95, na.rm = TRUE)
mod
```

```
ggplot(data, aes(x = Corpus.callosum, y = Volume, fill = Group)) +
```

```

geom_boxplot(width = 0.8, outlier.shape = NA) +
scale_y_continuous(name = "Volume, ml",
  breaks = seq(4000, 70000, 10000),
  limits = c(4000, 70000)) +
scale_x_discrete(name = "Corpus.callosum") +
theme_bw(base_size = 17) +
theme(panel.grid.major = element_blank(),
  panel.grid.minor = element_blank(),
  panel.background = element_blank()) +
theme(axis.text = element_text(size = 14, colour = "black"),
  axis.title = element_text(size = 20)) +
theme(axis.title.x = element_blank()) +
theme(axis.title.y = element_text(margin = margin(t = 0, r = 10, b = 0, l = 0))) +
scale_fill_manual(values = c("blue1", "red1"))
ggsave("Fig2b.png", width = 7, height = 5)

```

Figure 2 (AD)

```

mod <- summarySE(data, measurevar = "AD", groupvars = c("Group", "Corpus.callosum"),
  conf.interval = 0.95, na.rm = TRUE)
mod

```

```

ggplot(data, aes(x = Corpus.callosum, y = AD, fill = Group)) +
geom_boxplot(width = 0.8, outlier.shape = NA) +
scale_y_continuous(name = "Axial diffusivity (AD)",
  breaks = seq(0.0011, 0.0016, 0.0001),
  limits = c(0.0011, 0.0016)) +
scale_x_discrete(name = "Corpus.callosum") +
theme_bw(base_size = 17) +
theme(panel.grid.major = element_blank(),
  panel.grid.minor = element_blank(),
  panel.background = element_blank()) +
theme(axis.text = element_text(size = 14, colour = "black"),
  axis.title = element_text(size = 20)) +
theme(axis.title.x = element_blank()) +
theme(axis.title.y = element_text(margin = margin(t = 0, r = 10, b = 0, l = 0))) +
scale_fill_manual(values = c("blue1", "red1"))
ggsave("Fig2c.png", width = 7, height = 5)

```

Figure 2 (MD)

```

mod <- summarySE(ASD, measurevar = "MD", groupvars = c("Group", "Corpus.callosum"),
  conf.interval = 0.95, na.rm = TRUE)
mod

```

```

ggplot(data, aes(x = Corpus.callosum, y = MD, fill = Group)) +
  geom_boxplot(width = 0.8, outlier.shape = NA) +
  scale_y_continuous(name = "Mean diffusivity (MD)",
    breaks = seq(0.00075, 0.00095, 0.00005),
    limits = c(0.00075, 0.00095)) +
  scale_x_discrete(name = "Corpus.callosum") +
  theme_bw(base_size = 17) +
  theme(panel.grid.major = element_blank(),
    panel.grid.minor = element_blank(),
    panel.background = element_blank()) +
  theme(axis.text = element_text(size = 14, colour = "black"),
    axis.title = element_text(size = 20)) +
  theme(axis.title.x = element_blank()) +
  theme(axis.title.y = element_text(margin = margin(t = 0, r = 10, b = 0, l = 0))) +
  scale_fill_manual(values = c("blue1", "red1"))
ggsave("Fig2d.png", width = 7, height = 5)

```

Figure 2 (Fiber density)

```

mod <- summarySE(data, measurevar = "Fiber.density", groupvars = c("Group",
  "Corpus.callosum"),
  conf.interval = 0.95, na.rm = TRUE)
mod

```

```

ggplot(data, aes(x = Corpus.callosum, y = Fiber.density, fill = Group)) +
  geom_boxplot(width = 0.8, outlier.shape = NA) +
  scale_y_continuous(name = "Fiber Density",
    breaks = seq(50, 300, 50),
    limits = c(50, 300)) +
  scale_x_discrete(name = "Corpus.callosum") +
  theme_bw(base_size = 17) +
  theme(panel.grid.major = element_blank(),
    panel.grid.minor = element_blank(),
    panel.background = element_blank()) +
  theme(axis.text = element_text(size = 14, colour = "black"),
    axis.title = element_text(size = 20)) +
  theme(axis.title.x = element_blank()) +
  theme(axis.title.y = element_text(margin = margin(t = 0, r = 10, b = 0, l = 0))) +
  scale_fill_manual(values = c("blue1", "red1"))
ggsave("Fig2e.png", width = 7, height = 5)

```