**Bayesian Meta-analysis ECPR – All rhythms**

library(brms)

#PRIORS

#VAGUE PRIOR

priors <- c(prior(normal(0,2), class = Intercept),

prior(cauchy(0,0.5), class = sd))

#META-ANALYSIS Log RR

m.brm <- brm(TE|se(seTE) ~ 1 + (1|Author),

data = ecprall,

prior = priors,

iter = 10000)

summary(m.brm)

pp\_check(m.brm)

ranef(m.brm)

post.samples <- posterior\_samples(m.brm, c("^b", "^sd"))

names(post.samples)

names(post.samples) <- c("logRR", "tau")

#PLOT POSTERIOR DISTRIBUTION TE

ggplot(aes(x = logRR), data = post.samples) +

geom\_density(fill = "lightblue",

color = "lightblue", alpha = 0.7) +

geom\_point(y = 0,

x = mean(post.samples$logRR)) +

labs(x = expression(italic(logRR)),

y = element\_blank()) +

theme\_minimal()

#PLOT POSTERIOR DISTRIBUTION TAU

ggplot(aes(x = tau), data = post.samples) +

geom\_density(fill = "lightgreen",

color = "lightgreen", alpha = 0.7) +

geom\_point(y = 0,

x = mean(post.samples$tau)) +

labs(x = expression(tau),

y = element\_blank()) +

theme\_minimal()

#POSTERIOR DISTRIBUTION

smd.ecdf <- ecdf(post.samples$logRR)

smd.ecdf(0)

smd.ecdf <- ecdf(post.samples$logRR)

smd.ecdf(0.24)

smd.ecdf <- ecdf(post.samples$logRR)

smd.ecdf(0.4336)

smd.ecdf <- ecdf(post.samples$logRR)

smd.ecdf(0.5957)

smd.ecdf <- ecdf(post.samples$logRR)

smd.ecdf(0.7351)

#FIGURE

library(tidybayes)

library(dplyr)

library(ggplot2)

library(ggridges)

library(glue)

library(stringr)

library(forcats)

study.draws <- spread\_draws(m.brm, r\_Author[Author,], b\_Intercept) %>%

mutate(b\_Intercept = r\_Author + b\_Intercept, type = "Study-level Estimate")

pooled.effect.draws <- spread\_draws(m.brm, b\_Intercept) %>%

mutate(Author = "Pooled Effect", type = "Pooled Estimate")

fp\_data <- bind\_rows(study.draws, pooled.effect.draws) %>%

ungroup() %>%

mutate(b\_Intercept = b\_Intercept %>% exp) %>%

mutate(Author = str\_replace\_all(Author, "[.]", " ")) %>%

mutate(Author = reorder(Author, b\_Intercept))

#CREATE TITLE AND SUBTITLES FOR THE PLOT

main\_title <- "A. All Rhythms"

subtitle <- "Literature-based prior"

#PLOT

ggplot(data = fp\_data,

aes(y = relevel(Author, "Pooled Effect"),

x = b\_Intercept,

fill = type

)) +

#Add Density plots

geom\_density\_ridges(col = NA,

scale = 0.9, #Slightly decrease size so it fits

alpha = 0.7,

) +

geom\_vline(xintercept = 1, color = "black",

lwd = 1, linetype = 2) +

stat\_halfeye(alpha = 0.7, .width = 0.95) +

#Set colors

scale\_fill\_manual(values = c("salmon", "lightblue")) +

#Create title

ggtitle(main\_title,

subtitle = subtitle) +

#X and Y axes aesthetics

scale\_y\_discrete(name = "Study") +

scale\_x\_continuous(name = "Relative Risk",

trans = "log",

breaks = c(0.5, 1, 2, 3, 4)) +

#Set reasonable Y axis limits

coord\_cartesian(xlim = c(0.5, 4)) +

#Set theme

theme\_pubclean() +

theme(text = element\_text(size = 23),

plot.title=element\_text(face = "bold",hjust = 0.0, size = 18),

plot.subtitle = element\_text(face = "bold", size = 15, hjust = 0.0, color = "grey45"),

axis.text.x = element\_text(size = 20, face = "bold"),

axis.text.y = element\_text(size = 15, face = "bold"),

axis.title.x = element\_text(size = 25, face = "bold"),

axis.title.y = element\_blank(),

axis.line = element\_line(colour = "black", linewidth = 1.2),

plot.margin = margin(0.5, 1, 0.5, 1, "cm"),

legend.background = element\_rect(fill = "transparent"),

legend.position = "none",

legend.text = element\_text(size = 12, face = "bold"),

legend.key.width = unit(1.5, "cm"),

legend.key.height = unit(0.75, "cm"))

**Bayesian Meta-analysis ECPR – Shockable rhythms**

library(brms)

#PRIORS

#VAGUE PRIOR

priors <- c(prior(normal(0,2), class = Intercept),

prior(cauchy(0,0.5), class = sd))

#META-ANALYSIS Log RR

m.brm <- brm(TE|se(seTE) ~ 1 + (1|Author),

data = ecprshock,

prior = priors,

iter = 10000)

summary(m.brm)

pp\_check(m.brm)

ranef(m.brm)

post.samples <- posterior\_samples(m.brm, c("^b", "^sd"))

names(post.samples)

names(post.samples) <- c("logRR", "tau")

#PLOT POSTERIOR DISTRIBUTION TE

ggplot(aes(x = logRR), data = post.samples) +

geom\_density(fill = "lightblue",

color = "lightblue", alpha = 0.7) +

geom\_point(y = 0,

x = mean(post.samples$logRR)) +

labs(x = expression(italic(logRR)),

y = element\_blank()) +

theme\_minimal()

#PLOT POSTERIOR DISTRIBUTION TAU

ggplot(aes(x = tau), data = post.samples) +

geom\_density(fill = "lightgreen",

color = "lightgreen", alpha = 0.7) +

geom\_point(y = 0,

x = mean(post.samples$tau)) +

labs(x = expression(tau),

y = element\_blank()) +

theme\_minimal()

#POSTERIOR DISTRIBUTION

smd.ecdf <- ecdf(post.samples$logRR)

smd.ecdf(0)

smd.ecdf <- ecdf(post.samples$logRR)

smd.ecdf(0.2239)

smd.ecdf <- ecdf(post.samples$logRR)

smd.ecdf(0.4067)

smd.ecdf <- ecdf(post.samples$logRR)

smd.ecdf(0.5609)

smd.ecdf <- ecdf(post.samples$logRR)

smd.ecdf(0.6951)

library(tidybayes)

library(dplyr)

library(ggplot2)

library(ggridges)

library(glue)

library(stringr)

library(forcats)

study.draws <- spread\_draws(m.brm, r\_Author[Author,], b\_Intercept) %>%

mutate(b\_Intercept = r\_Author + b\_Intercept, type = "Study-level Estimate")

pooled.effect.draws <- spread\_draws(m.brm, b\_Intercept) %>%

mutate(Author = "Pooled Effect", type = "Pooled Estimate")

fp\_data <- bind\_rows(study.draws, pooled.effect.draws) %>%

ungroup() %>%

mutate(b\_Intercept = b\_Intercept %>% exp) %>%

mutate(Author = str\_replace\_all(Author, "[.]", " ")) %>%

mutate(Author = reorder(Author, b\_Intercept))

#CREATE TITLE AND SUBTITLES FOR THE PLOT

main\_title <- "B. Shockable Rhythms"

subtitle <- "Literature-based prior"

#PLOT

ggplot(data = fp\_data,

aes(y = relevel(Author, "Pooled Effect"),

x = b\_Intercept,

fill = type

)) +

#Add Density plots

geom\_density\_ridges(col = NA,

scale = 0.9, #Slightly decrease size so it fits

alpha = 0.7,

) +

geom\_vline(xintercept = 1, color = "black",

lwd = 1, linetype = 2) +

stat\_halfeye(alpha = 0.7, .width = 0.95) +

#Set colors

scale\_fill\_manual(values = c("salmon", "lightblue")) +

#Create title

ggtitle(main\_title,

subtitle = subtitle) +

#X and Y axes aesthetics

scale\_y\_discrete(name = "Study") +

scale\_x\_continuous(name = "Relative Risk",

trans = "log",

breaks = c(0.5, 1, 2, 3, 4)) +

#Set reasonable Y axis limits

coord\_cartesian(xlim = c(0.5, 4)) +

#Set theme

theme\_pubclean() +

theme(text = element\_text(size = 23),

plot.title=element\_text(face = "bold",hjust = 0.0, size = 18),

plot.subtitle = element\_text(face = "bold", size = 15, hjust = 0.0, color = "grey45"),

axis.text.x = element\_text(size = 20, face = "bold"),

axis.text.y = element\_text(size = 15, face = "bold"),

axis.title.x = element\_text(size = 25, face = "bold"),

axis.title.y = element\_blank(),

axis.line = element\_line(colour = "black", linewidth = 1.2),

plot.margin = margin(0.5, 1, 0.5, 1, "cm"),

legend.background = element\_rect(fill = "transparent"),

legend.position = "none",

legend.text = element\_text(size = 12, face = "bold"),

legend.key.width = unit(1.5, "cm"),

legend.key.height = unit(0.75, "cm"))