Prior Distributions

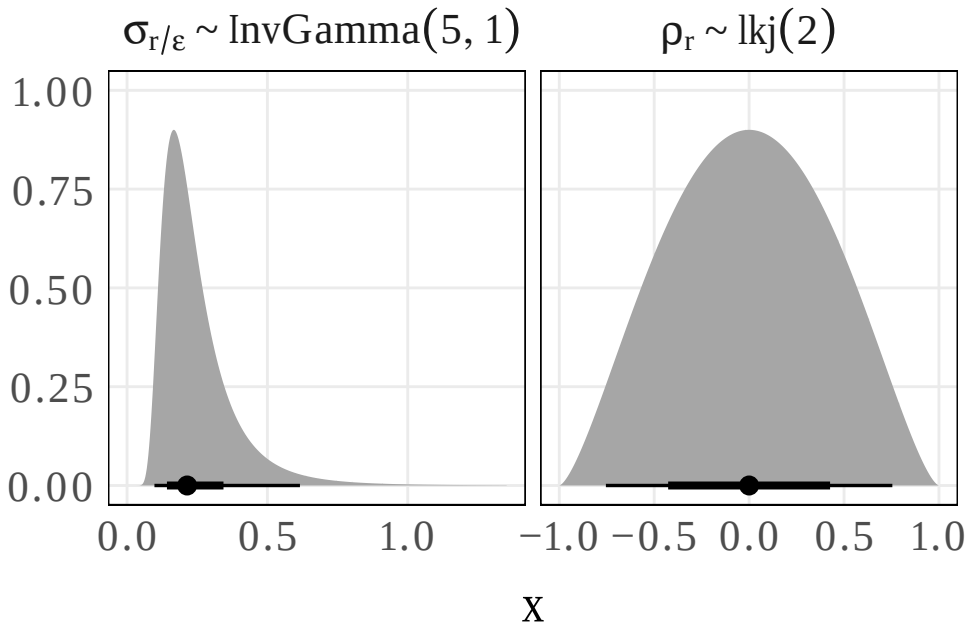
2024-07-05

```
# Packages
library(tidyverse)
library(ggdist)
library(extrafont)
library(distributional)
```

```
# Plot colors
clrs <- c("#54AA8F","#00335B",
          "#22A884FF","#414487FF",
          "#496aa2","#e46c0a","#90b6d4")


# ggplot theme
theme_nice <- function(){
  theme_minimal(base_family = "Jost") +
    theme(plot.title       = element_text(hjust = 0.5,size = 20),
          panel.grid.minor = element_blank(),
          text             = element_text(size  = 20),
          panel.border     = element_rect(colour = "black", linewidth = 0.5, fill = NA),
          axis.title.x     = element_text(margin = unit(c(3, 0, 0, 0), "mm")),
          axis.title.y     = element_text(margin = unit(c(3, 3, 0, 0), "mm"), angle = 90),
          legend.title     = element_text(face = "bold",size=16),
          strip.text       = element_text(face = "bold"),
          legend.position  = "bottom"
    )}
```

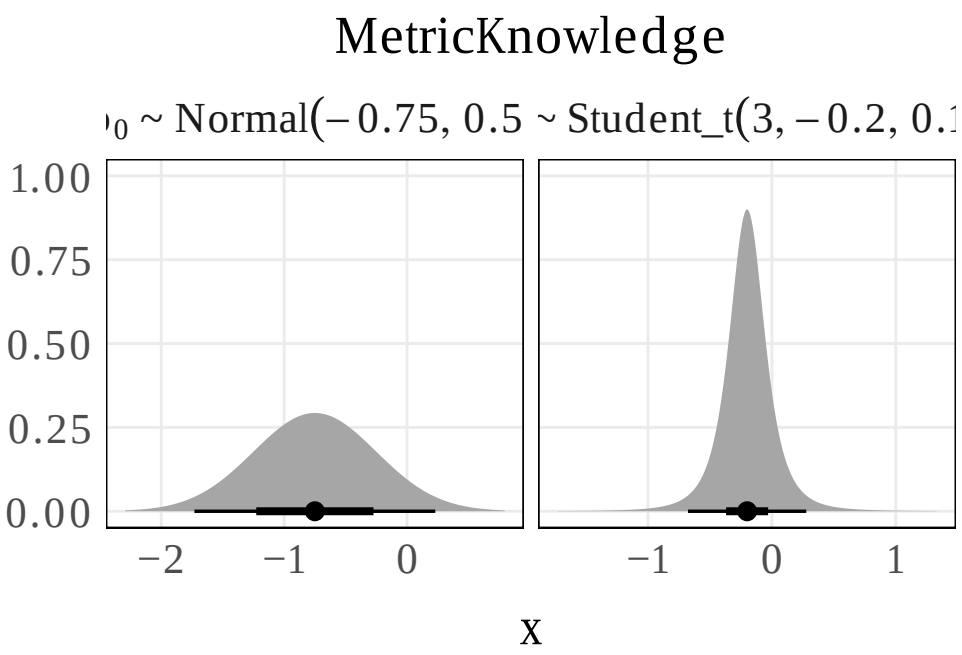
General

```
dist_1 <- tibble(
  dist      = dist_inverse_gamma(5,1),
  dist_name = "~sigma[r/epsilon] %~% InvGamma(5,1)")

dist_2 <- tibble(
  dist      = "lkjcorr_marginal",
  dist_name = "rho[r] %~% lkj(2)")

ggplot() +
  stat_halfeye(data = dist_1,aes(xdist = dist)) +
  stat_halfeye(data = dist_2,aes(xdist = dist, arg1 = 3, arg2 = 2)) +
  facet_grid(.~dist_name, scales="free", labeller = label_parsed) +
  theme_nice() +
  labs(y = "")
```



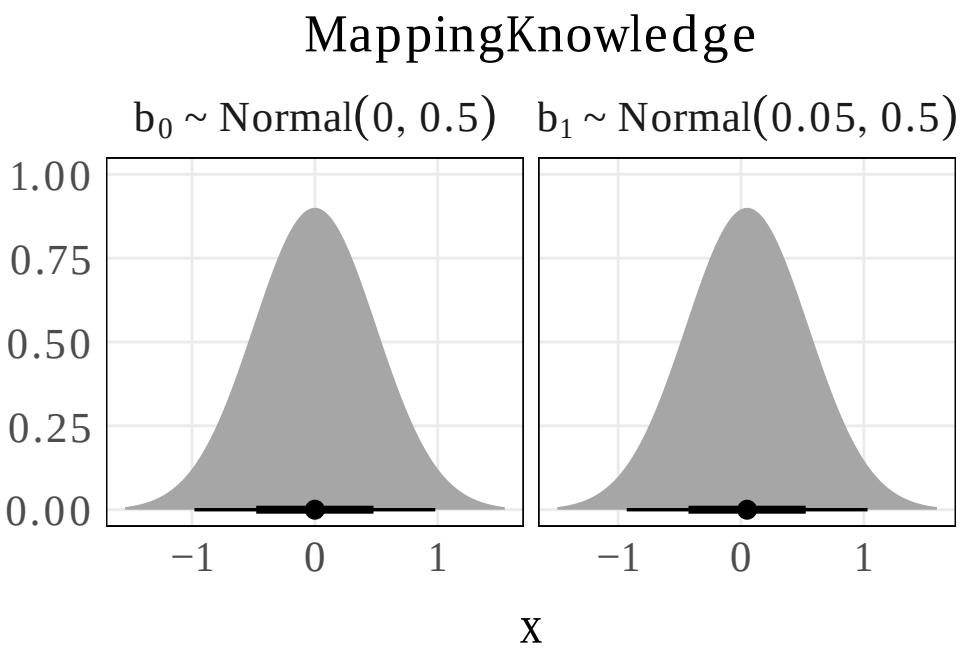
Hypothesis 1

```
dist_df <- tibble(
  dist      = c(dist_normal(-.75,.50), dist_student_t(3, -.20, .15)),
  dist_name = c("b[0] %~% Normal(-0.75,0.50)",
                "b[1] %~% Student_t(3, -0.20, 0.15)")
)


ggplot(dist_df,aes(xdist = dist)) +
  stat_halfeye() +
  facet_grid(.~dist_name, scales="free", labeller = label_parsed) +
  theme_nice() +
  labs(y = "", title = "Metric Knowledge")
```



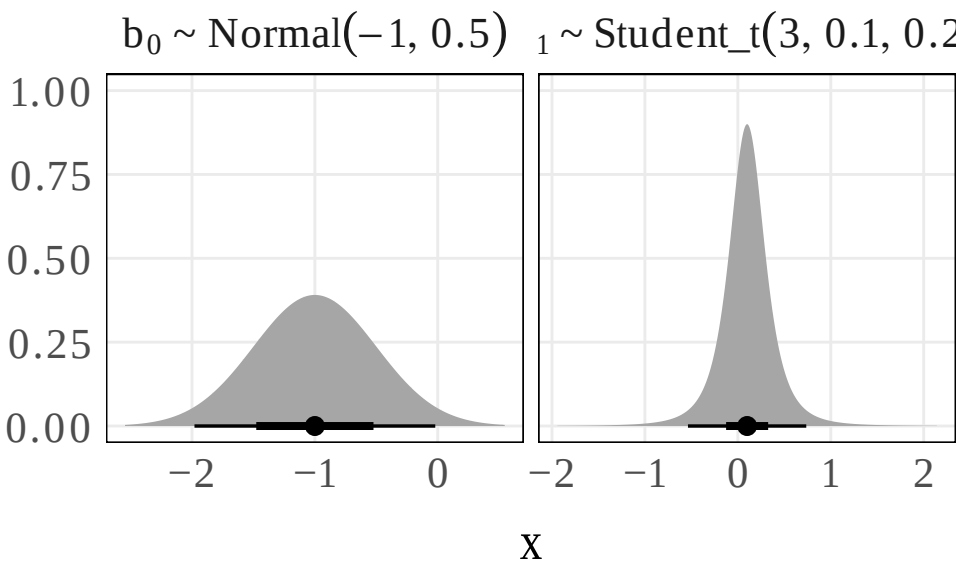

```
dist_df <- tibble(
  dist      = c(dist_normal(0,.50), dist_normal(0.05,.50)),
  dist_name = c("b[0] %~% Normal(0, 0.50)",
                "b[1] %~% Normal(0.05, 0.50)")
)
```

```
ggplot(dist_df,aes(xdist = dist)) +
  stat_halfeye() +
  facet_grid(.~dist_name, scales="free", labeller = label_parsed) +
  theme_nice() +
  labs(y = "", title = "Mapping Knowledge")
```

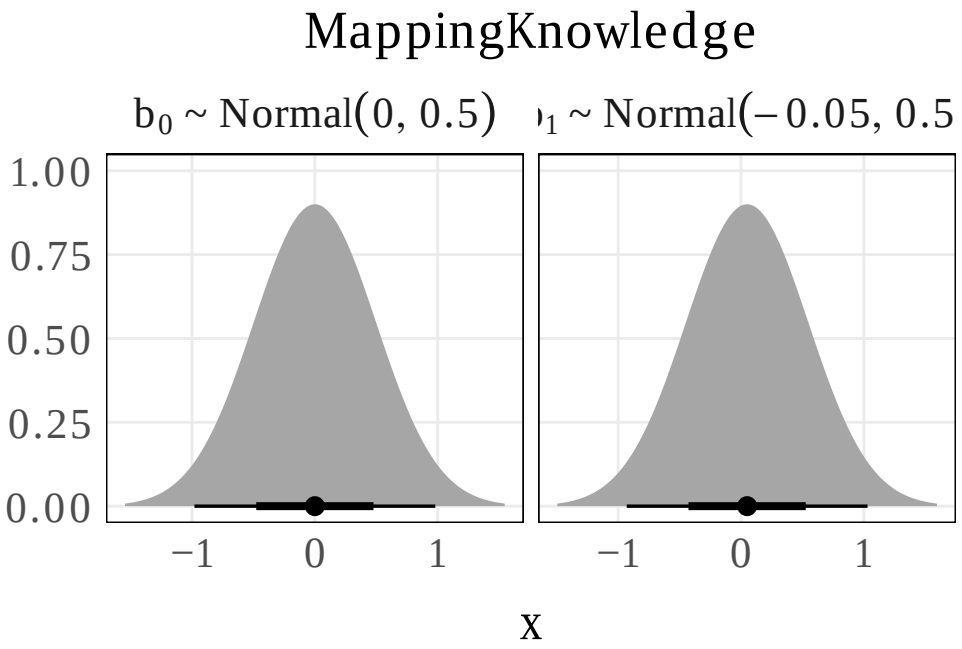


Hypothesis 2

```
dist_df <- tibble(
  dist      = c(dist_normal(-1,.50), dist_student_t(3, .10, .20)),
  dist_name = c("b[0] %~% Normal(-1.00,0.50)",
                "b[1] %~% Student_t(3, 0.10, 0.20)")
)


ggplot(dist_df,aes(xdist = dist)) +
  stat_halfeye() +
  facet_grid(.~dist_name, scales="free", labeller = label_parsed) +
  theme_nice() +
  labs(y = "", title = "Metric Knowledge")
```

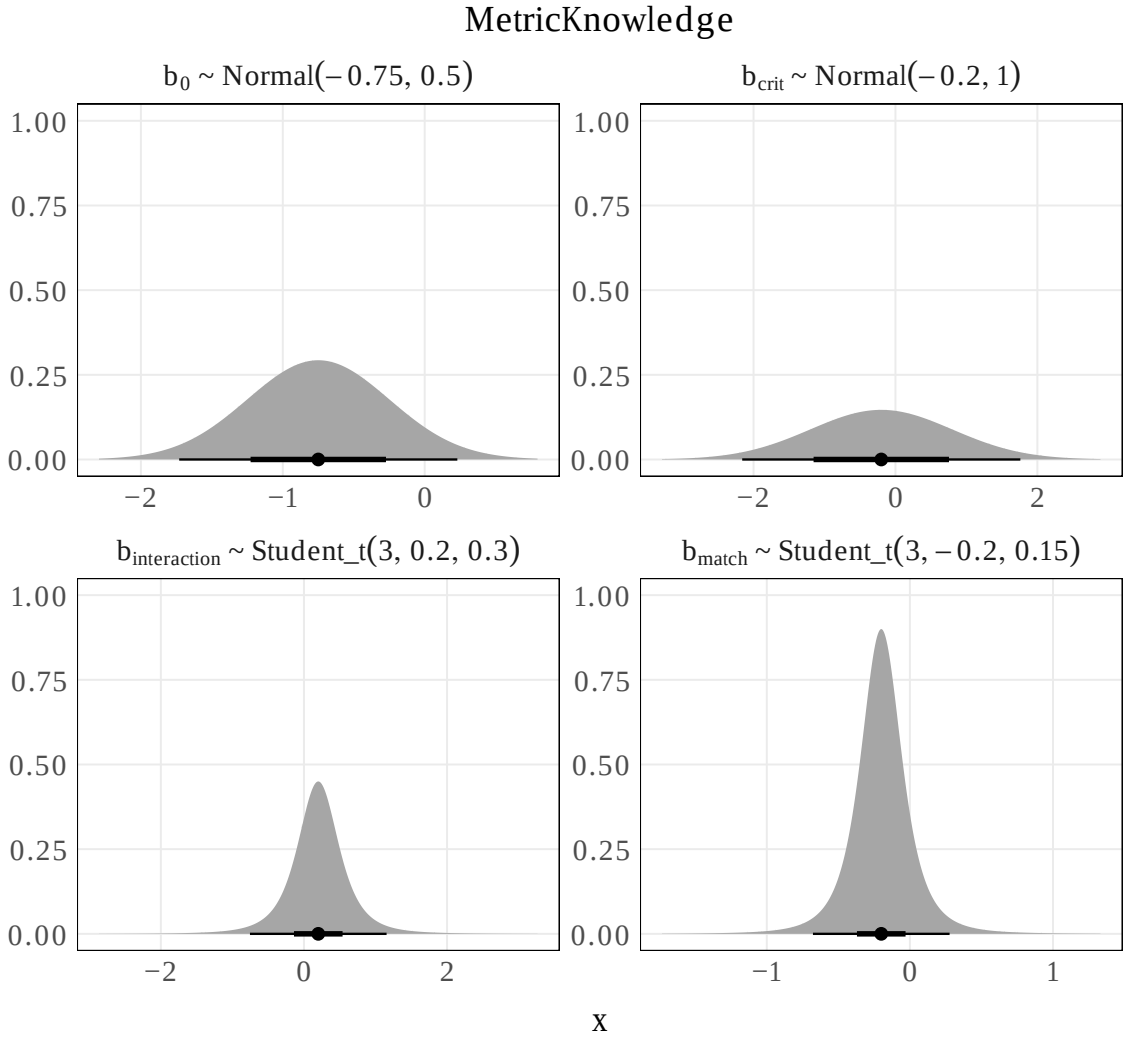



```
dist_df <- tibble(
  dist      = c(dist_normal(0,.50), dist_normal(0.05,.50)),
  dist_name = c("b[0] %~% Normal(0, 0.50)",
                "b[1] %~% Normal(-0.05, 0.50)")
)


ggplot(dist_df,aes(xdist = dist)) +
  stat_halfeye() +
  facet_grid(.~dist_name, scales="free", labeller = label_parsed) +
  theme_nice() +
  labs(y = "", title = "Mapping Knowledge")
```

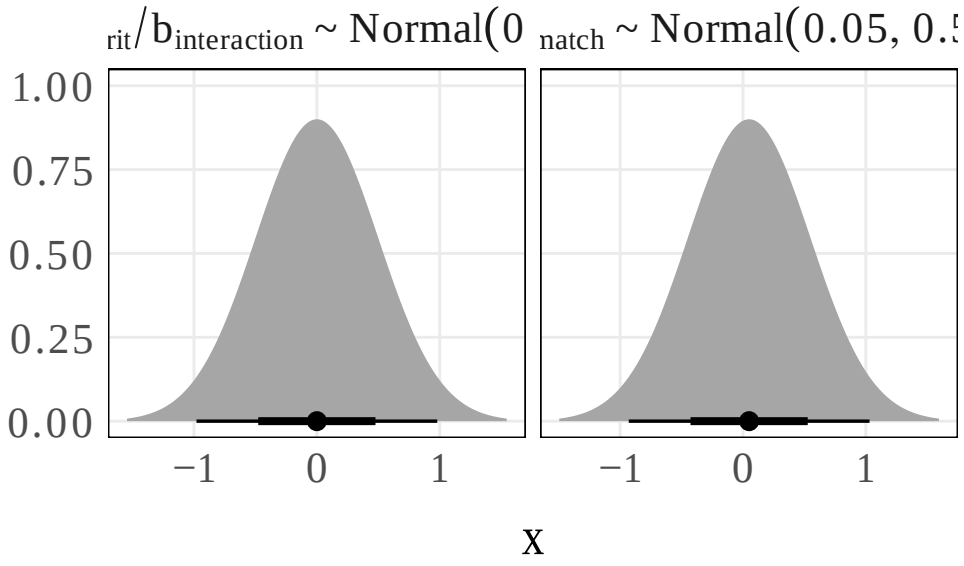


Hypothesis 3

```
dist_df <- tibble(
  dist      = c(dist_normal(-.75,.50), dist_student_t(3, -.20, .15),
                dist_normal(-.20,1.0), dist_student_t(3, .20, .30)),
  dist_name = c("b[0] %~% Normal(-0.75,0.50)",
                "b[match] %~% Student_t(3, -0.20, 0.15)",
                "b[crit] %~% Normal(-.20,1.0)",
                "b[interaction] %~% Student_t(3, .20, .30)")
)


ggplot(dist_df,aes(xdist = dist)) +
  stat_halfeye() +
  facet_wrap(.~dist_name, scales="free", labeller = label_parsed) +
  theme_nice() +
  labs(y = "", title = "Metric Knowledge")
```




```
dist_df <- tibble(
  dist      = c(dist_normal(0,.50), dist_normal(0.05,.50)),
  dist_name = c("b[0]/b[crit]/b[interaction] %~% Normal(0,.50)",
                "b[match] %~% Normal(0.05,.50)")
)


ggplot(dist_df,aes(xdist = dist)) +
  stat_halfeye() +
  facet_grid(.~dist_name, scales="free", labeller = label_parsed) +
  theme_nice() +
  labs(y = "", title = "Mapping Knowledge")
```


MappingKnowledge
rit/b interaction ~ Normal(0
natch ~ Normal(0.05, 0.
1.00
0.75
0.50
0.25
0.00
−1
0
1
−1
0
1
x