Hypothesis tests — HPT (Czech data)

Multilevel models for H1–H2

HPT and Extremism project

2025-12-12

Contents

1 1. Purpose and hypotheses **1**

2 2. Data, variables, and preprocessing **2**

3 3. Model plan **5**

4 4. Results — decision rules **13**

5 5. Brief interpretation guide (for the write-up) **13**

6 6. Transparency and provenance **13**

7 7. Session info **13**

1 1. Purpose and hypotheses

This document runs the **main confirmatory analyses** for:

- **H1.** Higher right-authoritarian / pro-Nazi attitudes predict **higher HPT scores** on the original instrument (risk of ideological contamination). Predictors: FR-LF-mini (total or RD/NS facets) and KSA-3.
- **H2.** The H1 effect **persists controlling** for prior knowledge (KN total) and social desirability (SDR-5).

Notes on constructs and scoring:

- HPT subscores (POP, ROA, CONT) follow Hartmann & Hasselhorn / Huijgen et al. We treat **POP items as presentist** and therefore **reverse-score POP** so that **higher = more contextualised reasoning**. DVs used here are **HPT total (CTX6: POP_rev+CONT)**, **CONT**, and **POP_rev**.
- FR-LF-mini uses **RD1–RD3** and **NS1–NS3**; we analyse **total** and **RD/NS facets**.
- KSA-3 (9 items; aggression, submission, conventionalism) is included as a convergent authoritarian predictor. (Registered.)

2 2. Data, variables, and preprocessing

```
# Core
library(tidyverse)
library(readxl)
library(janitor)

# Models + tables
library(lme4)
library(lmerTest)
library(performance)
library(effectsize)
library(broom.mixed)
library(modelsummary)
library(glue)

library(kableExtra)
options(
  modelsummary_format = "latex",
  modelsummary_factory_latex = "kableExtra"
)
```

```
# Load the dataset created in 00_data-preparation
load("normalised_responses.RData")
stopifnot(exists("normalised_responses"))

# Clean names to lower_snake so items are pop1/roa1/cont1 etc.
dat_raw <- normalised_responses |> janitor::clean_names()

# ------------------------------------------------------------------
# Build a UNIQUE class identifier = school_id x class label
# We support multiple plausible column names from the codebook.
# ------------------------------------------------------------------
```

```r
# Detect school id column
school_var <- names(dat_raw)[names(dat_raw) %in% c("school_id","school")]
# Detect class label column (human-readable class label)
class_label_var <- names(dat_raw)[names(dat_raw) %in% c("classroom_label","class_label","class")]

if (length(school_var) == 0) stop("No school id column found (tried: school_id, school).")
if (length(class_label_var) == 0) stop("No class label column found (tried: classroom_label, class_label, class).")

school_var <- school_var[1]
class_label_var <- class_label_var[1]

# Force factors and create class_id
dat_raw <- dat_raw |>
  mutate(
    !!school_var := as.factor(.data[[school_var]]),
    !!class_label_var := as.factor(.data[[class_label_var]]),
    class_id = interaction(.data[[school_var]], .data[[class_label_var]], drop = TRUE)
  )

# ------------------
# HPT item vectors (lowercase after clean_names())
# ------------------
pop_items  <- paste0("pop", 1:3)
roa_items  <- paste0("roa", 1:3)
cont_items <- paste0("cont", 1:3)

# Reverse POP items so higher = more contextualised (1-4 scale assumed)
dat_raw <- dat_raw %>%
  mutate(across(all_of(pop_items), ~ 5 - as.numeric(.), .names = "{.col}_rev"))
```

```r
# ---- Knowledge ----
kn_items <- paste0("kn", 1:6)

dat <- dat_raw |>
  mutate(
    kn_total = rowSums(across(all_of(kn_items)), na.rm = TRUE)
  )

# ---- HPT (use reversed POP) ----
dat <- dat |>
  mutate(
    hpt_pop_rev = rowMeans(across(paste0(pop_items, "_rev")), na.rm = TRUE),
```

```
    hpt_cont    = rowMeans(across(all_of(cont_items)),       na.rm = TRUE),
    hpt_roa     = rowMeans(across(all_of(roa_items)),        na.rm = TRUE),
    # Primary total (CTX6 = POP_rev + CONT); keep 9-item as sensitivity if needed
    hpt_total   = rowMeans(cbind(hpt_pop_rev, hpt_cont), na.rm = TRUE),
    hpt_total9  = rowMeans(cbind(hpt_pop_rev, hpt_cont, hpt_roa), na.rm = TRUE)
  )

# ---- FR-LF mini ----
rd_items <- paste0("rd", 1:3)
ns_items <- paste0("ns", 1:3)

dat <- dat |>
  mutate(
    frlf_rd  = rowMeans(across(all_of(rd_items)), na.rm = TRUE),
    frlf_ns  = rowMeans(across(all_of(ns_items)), na.rm = TRUE),
    frlf_tot = rowMeans(cbind(frlf_rd, frlf_ns),  na.rm = TRUE)
  )

# ---- KSA-3 ----
a_items   <- paste0("a", 1:3)
u_items   <- paste0("u", 1:3)
k_items   <- paste0("k", 1:3)
ksa_items <- c(a_items, u_items, k_items)

dat <- dat |>
  mutate(
    ksa3_a   = rowMeans(across(all_of(a_items)),   na.rm = TRUE),
    ksa3_u   = rowMeans(across(all_of(u_items)),   na.rm = TRUE),
    ksa3_k   = rowMeans(across(all_of(k_items)),   na.rm = TRUE),
    ksa3_tot = rowMeans(across(all_of(ksa_items)), na.rm = TRUE)
  )

# ---- SDR-5 ----
sdr_items <- paste0("sdr", 1:5)

dat <- dat |>
  mutate(
    sdr5_tot = rowMeans(across(all_of(sdr_items)), na.rm = TRUE)
  )
```

```
# Z-standardise continuous predictors (for comparability)
z <- function(x) as.numeric(scale(x))
```

```r
# Ensure clustering vars present for every analysed row

dat <- dat |>
  mutate(
    z_hpt_total = z(hpt_total),
    z_hpt_cont  = z(hpt_cont),
    z_hpt_pop   = z(hpt_pop_rev),

    z_frlf_tot = z(frlf_tot),
    z_frlf_rd  = z(frlf_rd),
    z_frlf_ns  = z(frlf_ns),

    z_ksa3_tot = z(ksa3_tot),

    z_kn_total = z(kn_total),
    z_sdr5_tot = z(sdr5_tot)
  ) |>
  drop_na(all_of(c(school_var, "class_id")))
```

3 3. Model plan

We estimate **random-intercept multilevel models** with **two clustering terms** (students nested in classes within schools):

- Base (FR-LF total): `DV ~ z_frlf_tot + z_ksa3_tot + z_kn_total + z_sdr5_tot + (1 | school_id) + (1 | class_id)`
- Facet (RD/NS): `DV ~ z_frlf_rd + z_frlf_ns + z_ksa3_tot + z_kn_total + z_sdr5_tot + (1 | school_id) + (1 | class_id)`
- Interaction (if preregistered): `DV ~ z_frlf_tot * z_kn_total + z_ksa3_tot + z_sdr5_tot + (1 | school_id) + (1 | class_id)`

DVs: `z_hpt_total` (CTX6), `z_hpt_cont`, `z_hpt_pop` (POP_rev).

```r
dv_list <- c("z_hpt_total","z_hpt_cont","z_hpt_pop")

fits <- list()

for (dv in dv_list) {
  form_base  <- as.formula(
    glue("{dv} ~ z_frlf_tot + z_ksa3_tot + z_kn_total + z_sdr5_tot + (1 | {school_var}) + (1 | class_id)")
  )
  form_facet <- as.formula(
    glue("{dv} ~ z_frlf_rd + z_frlf_ns + z_ksa3_tot + z_kn_total + z_sdr5_tot + (1 | {school_var}) + (1 | class_id)")
```

```
  )
  form_int   <- as.formula(
    glue("{dv} ~ z_frlf_tot * z_kn_total + z_ksa3_tot + z_sdr5_tot + (1 | {school_var}) + (1 | class_id)")
  )

  m_base  <- lmer(form_base,  data = dat)
  m_facet <- lmer(form_facet, data = dat)
  m_int   <- lmer(form_int,   data = dat)

  fits[[dv]] <- list(base=m_base, facet=m_facet, int=m_int)
}
```

```
msummary(
  list(
    "HPT total (CTX6) - Base"  = fits$z_hpt_total$base,
    "HPT total (CTX6) - Facet" = fits$z_hpt_total$facet,
    "HPT total (CTX6) - Int."  = fits$z_hpt_total$int
  ),
  statistic = "({std.error})",
  gof_omit = "IC|Log|AIC|BIC",
  stars = TRUE
)
```

```
msummary(
  list(
    "CONT - Base"  = fits$z_hpt_cont$base,
    "CONT - Facet" = fits$z_hpt_cont$facet,
    "CONT - Int."  = fits$z_hpt_cont$int
  ),
  statistic = "({std.error})",
  gof_omit = "IC|Log|AIC|BIC",
  stars = TRUE
)
```

```
msummary(
  list(
    "POP_rev - Base"  = fits$z_hpt_pop$base,
    "POP_rev - Facet" = fits$z_hpt_pop$facet,
    "POP_rev - Int."  = fits$z_hpt_pop$int
  ),
```

	HPT total (CTX6) — Base	HPT total (CTX6) — Facet	HPT total (CTX6) — Int.
(Intercept)	−0.027	−0.031	−0.029
	(0.090)	(0.088)	(0.090)
z_frlf_tot	0.036		0.037
	(0.075)		(0.075)
z_ksa3_tot	−0.081	−0.079	−0.080
	(0.075)	(0.075)	(0.075)
z_kn_total	0.320***	0.322***	0.318***
	(0.064)	(0.064)	(0.065)
z_sdr5_tot	−0.048	−0.034	−0.047
	(0.065)	(0.067)	(0.065)
z_frlf_rd		−0.019	
		(0.075)	
z_frlf_ns		0.066	
		(0.074)	
z_frlf_tot × z_kn_total			−0.019
			(0.068)
SD (Intercept class_id)	0.000	0.000	0.000
SD (Intercept school_id)	0.158	0.150	0.155
SD (Observations)	0.943	0.943	0.945
Num.Obs.	228	227	228
R2 Marg.	0.105	0.106	0.105
RMSE	0.93	0.93	0.93

+ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

	CONT — Base	CONT — Facet	CONT — Int.
(Intercept)	−0.048	−0.052	−0.062
	(0.099)	(0.098)	(0.098)
z_frlf_tot	0.044		0.046
	(0.078)		(0.077)
z_ksa3_tot	0.025	0.032	0.031
	(0.078)	(0.078)	(0.077)
z_kn_total	0.199**	0.202**	0.184**
	(0.066)	(0.066)	(0.066)
z_sdr5_tot	−0.015	0.005	−0.007
	(0.067)	(0.069)	(0.067)
z_frlf_rd		−0.045	
		(0.078)	
z_frlf_ns		0.099	
		(0.077)	
z_frlf_tot × z_kn_total			−0.119+
			(0.070)
SD (Intercept class_id)	0.092	0.101	0.107
SD (Intercept school_id)	0.176	0.168	0.165
SD (Observations)	0.972	0.970	0.967
Num.Obs.	228	227	228
R2 Marg.	0.041	0.046	0.053
R2 Cond.	0.079	0.084	0.090
RMSE	0.95	0.95	0.95

+ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

	POP_rev — Base	POP_rev — Facet	POP_rev — Int.
(Intercept)	0.004	0.000	0.016
	(0.062)	(0.062)	(0.062)
z_frlf_tot	0.003		0.000
	(0.073)		(0.073)
z_ksa3_tot	−0.176*	−0.179*	−0.181*
	(0.073)	(0.074)	(0.073)
z_kn_total	0.340***	0.338***	0.352***
	(0.063)	(0.063)	(0.063)
z_sdr5_tot	−0.068	−0.066	−0.074
	(0.064)	(0.066)	(0.064)
z_frlf_rd		0.012	
		(0.075)	
z_frlf_ns		−0.004	
		(0.074)	
z_frlf_tot × z_kn_total			0.093
			(0.067)
SD (Intercept class_id)	0.000	0.000	0.000
SD (Intercept school_id)	0.000	0.000	0.000
SD (Observations)	0.935	0.937	0.933
Num.Obs.	228	227	228
R2 Marg.	0.140	0.138	0.146
RMSE	0.92	0.92	0.92

+ p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001

```
  statistic = "({std.error})",
  gof_omit = "IC|Log|AIC|BIC",
  stars = TRUE
)
```

```
`%||%` <- function(a, b) if (!is.null(a) && length(a) > 0) a else b

collect_metrics <- function(m) {
  icc_val <- tryCatch({
    ic <- performance::icc(m)
    as.numeric(ic$ICC_adjusted %||% ic$ICC %||% ic$ICC_conditional %||% NA_real_)
  }, error = function(e) NA_real_)

  r2m <- r2c <- NA_real_
```

```r
  try({
    r2o <- performance::r2_nakagawa(m)
    r2m <- as.numeric(r2o$R2_marginal %||% r2o$R2m %||% NA_real_)
    r2c <- as.numeric(r2o$R2_conditional %||% r2o$R2c %||% NA_real_)
  }, silent = TRUE)

  data.frame(ICC = icc_val, R2_m = r2m, R2_c = r2c, check.names = FALSE)
}

metrics <- dplyr::bind_rows(
  list(
    `HPT total (CTX6) - Base`  = collect_metrics(fits$z_hpt_total$base),
    `HPT total (CTX6) - Facet` = collect_metrics(fits$z_hpt_total$facet),
    `HPT total (CTX6) - Int.`  = collect_metrics(fits$z_hpt_total$int),
    `CONT - Base`              = collect_metrics(fits$z_hpt_cont$base),
    `CONT - Facet`             = collect_metrics(fits$z_hpt_cont$facet),
    `CONT - Int.`              = collect_metrics(fits$z_hpt_cont$int),
    `POP_rev - Base`           = collect_metrics(fits$z_hpt_pop$base),
    `POP_rev - Facet`          = collect_metrics(fits$z_hpt_pop$facet),
    `POP_rev - Int.`           = collect_metrics(fits$z_hpt_pop$int)
  ),
  .id = "Model"
)
```

```
## Random effect variances not available. Returned R2 does not account for random effects.

## Random effect variances not available. Returned R2 does not account for random effects.

## Random effect variances not available. Returned R2 does not account for random effects.

## Random effect variances not available. Returned R2 does not account for random effects.

## Random effect variances not available. Returned R2 does not account for random effects.

## Random effect variances not available. Returned R2 does not account for random effects.
```

```r
knitr::kable(metrics, digits = 3, caption = "Model fit and clustering (ICC, $R^2$).")
```

Table 1: Model fit and clustering (ICC, R^2).

Model	ICC	R2_m	R2_c
HPT total (CTX6) — Base	NA	0.105	NA
HPT total (CTX6) — Facet	NA	0.106	NA
HPT total (CTX6) — Int.	NA	0.105	NA
CONT — Base	0.040	0.041	0.079
CONT — Facet	0.039	0.046	0.084
CONT — Int.	0.040	0.053	0.090
POP_rev — Base	NA	0.140	NA
POP_rev — Facet	NA	0.138	NA
POP_rev — Int.	NA	0.146	NA

```
tidy_all <- function(lst, label) {
  bind_rows(
    broom.mixed::tidy(lst$base,  effects="fixed", conf.int=TRUE) |> mutate(spec="Base"),
    broom.mixed::tidy(lst$facet, effects="fixed", conf.int=TRUE) |> mutate(spec="Facet"),
    broom.mixed::tidy(lst$int,   effects="fixed", conf.int=TRUE) |> mutate(spec="Interaction")
  ) |>
    filter(term != "(Intercept)") |>
    mutate(dv = label)
}

tidy_tbl <- bind_rows(
  tidy_all(fits$z_hpt_total, "HPT total (CTX6)"),
  tidy_all(fits$z_hpt_cont,  "CONT"),
  tidy_all(fits$z_hpt_pop,   "POP_rev")
)

knitr::kable(
  tidy_tbl |> select(dv, spec, term, estimate, conf.low, conf.high, p.value),
  digits = 3,
  caption = "Fixed effects (standardized coefficients)."
)
```

Table 2: Fixed effects (standardized coefficients).

dv	spec	term	estimate	conf.low	conf.high	p.value
HPT total (CTX6)	Base	z_frlf_tot	0.036	-0.111	0.184	0.628
HPT total (CTX6)	Base	z_ksa3_tot	-0.081	-0.229	0.066	0.279

dv	spec	term	estimate	conf.low	conf.high	p.value
HPT total (CTX6)	Base	z_kn_total	0.320	0.194	0.446	0.000
HPT total (CTX6)	Base	z_sdr5_tot	-0.048	-0.176	0.080	0.463
HPT total (CTX6)	Facet	z_frlf_rd	-0.019	-0.168	0.129	0.799
HPT total (CTX6)	Facet	z_frlf_ns	0.066	-0.081	0.213	0.378
HPT total (CTX6)	Facet	z_ksa3_tot	-0.079	-0.228	0.070	0.297
HPT total (CTX6)	Facet	z_kn_total	0.322	0.196	0.448	0.000
HPT total (CTX6)	Facet	z_sdr5_tot	-0.034	-0.165	0.098	0.613
HPT total (CTX6)	Interaction	z_frlf_tot	0.037	-0.111	0.185	0.626
HPT total (CTX6)	Interaction	z_kn_total	0.318	0.190	0.445	0.000
HPT total (CTX6)	Interaction	z_ksa3_tot	-0.080	-0.228	0.068	0.286
HPT total (CTX6)	Interaction	z_sdr5_tot	-0.047	-0.175	0.082	0.476
HPT total (CTX6)	Interaction	z_frlf_tot:z_kn_total	-0.019	-0.153	0.115	0.779
CONT	Base	z_frlf_tot	0.044	-0.109	0.197	0.571
CONT	Base	z_ksa3_tot	0.025	-0.128	0.178	0.744
CONT	Base	z_kn_total	0.199	0.068	0.329	0.003
CONT	Base	z_sdr5_tot	-0.015	-0.148	0.117	0.818
CONT	Facet	z_frlf_rd	-0.045	-0.199	0.108	0.561
CONT	Facet	z_frlf_ns	0.099	-0.052	0.250	0.198
CONT	Facet	z_ksa3_tot	0.032	-0.122	0.186	0.681
CONT	Facet	z_kn_total	0.202	0.072	0.333	0.002
CONT	Facet	z_sdr5_tot	0.005	-0.130	0.141	0.937
CONT	Interaction	z_frlf_tot	0.046	-0.106	0.198	0.554
CONT	Interaction	z_kn_total	0.184	0.053	0.314	0.006
CONT	Interaction	z_ksa3_tot	0.031	-0.121	0.184	0.687
CONT	Interaction	z_sdr5_tot	-0.007	-0.139	0.125	0.914
CONT	Interaction	z_frlf_tot:z_kn_total	-0.119	-0.256	0.019	0.091
POP_rev	Base	z_frlf_tot	0.003	-0.142	0.148	0.969
POP_rev	Base	z_ksa3_tot	-0.176	-0.320	-0.032	0.017
POP_rev	Base	z_kn_total	0.340	0.216	0.463	0.000
POP_rev	Base	z_sdr5_tot	-0.068	-0.193	0.058	0.289
POP_rev	Facet	z_frlf_rd	0.012	-0.135	0.159	0.869
POP_rev	Facet	z_frlf_ns	-0.004	-0.149	0.141	0.955
POP_rev	Facet	z_ksa3_tot	-0.179	-0.324	-0.034	0.016
POP_rev	Facet	z_kn_total	0.338	0.214	0.462	0.000
POP_rev	Facet	z_sdr5_tot	-0.066	-0.195	0.063	0.314
POP_rev	Interaction	z_frlf_tot	0.000	-0.145	0.144	0.998
POP_rev	Interaction	z_kn_total	0.352	0.228	0.477	0.000
POP_rev	Interaction	z_ksa3_tot	-0.181	-0.325	-0.038	0.014
POP_rev	Interaction	z_sdr5_tot	-0.074	-0.200	0.051	0.245
POP_rev	Interaction	z_frlf_tot:z_kn_total	0.093	-0.039	0.225	0.166

4 4. Results — decision rules

Interpret **only the preregistered tests**:

- **H1 supported** if the coefficient for **FR-LF** (either `z_frlf_tot` in Base/Int. or `z_frlf_rd`/`z_frlf_ns` in Facet) is **> 0 and $p < .05$** for **HPT total (CTX6)** and/or **CONT**.
- **H2 supported** if the same holds **after** adding controls (**KN**, **SDR-5**) and **KSA-3** (already included), and — if preregistered — the **FR-LF × KN** interaction is **not necessary** for the main effect to persist (or, if hypothesised, is significant in the expected direction).

Reading POP_rev. Because POP is reversed, higher **POP_rev** means **less presentism / more contextualised fit** on items that originally cued presentist endorsements. Interpret alongside **CONT**.

5 5. Brief interpretation guide (for the write-up)

- **Effect size:** Coefficients are **standardised** ( ). Values around 0.10 are small, 0.20–0.30 moderate for individual-level predictors in multilevel models; report 95% CIs.
- **Clustering:** Report **ICC** to show class-level variance.
- **Model fit:** Report marginal and conditional R^2 and compare Base vs. Facet vs. Interaction.
- **Substantive meaning:** A **positive FR-LF** effect on **HPT total / CONT** suggests that ideological affinity **elevates apparent contextualisation**, consistent with the contamination concern.
- **Controls:** If FR-LF remains significant after **KN** and **SDR-5**, state that results are **not explained** by prior knowledge or social desirability (per H2).

6 6. Transparency and provenance

- HPT structure and reversal logic follow Hartmann & Hasselhorn / Huijgen et al.
- FR-LF-mini originates from the Leipzig FR-LF.
- Analysis plan: random-intercept LMMs; DVs: HPT total (CTX6), CONT, POP_rev; predictors: FR-LF (total; RD/NS facets), KSA-3; controls: KN, SDR-5; clustering: school + class_id.

7 7. Session info

```
sessionInfo()
```

```
## R version 4.4.2 (2024-10-31)
## Platform: x86_64-pc-linux-gnu
```

```
## Running under: Ubuntu 24.04.3 LTS
##
## Matrix products: default
## BLAS:   /usr/lib/x86_64-linux-gnu/blas/libblas.so.3.12.0
## LAPACK: /usr/lib/x86_64-linux-gnu/lapack/liblapack.so.3.12.0
##
## locale:
##  [1] LC_CTYPE=en_US.UTF-8       LC_NUMERIC=C
##  [3] LC_TIME=cs_CZ.UTF-8        LC_COLLATE=en_US.UTF-8
##  [5] LC_MONETARY=cs_CZ.UTF-8    LC_MESSAGES=en_US.UTF-8
##  [7] LC_PAPER=cs_CZ.UTF-8       LC_NAME=C
##  [9] LC_ADDRESS=C               LC_TELEPHONE=C
## [11] LC_MEASUREMENT=cs_CZ.UTF-8 LC_IDENTIFICATION=C
##
## time zone: Europe/Prague
## tzcode source: system (glibc)
##
## attached base packages:
## [1] stats     graphics  grDevices utils     datasets  methods   base
##
## other attached packages:
##  [1] kableExtra_1.4.0    glue_1.8.0          modelsummary_2.5.0
##  [4] broom.mixed_0.2.9.6 effectsize_1.0.1    performance_0.15.1
##  [7] lmerTest_3.1-3      lme4_1.1-38         Matrix_1.7-1
## [10] janitor_2.2.1       readxl_1.4.3        lubridate_1.9.4
## [13] forcats_1.0.0       stringr_1.5.1       dplyr_1.1.4
## [16] purrr_1.1.0         readr_2.1.5         tidyr_1.3.1
## [19] tibble_3.2.1        ggplot2_4.0.1       tidyverse_2.0.0
##
## loaded via a namespace (and not attached):
##  [1] tidyselect_1.2.1    viridisLite_0.4.2   farver_2.1.2
##  [4] S7_0.2.1            fastmap_1.2.0       TH.data_1.1-4
##  [7] bayestestR_0.17.0   digest_0.6.37       estimability_1.5.1
## [10] timechange_0.3.0    lifecycle_1.0.4     survival_3.7-0
## [13] magrittr_2.0.3      compiler_4.4.2      rlang_1.1.6
## [16] tools_4.4.2         yaml_2.3.10         data.table_1.17.8
## [19] knitr_1.50          xml2_1.3.6          RColorBrewer_1.1-3
## [22] multcomp_1.4-28     tinytable_0.15.1    withr_3.0.2
## [25] numDeriv_2016.8-1.1 grid_4.4.2          datawizard_1.2.0
## [28] xtable_1.8-4        future_1.68.0       globals_0.18.0
## [31] emmeans_1.10.6      scales_1.4.0        MASS_7.3-61
## [34] insight_1.4.2       cli_3.6.5           mvtnorm_1.3-2
```

```
## [37] rmarkdown_2.29      reformulas_0.4.1    generics_0.1.3
## [40] future.apply_1.20.0 rstudioapi_0.17.1   tzdb_0.5.0
## [43] parameters_0.28.1   minqa_1.2.8         splines_4.4.2
## [46] parallel_4.4.2      cellranger_1.1.0    vctrs_0.6.5
## [49] boot_1.3-31         sandwich_3.1-1      hms_1.1.3
## [52] listenv_0.10.0      systemfonts_1.3.1   parallelly_1.45.1
## [55] nloptr_2.2.1        codetools_0.2-20    stringi_1.8.4
## [58] gtable_0.3.6        tables_0.9.31       pillar_1.10.0
## [61] furrr_0.3.1         htmltools_0.5.8.1   R6_2.6.1
## [64] textshaping_0.4.1   Rdpack_2.6.4        evaluate_1.0.5
## [67] lattice_0.22-5      rbibutils_2.3       backports_1.5.0
## [70] broom_1.0.7         snakecase_0.11.1    Rcpp_1.0.13-1
## [73] checkmate_2.3.3     svglite_2.2.2       coda_0.19-4.1
## [76] nlme_3.1-166        xfun_0.54           zoo_1.8-14
## [79] pkgconfig_2.0.3
```