

Supplement

For the article #Knowledge: Improving food-related knowledge via seeding implemented as a social media intervention

2024-07-05

```
# Packages
library(tidyverse)    # ggplot, dplyr, and friends
library(brms)          # Bayesian modeling through Stan
library(psych)         # For describe()
library(correlation)   # For correlations with nicer output
library(patchwork)     # For combining plots
library(parameters)    # Nicer output of model results
library(tidybayes)     # Manipulate brms objects in a tidy way
library(scales)         # For formatting labels in ggplot
library(extrafont)      # to change ggplot font
library(kableExtra)    # for Latextables
library(papaja)         # better printing
library(bayestestR)     # for describe_posterior()
library(emmeans)        # for contrast()
library(BayesFactor)    # for ttestBF() and anovaBF()
```

```
# 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"
  )}

brms_plot <- function(mod, lim=c(0,5)){

  trace <- mcmc_trace(temp, type = "trace", variable = "^b_",
    regex = TRUE) +
    theme_nice() +
    labs(title = "Traceplot")

  pp     <- pp_check(temp, ndraws = 20) +
    theme_nice() + xlim(lim[1], lim[2]) +
    labs(title = "Posterior Predictive Check", color = "") +
    scale_color_manual(values = clrs[c(2,7)], labels = c("Observed", "Predicted"))

  return(trace + pp)

}

# load data
est <- read_csv2("../Data/df_analysis.csv")

```

Reactivity Effects in General Criterion Knowledge Question

```

# Make tidy df of needed variables
temp <- est %>%
  select(ID, trained_criterion, est_criterion, Kcal_knowledge, C02_knowledge) %>%
  distinct() %>%
  mutate(trained_f   = factor(trained_criterion),
         estimated_f = factor(est_criterion)) %>%
  as.data.frame()

```

Estimated Criterion	Knowledge: Kcal	Knowledge: CO2
CO2	4.55 (1.76)	1.86 (1.21)
Kcal	3.71 (1.52)	2.30 (1.40)

```
bf_Kcal = anovaBF(Kcal_knowledge ~ trained_f * estimated_f, data=temp)
bf_CO2 = anovaBF(CO2_knowledge ~ trained_f * estimated_f, data=temp)
```

As stated in the main manuscript, participants reported knowing in general more about the calorie content of food items ($M = 4.12$, $SD = 1.69$) than their CO₂ footprint ($M = 2.08$, $SD = 1.32$, $F = 2.02$ [1.67, 2.36], $BF_{10} > 1000$). However, we also found a small reactivity effect, where participants rated their knowledge of a criterion lower when they had to estimate this criterion beforehand. This effect was found when participants had to estimate calories in the main task ($BF_{10} = 11.71$) and also (but to smaller degree) when they had to estimate the carbon footprint ($BF_{10} = 1.15$). See below for descriptive values and the corresponding figure of individual values.

```
temp %>%
  group_by(est_criterion) %>%
  summarize(m_kcal = mean(Kcal_knowledge),
            sd_kcal = sd(Kcal_knowledge),
            m_CO2 = mean(CO2_knowledge),
            sd_CO2 = sd(CO2_knowledge)) %>%
  mutate("Knowledge: Kcal" = paste0(printnum(m_kcal), " (", printnum(sd_kcal), ")"),
        "Knowledge: CO2" = paste0(printnum(m_CO2), " (", printnum(sd_CO2), ")")) %>%
  select("Estimated Criterion" = est_criterion, `Knowledge: Kcal`, `Knowledge: CO2`) %>%
  kbl() %>%
  kable_paper()
```

```
temp %>%
  pivot_longer(cols      = c(Kcal_knowledge, CO2_knowledge),
               names_to  = "criterion",
               values_to = "values") %>%
  mutate(criterion = ifelse(criterion == "CO2_knowledge", "bold(Knowledge:~CO[2])", "bold(~Kcal[2])"),
         estimated_f = ifelse(estimated_f == "CO2", "CO[2]", "kcal")) %>%
  ggplot(aes(x = estimated_f, y = values, group = criterion)) +
  geom_jitter(width=0.1, height = 0.1) +
  stat_summary(fun.data = mean_se, geom = "errorbar", aes(color=criterion), width=0.1) +
  stat_summary(fun="mean", geom="line", lwd=0.8, aes(color=criterion)) +
  stat_summary(fun="mean", geom="point", size=4, aes(fill=criterion), shape=21) +
  scale_color_manual(values=c(clrs[4], clrs[3])) +
```

```

scale_fill_manual(values=c(clrs[4],clrs[3])) +
facet_wrap(. ~ criterion,labeller = label_parsed) +
theme_nice() +
scale_x_discrete(labels = parse_format()) +
scale_y_continuous(breaks = 1:7) +
labs(x = "Estimated Criterion",
y = "Knowledge Rating") +
theme(legend.position = "none")

```

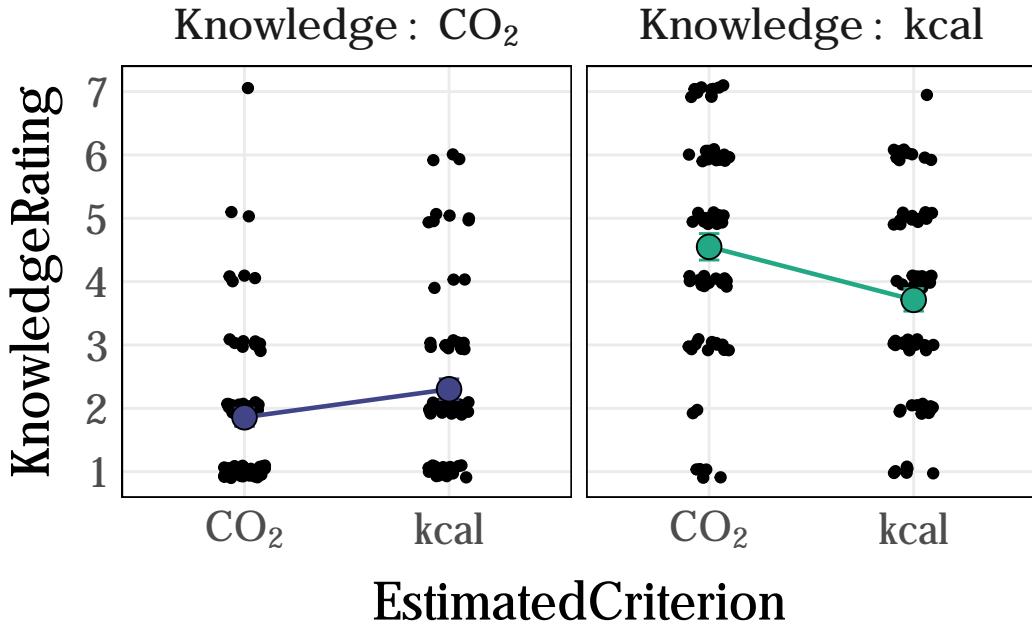


Figure 1: Figure S1. General knowledge ratings for C0₂ footprint and calorie content of food items, depending on the estimated criterion in the main task.

Detailed Modeling Results

Here we provide for all models reported in the main manuscript more detailed modeling results, including a table with the mean, standard deviation, 95%-HDI, effective sample size (ESS) and \hat{R} for each estimated parameter (random and fixed), as well as figures showing the MCMC-traces for the main fixed effects parameters (intercept and effect parameter) and posterior predictive distributions of the complete model.

Parameter	Effects	Component	Mean	SD	CI	CI_low	CI_high
b_Intercept	fixed	conditional	-0.63	0.10	0.95	-0.83	-0.43
sd_ID_Intercept	random	conditional	0.80	0.07	0.95	0.67	0.98
sd_ID_item_Intercept	random	conditional	0.33	0.03	0.95	0.26	0.40
sd_ID_item_match_domain	random	conditional	0.20	0.04	0.95	0.13	0.37
cor_ID_item_Intercept_match_domain	random	conditional	0.81	0.12	0.95	0.57	0.98
sigma	fixed	sigma	0.88	0.01	0.95	0.86	0.98

Hypothesis 1a (OME)

CO₂ M0

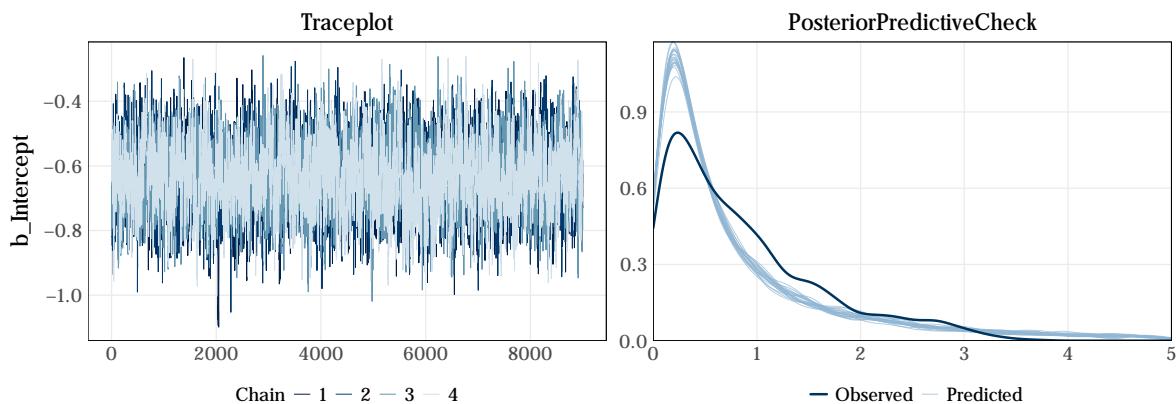
```
# Load model
temp <- brm(file="~/Results/fit_H1a_CO2_M0.rds")
```

```
# Print Formula
temp$formula
```

```
OME_corr ~ 1 + (1 | ID) + (match_domain | ID_item)
```

```
# Make model parameter table
model_parameters(temp, centrality = "mean", dispersion = TRUE,
                 ci_method = "hdi", effects = "all") %>%
  kable(digits=2) %>% kable_paper()
```

```
# Make trace and pp-check plot
brms_plot(temp)
```



Parameter	Effects	Component	Mean	SD	CI	CI_low	CI_high
b_Intercept	fixed	conditional	-0.68	0.09	0.95	-0.87	-0.49
b_match_domain	fixed	conditional	-0.67	0.18	0.95	-1.03	-0.31
sd_ID_Intercept	random	conditional	0.70	0.06	0.95	0.58	0.82
sd_ID_item_Intercept	random	conditional	0.33	0.03	0.95	0.26	0.40
sd_ID_item_match_domain	random	conditional	0.20	0.04	0.95	0.13	0.27
cor_ID_item_Intercept_match_domain	random	conditional	0.81	0.12	0.95	0.57	0.99
sigma	fixed	sigma	0.88	0.01	0.95	0.86	0.99

CO₂ M1

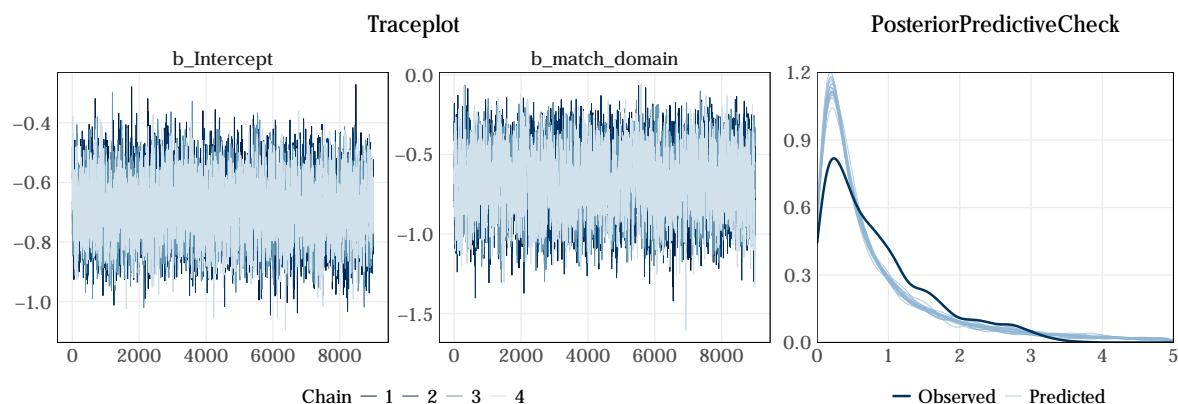
```
# Load model
temp <- brm(file = "../Results/fit_H1a_CO2_M1.rds")
```

```
# Print Formula
temp$formula
```

```
OME_corr ~ match_domain + (1 | ID) + (match_domain | ID_item)
```

```
# Make model parameter table
model_parameters(temp, centrality = "mean", dispersion = TRUE,
                ci_method = "hdi", effects = "all") %>%
  kable(digits=2) %>% kable_paper()
```

```
# Make trace and pp-check plot
brms_plot(temp) + plot_layout(widths = c(2, 1))
```



Parameter	Effects	Component	Mean	SD	CI	CI_low	CI_high
b_Intercept	fixed	conditional	-1.90	0.07	0.95	-2.04	-1.76
sd_ID_Intercept	random	conditional	0.44	0.04	0.95	0.36	0.53
sd_ID_item_Intercept	random	conditional	0.35	0.04	0.95	0.28	0.42
sd_ID_item_match_domain	random	conditional	0.13	0.03	0.95	0.07	0.20
cor_ID_item_Intercept_match_domain	random	conditional	0.08	0.35	0.95	-0.61	0.77
sigma	fixed	sigma	1.19	0.01	0.95	1.17	1.21

kcal M0

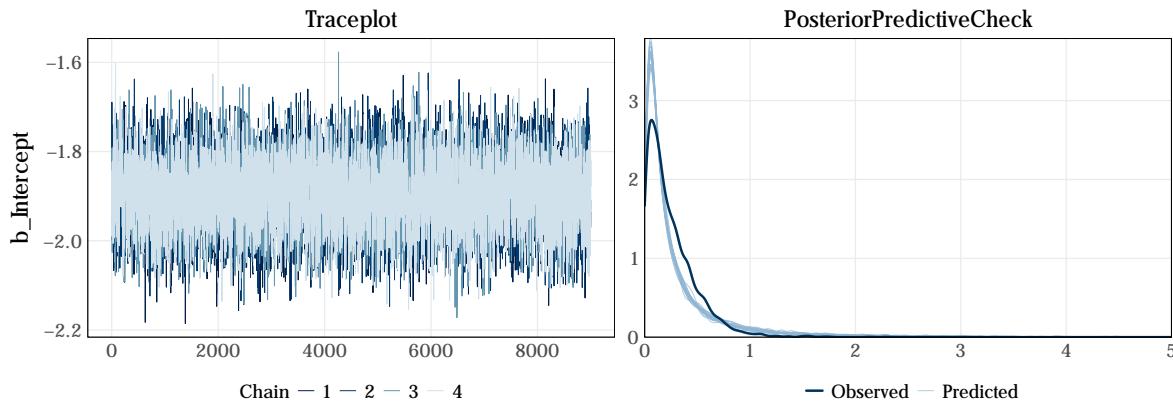
```
# Load model
temp <- brm(file="Results/fit_H1a_kcal_M0.rds")

# Print Formula
temp$formula

OME_corr ~ 1 + (1 | ID) + (match_domain | ID_item)

# Make model parameter table
model_parameters(temp, centrality = "mean", dispersion = TRUE,
                 ci_method = "hdi", effects = "all") %>%
  kable(digits=2) %>% kable_paper()

# Make trace and pp-check plot
brms_plot(temp)
```



Parameter	Effects	Component	Mean	SD	CI	CI_low	CI_high
b_Intercept	fixed	conditional	-1.90	0.07	0.95	-2.04	-1.76
b_match_domain	fixed	conditional	-0.19	0.09	0.95	-0.37	-0.01
sd_ID_Intercept	random	conditional	0.43	0.04	0.95	0.36	0.50
sd_ID_item_Intercept	random	conditional	0.35	0.04	0.95	0.27	0.43
sd_ID_item_match_domain	random	conditional	0.13	0.03	0.95	0.07	0.20
cor_ID_item_Intercept_match_domain	random	conditional	0.05	0.36	0.95	-0.64	0.74
sigma	fixed	sigma	1.19	0.02	0.95	1.17	1.21

kcal M1

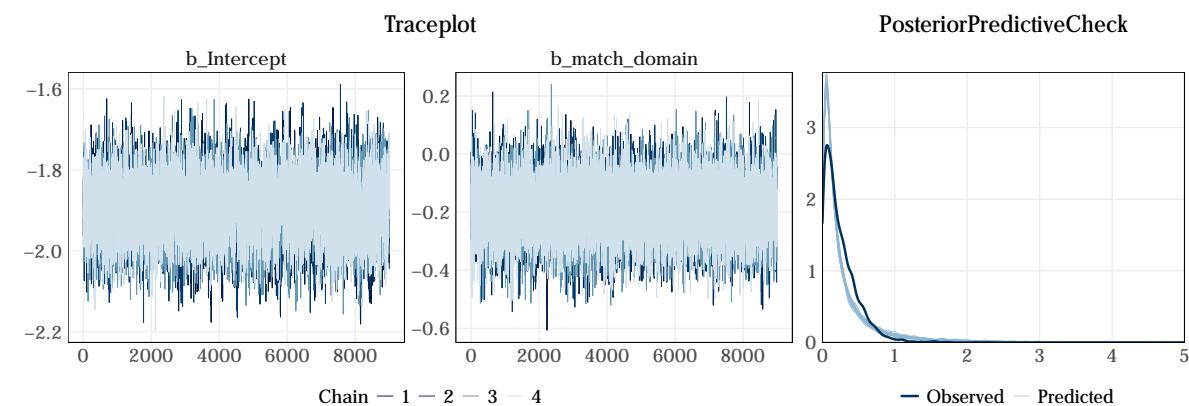
```
# Load model
temp <- brm(file = "../Results/fit_H1a_kcal_M1.rds")

# Print Formula
temp$formula
```

```
OME_corr ~ match_domain + (1 | ID) + (match_domain | ID_item)
```

```
# Make model parameter table
model_parameters(temp, centrality = "mean", dispersion = TRUE,
                 ci_method = "hdi", effects = "all") %>%
  kable(digits=2) %>% kable_paper()
```

```
# Make trace and pp-check plot
brms_plot(temp) + plot_layout(widths = c(2, 1))
```



Parameter	Effects	Component	Mean	SD	CI	CI_low	CI_high	pd	Rhat	ESS
b_Intercept	fixed	conditional	0.71	0.03	0.95	0.64	0.77	1	1	15250.74
sd_ID_Intercept	random	conditional	0.19	0.05	0.95	0.10	0.29	1	1	1795.40
sigma	fixed	sigma	0.19	0.05	0.95	0.10	0.28	1	1	1270.07

Hypothesis 1b (ρ)

CO₂ M0

```
# Load model
temp <- brm(file="../Results/fit_H1b_CO2_M0.rds")

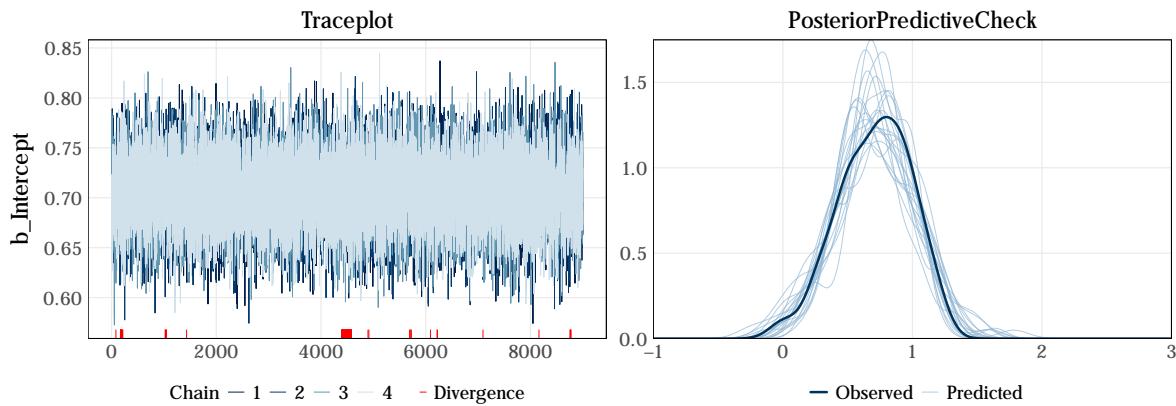
# Print Formular
temp$formula

rank_z ~ 1 + (1 | ID)

# Make model parameter table
model_parameters(temp, centrality = "mean", dispersion = TRUE,
                 ci_method = "hdi", effects = "all") %>%
  kable(digits=2) %>% kable_paper()
```

Make trace and pp-check plot

```
brms_plot(temp, lim=c(-1,3))
```



Parameter	Effects	Component	Mean	SD	CI	CI_low	CI_high	pd	Rhat	ES
b_Intercept	fixed	conditional	0.71	0.03	0.95	0.64	0.77	1.00	1	20663.1
b_match_domain	fixed	conditional	0.01	0.07	0.95	-0.12	0.14	0.55	1	20138.3
sd_ID_Intercept	random	conditional	0.19	0.05	0.95	0.10	0.28	1.00	1	2315.0
sigma	fixed	sigma	0.20	0.05	0.95	0.10	0.28	1.00	1	1868.1

CO₂ M1

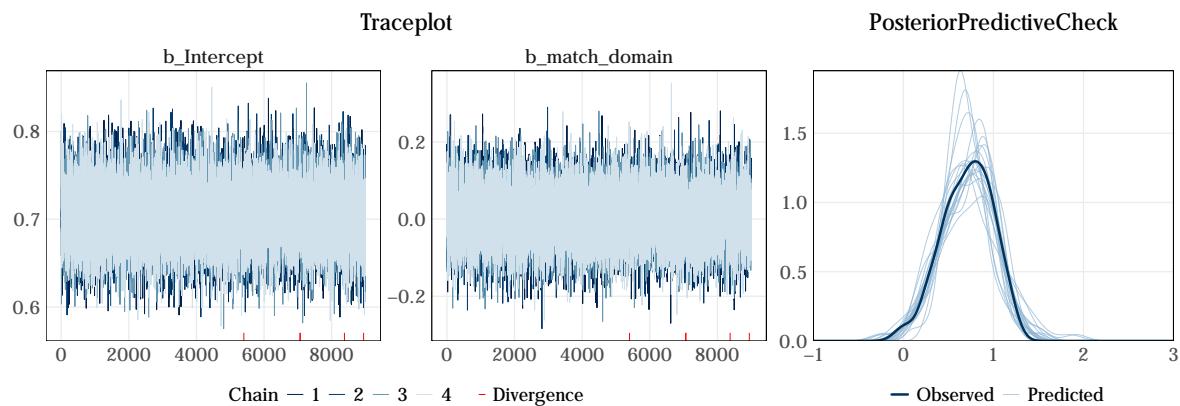
```
# Load model
temp <- brm(file = "../Results/fit_H1b_CO2_M1.rds")
```

```
# Print Formula
temp$formula
```

```
rank_z ~ match_domain + (1 | ID)
```

```
# Make model parameter table
model_parameters(temp, centrality = "mean", dispersion = TRUE,
                 ci_method = "hdi", effects = "all") %>%
  kable(digits=2) %>% kable_paper()
```

```
# Make trace and pp-check plot
brms_plot(temp, lim=c(-1,3)) + plot_layout(widths = c(2, 1))
```



Parameter	Effects	Component	Mean	SD	CI	CI_low	CI_high	pd	Rhat	ESS
b_Intercept	fixed	conditional	0.91	0.04	0.95	0.83	0.99	1	1	17139.45
sd_ID_Intercept	random	conditional	0.23	0.07	0.95	0.11	0.35	1	1	1609.94
sigma	fixed	sigma	0.24	0.07	0.95	0.11	0.35	1	1	1339.11

kcal M0

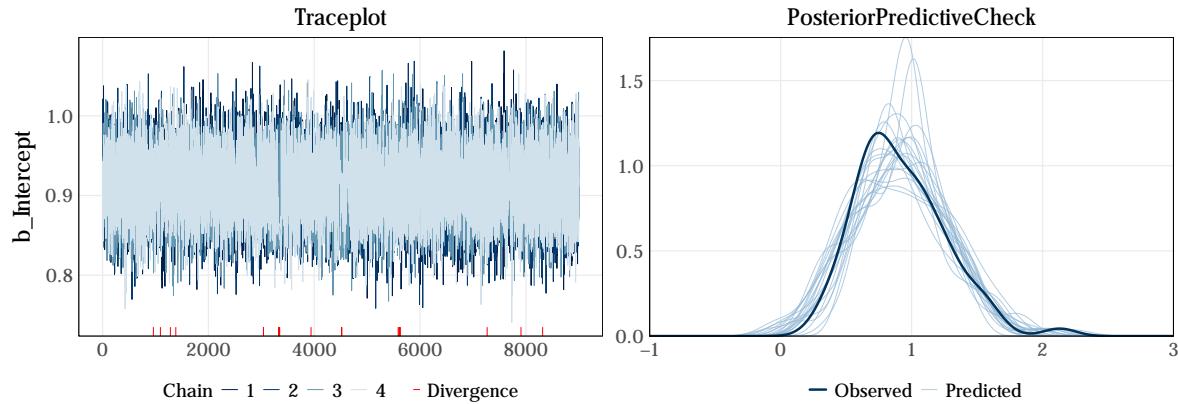
```
# Load model
temp <- brm(file="..../Results/fit_H1b_kcal_M0.rds")
```

```
# Print Formula
temp$formula
```

```
rank_z ~ 1 + (1 | ID)
```

```
# Make model parameter table
model_parameters(temp, centrality = "mean", dispersion = TRUE,
                 ci_method = "hdi", effects = "all") %>%
  kable(digits=2) %>% kable_paper()
```

```
# Make trace and pp-check plot
brms_plot(temp, lim=c(-1,3))
```



kcal M1

Parameter	Effects	Component	Mean	SD	CI	CI_low	CI_high	pd	Rhat	ES
b_Intercept	fixed	conditional	0.91	0.04	0.95	0.83	0.99	1.00	1	17275.0
b_match_domain	fixed	conditional	0.11	0.08	0.95	-0.05	0.26	0.92	1	15868.5
sd_ID_Intercept	random	conditional	0.23	0.07	0.95	0.11	0.35	1.00	1	1336.8
sigma	fixed	sigma	0.23	0.07	0.95	0.10	0.34	1.00	1	1003.8

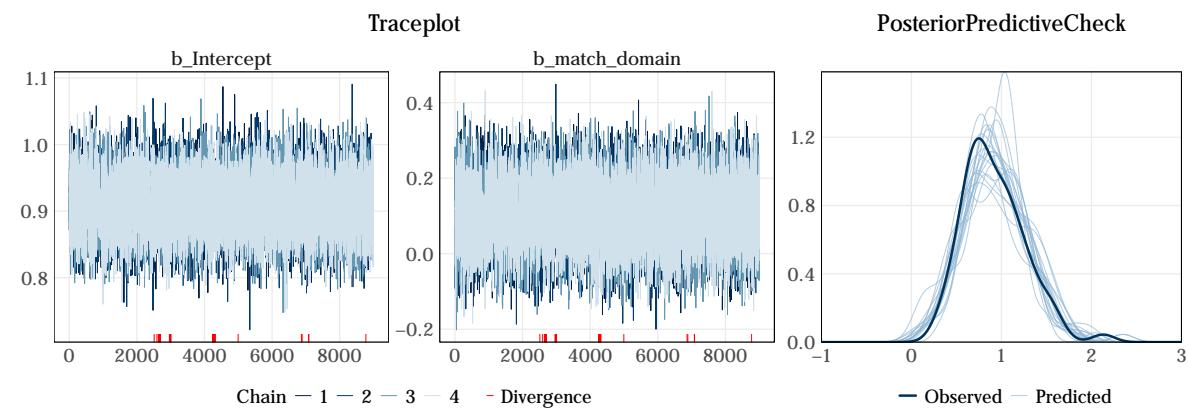
```
# Load model
temp <- brm(file="../Results/fit_H1b_kcal_M1.rds")
```

```
# Print Formular
temp$formula
```

```
rank_z ~ match_domain + (1 | ID)
```

```
# Make model parameter table
model_parameters(temp, centrality = "mean", dispersion = TRUE,
                 ci_method = "hdi", effects = "all") %>%
  kable(digits=2) %>% kable_paper()
```

```
# Make trace and pp-check plot
brms_plot(temp, lim=c(-1,3)) + plot_layout(widths = c(2, 1))
```



Parameter	Effects	Component	Mean	SD	CI	CI_low	CI_high	pd
b_Intercept	fixed	conditional	-1.13	0.10	0.95	-1.33	-0.93	1.00
sd_ID_Intercept	random	conditional	0.47	0.06	0.95	0.36	0.60	1.00
sd_ID_item_type	random	conditional	0.15	0.04	0.95	0.07	0.24	1.00
sd_ID_item_Intercept	random	conditional	0.43	0.05	0.95	0.34	0.52	1.00
cor_ID_Intercept_item_type	random	conditional	-0.14	0.33	0.95	-0.78	0.49	0.67
sigma	fixed	sigma	0.99	0.02	0.95	0.96	1.02	1.00

Hypothesis 2a (OME)

CO₂ M0

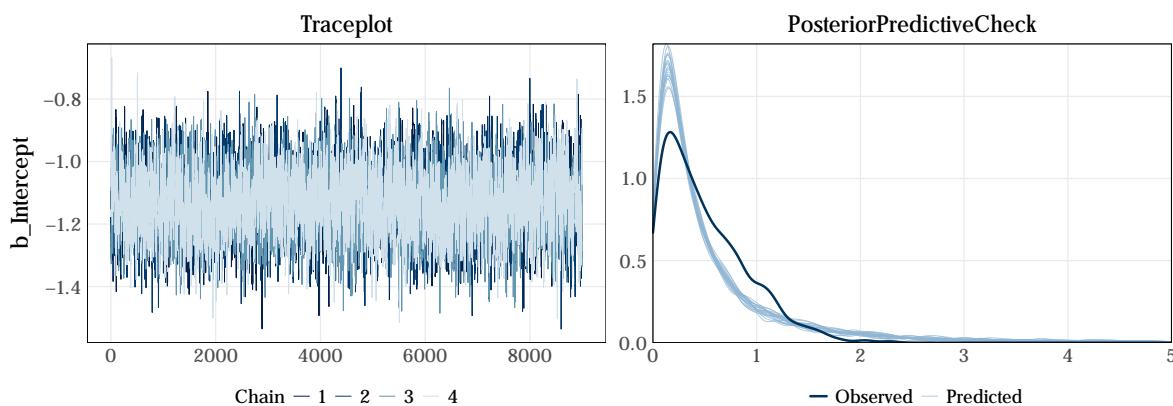
```
# Load model
temp <- brm(file="../Results/fit_H2a_CO2_M0.rds")
```

```
# Print Formula
temp$formula
```

```
OME_corr ~ 1 + (item_type | ID) + (1 | ID_item)
```

```
# Make model parameter table
model_parameters(temp, centrality = "mean", dispersion = TRUE,
                 ci_method = "hdi", effects = "all") %>%
  kable(digits=2) %>% kable_paper()
```

```
# Make trace and pp-check plot
brms_plot(temp)
```



Parameter	Effects	Component	Mean	SD	CI	CI_low	CI_high	pd
b_Intercept	fixed	conditional	-1.14	0.10	0.95	-1.34	-0.93	1.00
b_item_type	fixed	conditional	0.04	0.12	0.95	-0.19	0.27	0.65
sd_ID_Intercept	random	conditional	0.47	0.06	0.95	0.36	0.60	1.00
sd_ID_item_type	random	conditional	0.15	0.04	0.95	0.08	0.24	1.00
sd_ID_item_Intercept	random	conditional	0.43	0.05	0.95	0.35	0.53	1.00
cor_ID_Intercept_item_type	random	conditional	-0.14	0.33	0.95	-0.78	0.49	0.67
sigma	fixed	sigma	0.99	0.02	0.95	0.96	1.02	1.00

CO₂ M1

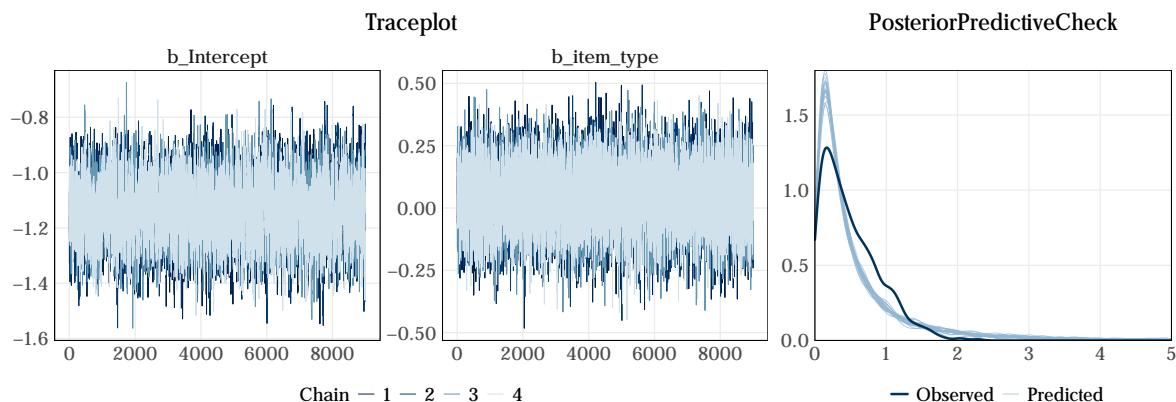
```
# Load model
temp <- brm(file = "../Results/fit_H2a_CO2_M1.rds")

# Print Formula
temp$formula
```

OME_corr ~ item_type + (item_type | ID) + (1 | ID_item)

```
# Make model parameter table
model_parameters(temp, centrality = "mean", dispersion = TRUE,
                 ci_method = "hdi", effects = "all") %>%
  kable(digits=2) %>% kable_paper()
```

```
# Make trace and pp-check plot
brms_plot(temp) + plot_layout(widths = c(2, 1))
```



Parameter	Effects	Component	Mean	SD	CI	CI_low	CI_high	pd	F
b_Intercept	fixed	conditional	-2.01	0.09	0.95	-2.19	-1.83	1	
sd_ID_Intercept	random	conditional	0.60	0.07	0.95	0.46	0.73	1	
sd_ID_item_type	random	conditional	0.78	0.10	0.95	0.58	0.97	1	
sd_ID_item_Intercept	random	conditional	0.35	0.04	0.95	0.27	0.44	1	
cor_ID_Intercept_item_type	random	conditional	-0.69	0.10	0.95	-0.86	-0.50	1	
sigma	fixed	sigma	1.21	0.02	0.95	1.18	1.25	1	

kcal M0

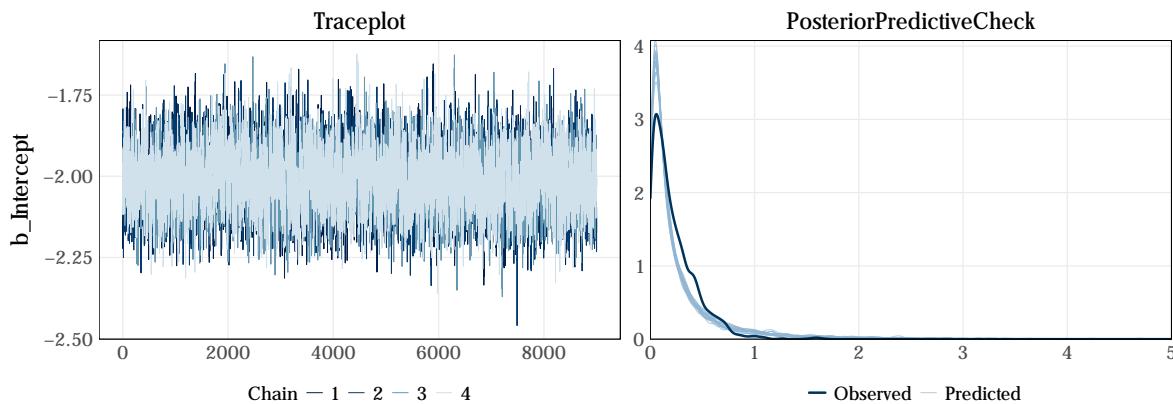
```
# Load model
temp <- brm(file="..../Results/fit_H2a_kcal_M0.rds")
```

```
# Print Formula
temp$formula
```

```
OME_corr ~ 1 + (item_type | ID) + (1 | ID_item)
```

```
# Make model parameter table
model_parameters(temp, centrality = "mean", dispersion = TRUE,
                 ci_method = "hdi", effects = "all") %>%
  kable(digits=2) %>% kable_paper()
```

```
# Make trace and pp-check plot
brms_plot(temp)
```



Parameter	Effects	Component	Mean	SD	CI	CI_low	CI_high	pd
b_Intercept	fixed	conditional	-2.09	0.10	0.95	-2.29	-1.88	1.00
b_item_type	fixed	conditional	0.20	0.14	0.95	-0.07	0.46	0.93
sd_ID_Intercept	random	conditional	0.59	0.07	0.95	0.46	0.73	1.00
sd_ID_item_type	random	conditional	0.77	0.10	0.95	0.58	0.97	1.00
sd_ID_item_Intercept	random	conditional	0.35	0.04	0.95	0.27	0.43	1.00
cor_ID_Intercept_item_type	random	conditional	-0.68	0.10	0.95	-0.86	-0.49	1.00
sigma	fixed	sigma	1.21	0.02	0.95	1.18	1.25	1.00

kcal M1

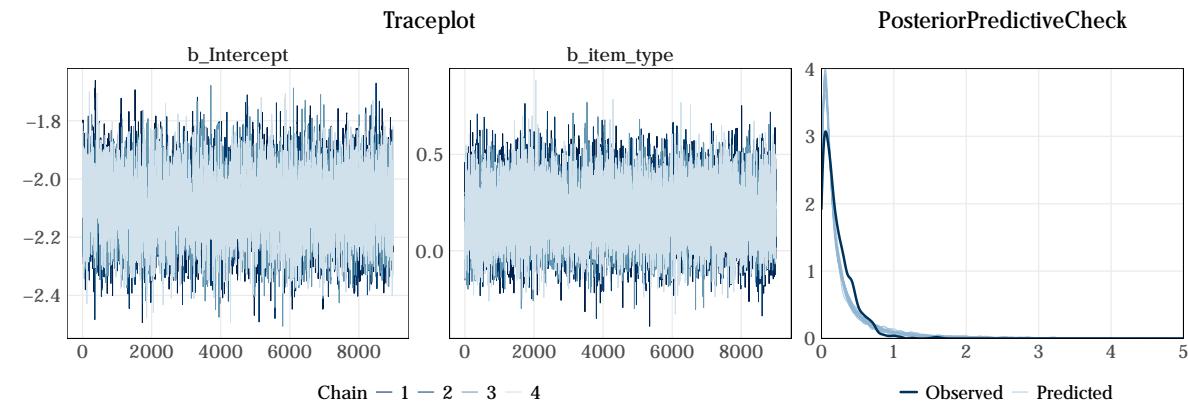
```
# Load model
temp <- brm(file = "../Results/fit_H2a_kcal_M1.rds")
```

```
# Print Formula
temp$formula
```

```
OME_corr ~ item_type + (item_type | ID) + (1 | ID_item)
```

```
# Make model parameter table
model_parameters(temp, centrality = "mean", dispersion = TRUE,
                 ci_method = "hdi", effects = "all") %>%
  kable(digits=2) %>% kable_paper()
```

```
# Make trace and pp-check plot
brms_plot(temp) + plot_layout(widths = c(2, 1))
```



Parameter	Effects	Component	Mean	SD	CI	CI_low	CI_high	pd
b_Intercept	fixed	conditional	0.71	0.05	0.95	0.62	0.81	1.00
sd_ID_Intercept	random	conditional	0.26	0.04	0.95	0.18	0.34	1.00
sd_ID_item_type	random	conditional	0.18	0.05	0.95	0.09	0.27	1.00
cor_ID_Intercept_item_type	random	conditional	-0.48	0.30	0.95	-1.00	0.03	0.94
sigma	fixed	sigma	0.17	0.03	0.95	0.10	0.24	1.00

Hypothesis 2b (ρ)

CO₂ M0

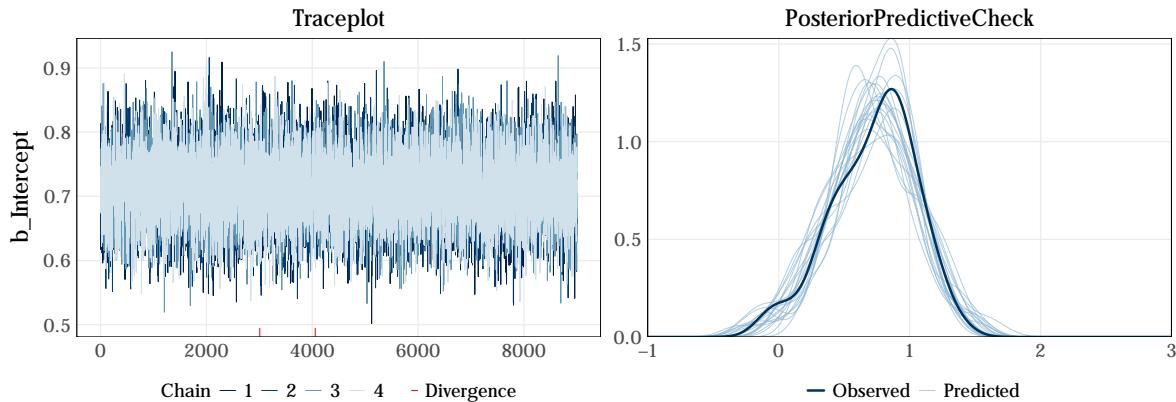
```
# Load model
temp <- brm(file="../Results/fit_H2b_CO2_M0.rds")

# Print Formula
temp$formula

rank_z ~ 1 + (item_type | ID)

# Make model parameter table
model_parameters(temp, centrality = "mean", dispersion = TRUE,
                 ci_method = "hdi", effects = "all") %>%
  kable(digits=2) %>% kable_paper()

# Make trace and pp-check plot
brms_plot(temp, lim=c(-1,3))
```



Parameter	Effects	Component	Mean	SD	CI	CI_low	CI_high	pd
b_Intercept	fixed	conditional	0.72	0.05	0.95	0.62	0.82	1.00
b_item_type	fixed	conditional	-0.03	0.06	0.95	-0.13	0.08	0.69
sd_ID_Intercept	random	conditional	0.26	0.04	0.95	0.18	0.34	1.00
sd_ID_item_type	random	conditional	0.18	0.05	0.95	0.09	0.28	1.00
cor_ID_Intercept item_type	random	conditional	-0.48	0.30	0.95	-1.00	0.04	0.94
sigma	fixed	sigma	0.17	0.03	0.95	0.10	0.24	1.00

CO₂ M1

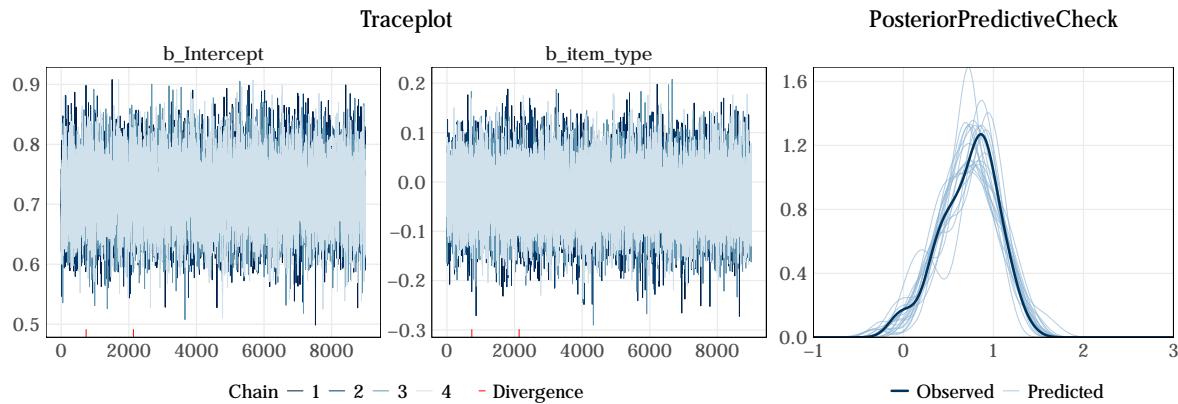
```
# Load model
temp <- brm(file="../Results/fit_H2b_CO2_M1.rds")

# Print Formular
temp$formula

rank_z ~ item_type + (item_type | ID)

# Make model parameter table
model_parameters(temp, centrality = "mean", dispersion = TRUE,
                 ci_method = "hdi", effects = "all") %>%
  kable(digits=2) %>% kable_paper()

# Make trace and pp-check plot
brms_plot(temp,lim=c(-1,3)) + plot_layout(widths = c(2, 1))
```



Parameter	Effects	Component	Mean	SD	CI	CI_low	CI_high	pd
b_Intercept	fixed	conditional	1.01	0.06	0.95	0.89	1.12	1.00
sd_ID_Intercept	random	conditional	0.30	0.05	0.95	0.21	0.40	1.00
sd_ID_item_type	random	conditional	0.20	0.07	0.95	0.08	0.32	1.00
cor_ID_Intercept_item_type	random	conditional	-0.34	0.34	0.95	-1.00	0.25	0.85
sigma	fixed	sigma	0.22	0.04	0.95	0.13	0.31	1.00

kcal M0

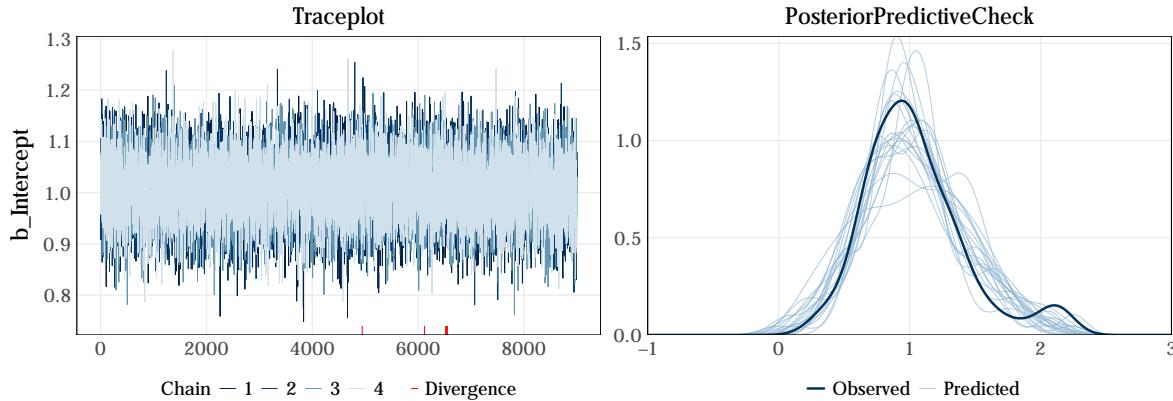
```
# Load model
temp <- brm(file='../Results/fit_H2b_kcal_M0.rds')

# Print Formula
temp$formula

rank_z ~ 1 + (item_type | ID)

# Make model parameter table
model_parameters(temp, centrality = "mean", dispersion = TRUE,
                 ci_method = "hdi", effects = "all") %>%
  kable(digits=2) %>% kable_paper()
```

```
# Make trace and pp-check plot
brms_plot(temp, lim=c(-1,3))
```



Parameter	Effects	Component	Mean	SD	CI	CI_low	CI_high	pd
b_Intercept	fixed	conditional	1.02	0.06	0.95	0.91	1.13	1.00
b_item_type	fixed	conditional	-0.13	0.06	0.95	-0.25	-0.01	0.99
sd_ID_Intercept	random	conditional	0.30	0.05	0.95	0.21	0.40	1.00
sd_ID_item_type	random	conditional	0.19	0.06	0.95	0.08	0.31	1.00
cor_ID_Intercept item_type	random	conditional	-0.32	0.34	0.95	-1.00	0.26	0.83
sigma	fixed	sigma	0.21	0.04	0.95	0.12	0.29	1.00

kcal M1

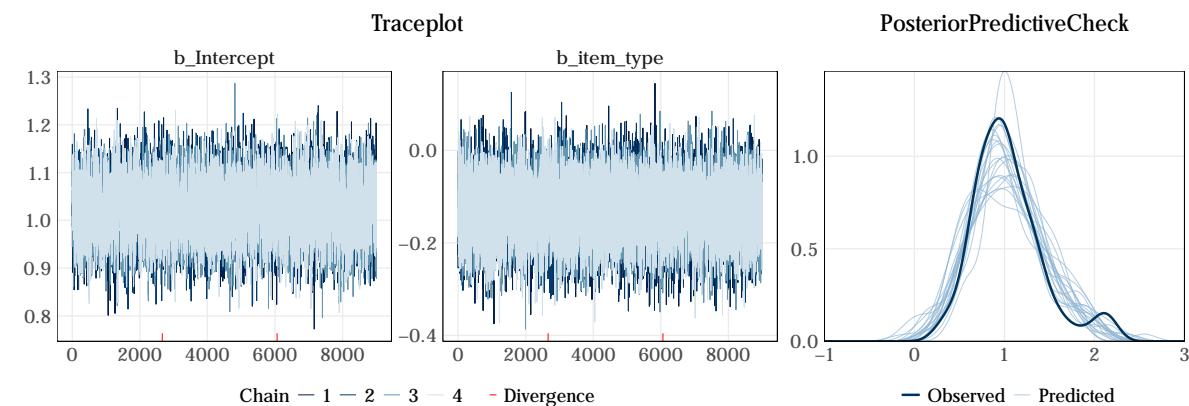
```
# Load model
temp <- brm(file="../Results/fit_H2b_kcal_M1.rds")

# Print Formula
temp$formula

rank_z ~ item_type + (item_type | ID)

# Make model parameter table
model_parameters(temp, centrality = "mean", dispersion = TRUE,
                 ci_method = "hdi", effects = "all") %>%
  kable(digits=2) %>% kable_paper()

# Make trace and pp-check plot
brms_plot(temp,lim=c(-1,3)) + plot_layout(widths = c(2, 1))
```



Parameter	Effects	Component	Mean	SD
b_Intercept	fixed	conditional	-1.23	0.08
b_match_domain	fixed	conditional	-0.49	0.13
sd_ID_Intercept	random	conditional	0.75	0.00
sd_ID_item_Intercept	random	conditional	0.33	0.00
sd_ID_item_est_criterionKcal	random	conditional	0.57	0.00
sd_ID_item_match_domain	random	conditional	0.16	0.00
sd_ID_item_est_criterionKcal:match_domain	random	conditional	0.17	0.00
cor_ID_item_Intercept_est_criterionKcal	random	conditional	-0.60	0.11
cor_ID_item_Intercept_match_domain	random	conditional	0.69	0.11
cor_ID_item_est_criterionKcal_match_domain	random	conditional	-0.42	0.24
cor_ID_item_Intercept_est_criterionKcal:match_domain	random	conditional	-0.45	0.20
cor_ID_item_est_criterionKcal_est_criterionKcal:match_domain	random	conditional	0.19	0.33
cor_ID_item_match_domain_est_criterionKcal:match_domain	random	conditional	-0.57	0.28
sigma	fixed	sigma	1.05	0.00

Hypothesis 3a (OME)

M0

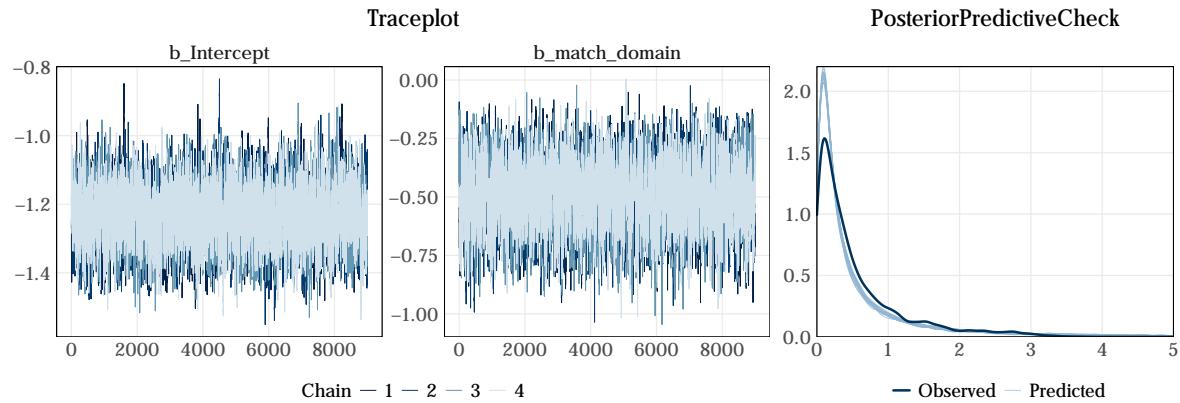
```
# Load model
temp <- brm(file="../Results/fit_H3a_M0.rds")

# Print Formular
temp$formula

OME_corr ~ match_domain + (1 | ID) + (est_criterion * match_domain | ID_item)

# Make model parameter table
model_parameters(temp, centrality = "mean", dispersion = TRUE,
                 ci_method = "hdi", effects = "all") %>%
  kable(digits=2) %>% kable_paper()

# Make trace and pp-check plot
brms_plot(temp) + plot_layout(widths = c(2, 1))
```



M1

```
# Load model
temp <- brm(file="..../Results/fit_H3a_M1.rds")

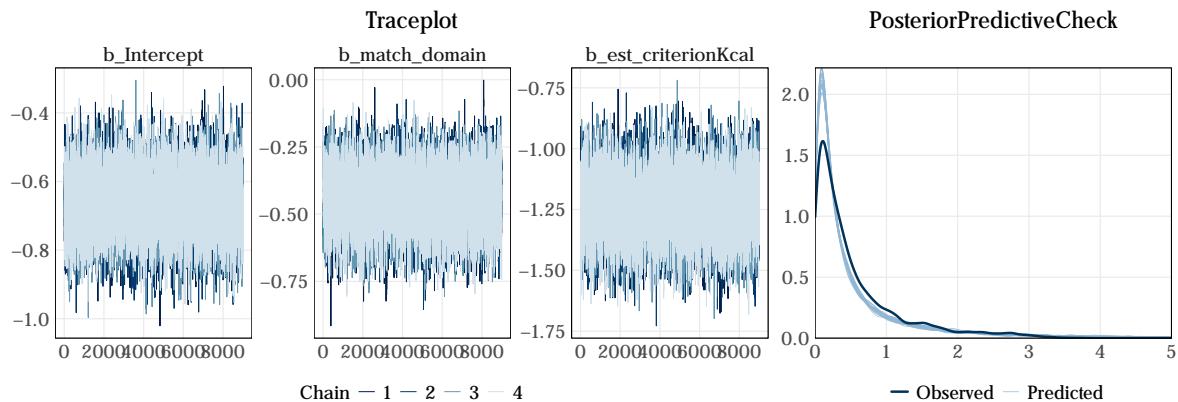
# Print Formula
temp$formula
```

```
OME_corr ~ match_domain + est_criterion + (1 | ID) + (est_criterion * match_domain | ID_item)

# Make model parameter table
model_parameters(temp, centrality = "mean", dispersion = TRUE,
                 ci_method = "hdi", effects = "all") %>%
  kable(digits=2) %>% kable_paper()
```

```
# Make trace and pp-check plot
brms_plot(temp) + plot_layout(widths = c(2, 1))
```

Parameter	Effects	Component	Mean	SD
b_Intercept	fixed	conditional	-0.66	0.08
b_match_domain	fixed	conditional	-0.44	0.10
b_est_criterionKcal	fixed	conditional	-1.23	0.11
sd_ID_Intercept	random	conditional	0.60	0.08
sd_ID_item_Intercept	random	conditional	0.30	0.08
sd_ID_item_est_criterionKcal	random	conditional	0.44	0.08
sd_ID_item_match_domain	random	conditional	0.16	0.08
sd_ID_item_est_criterionKcal:match_domain	random	conditional	0.17	0.08
cor_ID_item_Intercept_est_criterionKcal	random	conditional	-0.53	0.11
cor_ID_item_Intercept_match_domain	random	conditional	0.70	0.10
cor_ID_item_est_criterionKcal_match_domain	random	conditional	-0.44	0.20
cor_ID_item_Intercept_est_criterionKcal:match_domain	random	conditional	-0.50	0.20
cor_ID_item_est_criterionKcal_est_criterionKcal:match_domain	random	conditional	0.32	0.20
cor_ID_item_match_domain_est_criterionKcal:match_domain	random	conditional	-0.60	0.20
sigma	fixed	sigma	1.05	0.08



M2

```
# Load model
temp <- brm(file = "../Results/fit_H3a_M2.rds")

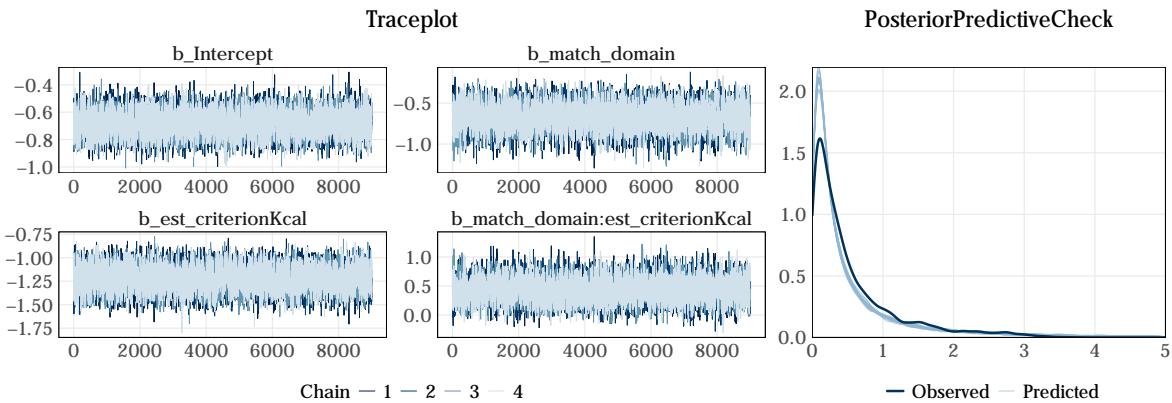
# Print Formula
temp$formula
```

```
OME_corr ~ match_domain * est_criterion + (1 | ID) + (est_criterion * match_domain | ID_item)
```

Parameter	Effects	Component	Mean	SD
b_Intercept	fixed	conditional	-0.68	0.08
b_match_domain	fixed	conditional	-0.67	0.13
b_est_criterionKcal	fixed	conditional	-1.22	0.11
b_match_domain:est_criterionKcal	fixed	conditional	0.44	0.19
sd_ID_Intercept	random	conditional	0.58	0.08
sd_ID_item_Intercept	random	conditional	0.30	0.08
sd_ID_item_est_criterionKcal	random	conditional	0.44	0.08
sd_ID_item_match_domain	random	conditional	0.16	0.08
sd_ID_item_est_criterionKcal:match_domain	random	conditional	0.17	0.08
cor_ID_item_Intercept_est_criterionKcal	random	conditional	-0.53	0.11
cor_ID_item_Intercept_match_domain	random	conditional	0.70	0.10
cor_ID_item_est_criterionKcal_match_domain	random	conditional	-0.44	0.24
cor_ID_item_Intercept_est_criterionKcal:match_domain	random	conditional	-0.50	0.24
cor_ID_item_est_criterionKcal_est_criterionKcal:match_domain	random	conditional	0.33	0.24
cor_ID_item_match_domain_est_criterionKcal:match_domain	random	conditional	-0.59	0.24
sigma	fixed	sigma	1.05	0.08

```
# Make model parameter table
model_parameters(temp, centrality = "mean", dispersion = TRUE,
                 ci_method = "hdi", effects = "all") %>%
  kable(digits=2) %>% kable_paper()
```

```
# Make trace and pp-check plot
brms_plot(temp) + plot_layout(widths = c(2, 1))
```



Parameter	Effects	Component	Mean	SD	CI	CI_low	CI_high	pd	Rhat	ES
b_Intercept	fixed	conditional	0.81	0.03	0.95	0.76	0.87	1.00	1.00	10661.5
b_match_domain	fixed	conditional	0.07	0.05	0.95	-0.03	0.18	0.92	1.00	12139.0
sd_ID_Intercept	random	conditional	0.22	0.06	0.95	0.11	0.32	1.00	1.00	565.5
sigma	fixed	sigma	0.23	0.06	0.95	0.10	0.32	1.00	1.01	342.1

Hypothesis 3b (ρ)

M0

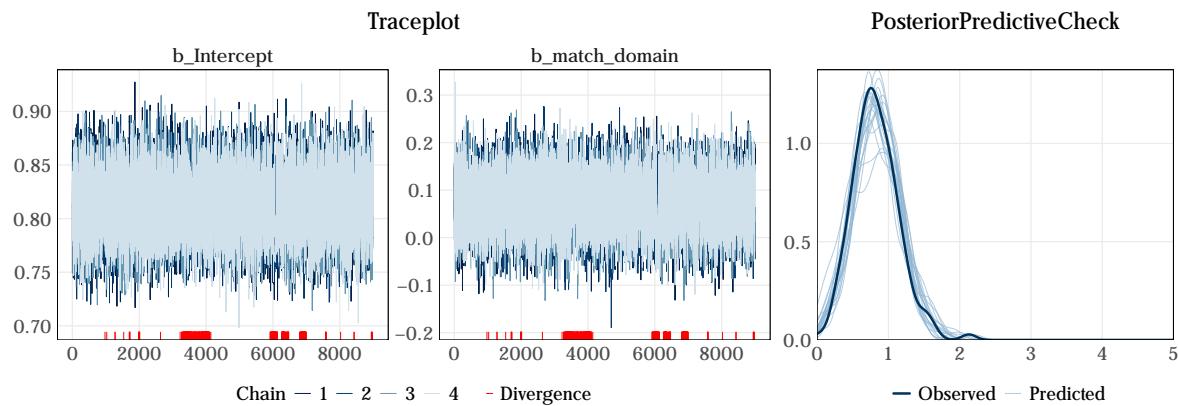
```
# Load model
temp <- brm(file="../Results/fit_H3b_M0.rds")

# Print Formular
temp$formula

rank_z ~ match_domain + (1 | ID)

# Make model parameter table
model_parameters(temp, centrality = "mean", dispersion = TRUE,
                  ci_method = "hdi", effects = "all") %>%
  kable(digits=2) %>% kable_paper()

# Make trace and pp-check plot
brms_plot(temp) + plot_layout(widths = c(2, 1))
```



Parameter	Effects	Component	Mean	SD	CI	CI_low	CI_high	pd	Rhat	H
b_Intercept	fixed	conditional	0.71	0.04	0.95	0.64	0.78	1.00	1.00	17064
b_match_domain	fixed	conditional	0.06	0.05	0.95	-0.04	0.16	0.87	1.00	14577
b_est_criterionKcal	fixed	conditional	0.20	0.05	0.95	0.10	0.31	1.00	1.00	15169
sd_ID_Intercept	random	conditional	0.21	0.05	0.95	0.11	0.30	1.00	1.00	1029
sigma	fixed	sigma	0.22	0.05	0.95	0.12	0.31	1.00	1.01	862

M1

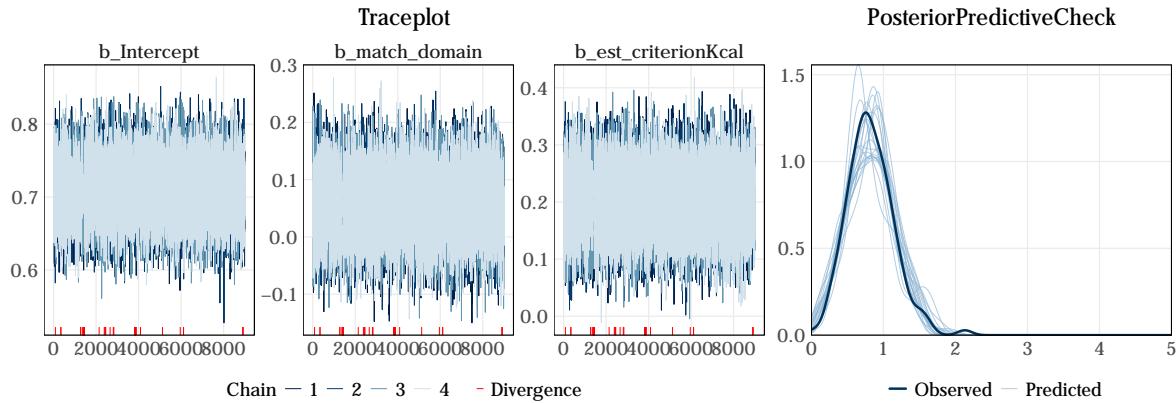
```
# Load model
temp <- brm(file='../Results/fit_H3b_M1.rds')

# Print Formular
temp$formula

rank_z ~ match_domain + est_criterion + (1 | ID)

# Make model parameter table
model_parameters(temp, centrality = "mean", dispersion = TRUE,
                 ci_method = "hdi", effects = "all") %>%
  kable(digits=2) %>% kable_paper()

# Make trace and pp-check plot
brms_plot(temp) + plot_layout(widths = c(2, 1))
```



Parameter	Effects	Component	Mean	SD	CI	CI_low	CI_high	po
b_Intercept	fixed	conditional	0.71	0.04	0.95	0.63	0.78	1.00
b_match_domain	fixed	conditional	0.01	0.07	0.95	-0.13	0.15	0.55
b_est_criterionKcal	fixed	conditional	0.21	0.05	0.95	0.10	0.31	1.00
b_match_domain:est_criterionKcal	fixed	conditional	0.10	0.10	0.95	-0.10	0.30	0.83
sd_ID_Intercept	random	conditional	0.21	0.06	0.95	0.11	0.31	1.00
sigma	fixed	sigma	0.22	0.06	0.95	0.10	0.31	1.00

M2

```
# Load model
temp <- brm(file="..../Results/fit_H3b_M2.rds")

# Print Formular
temp$formula

rank_z ~ match_domain * est_criterion + (1 | ID)

# Make model parameter table
model_parameters(temp, centrality = "mean", dispersion = TRUE,
                 ci_method = "hdi", effects = "all") %>%
  kable(digits=2) %>% kable_paper()

# Make trace and pp-check plot
brms_plot(temp) + plot_layout(widths = c(2, 1))
```

