

Hypothesis tests — HPT (Czech data)

Multilevel models for H1–H2

HPT and Extremism project

2025-12-10

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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 instrument and subscores (POP, ROA, CONT) follow Hartmann & Hasselhorn / Huijgen et al. For this file we use **HPT total**, **CONT**, **POP** as DVs. (In our dataset, higher is coded as “fits Hannes’s situation better” across items; thus **higher CONT** means more contextualized alignment; **higher POP** reflects stronger endorsement of the presentism-trigger statements after our recoding.)
- FR-LF-mini uses **RD1–RD3** (right-dictatorship) and **NS1–NS3** (Nazi relativization) with robust reliability and a validated 6-dimension parent scale. We analyze **total** and the **RD/NS facets**.
- KSA-3 (9 items; aggression, submission, conventionalism) is included as a convergent authoritarian predictor. (Registered.)

2 2. Data, variables, and preprocessing

We expect either `normalised_responses_<DATE>.RData` or `.xlsx` in the project root. Variable names match the codebook.

```
# 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"))

dat_raw <- normalised_responses

dat_raw <- janitor::clean_names(dat_raw)
```

```

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

dat <- dat_raw |>
  mutate(
    # across() returns a data frame of the selected columns; rowSums works on that
    kn_total = rowSums(across(all_of(kn_items)), na.rm = TRUE)
  )

# ---- HPT ----
pop_items   <- paste0("pop", 1:3)
cont_items  <- paste0("cont", 1:3)
roa_items   <- paste0("roa", 1:3)

dat <- dat |>
  mutate(
    hpt_pop   = rowMeans(across(all_of(pop_items)), 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),
    hpt_total = rowMeans(cbind(hpt_pop, 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)
ksa3_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 ----
# (SDR2-SDR4 already reversed upstream)
sdr_items <- paste0("sdr", 1:5)

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

# ---- Clustering factor ----
cluster_var <- dplyr::case_when(
  "class_label" %in% names(dat) ~ "class_label",
  "class"       %in% names(dat) ~ "class",
  TRUE ~ NA_character_
)
if (is.na(cluster_var)) stop("No class cluster variable found (expected `class_label` or `class`).")
dat[[cluster_var]] <- as.factor(dat[[cluster_var]])

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

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

    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(!!sym(cluster_var)) # must have cluster id

```

3 3. Model plan

We estimate **random-intercept multilevel models** (students nested in classes). For each DV:

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

DVs: z_hpt_total, z_hpt_cont, z_hpt_pop.

Interpretation (fixed effects): positive β means **higher predictor \rightarrow higher DV** (in SD units). For **H1–H2**, the key test is **FR-LF coefficients** (or RD/NS) remaining positive and significant **after controls**.

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

fits <- list()

for (dv in dv_list) {

  # Build formulas INSIDE the loop (so {dv} exists when glue runs)
  form_base <- as.formula(
    glue("{dv} ~ z_frlf_tot + z_ksa3_tot + z_kn_total + z_sdr5_tot + (1 | {cluster_var})")
  )

  form_facet <- as.formula(
    glue("{dv} ~ z_frlf_rd + z_frlf_ns + z_ksa3_tot + z_kn_total + z_sdr5_tot + (1 | {cluster_var})")
  )

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

  # Fit models
  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
  )
}
```

	HPT total — Base	HPT total — Facet	HPT total — Int.
(Intercept)	0.001 (0.080)	-0.004 (0.083)	-0.014 (0.082)
z_frlf_tot	-0.078 (0.092)		-0.082 (0.092)
z_ksa3_tot	0.204* (0.091)	0.216* (0.092)	0.205* (0.091)
z_kn_total	0.124 (0.080)	0.129 (0.080)	0.110 (0.081)
z_sdr5_tot	0.103 (0.080)	0.123 (0.081)	0.109 (0.080)
z_frlf_rd		-0.136 (0.093)	
z_frlf_ns		0.042 (0.090)	
z_frlf_tot × z_kn_total			-0.075 (0.087)
SD (Intercept class_label)	0.058	0.082	0.058
SD (Observations)	0.984	0.984	0.985
Num.Obs.	159	158	159
R2 Marg.	0.057	0.065	0.061
R2 Cond.	0.060	0.071	0.064
RMSE	0.97	0.96	0.96

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

```
# Show standard errors in parentheses; alternatives include {t}, {p.value}, etc.
msummary(
  list(
    "HPT total - Base" = fits$z_hpt_total$base,
    "HPT total - Facet" = fits$z_hpt_total$facet,
    "HPT total - Int." = fits$z_hpt_total$int
  ),
  statistic = "{std.error}",
  gofomit = "IC|Log|AIC|BIC",
  stars = TRUE
)
```

```
msummary(
  list(
```

	CONT — Base	CONT — Facet	CONT — Int.
(Intercept)	-0.019 (0.096)	-0.025 (0.096)	-0.034 (0.099)
z_frlf_tot	-0.039 (0.091)		-0.043 (0.091)
z_ksa3_tot	0.075 (0.091)	0.088 (0.091)	0.076 (0.091)
z_kn_total	0.231** (0.079)	0.236** (0.078)	0.218** (0.080)
z_sdr5_tot	0.060 (0.079)	0.086 (0.080)	0.065 (0.079)
z_frlf_rd		-0.130 (0.091)	
z_frlf_ns		0.086 (0.088)	
z_frlf_tot × z_kn_total			-0.068 (0.086)
SD (Intercept class_label)	0.187	0.188	0.193
SD (Observations)	0.963	0.958	0.963
Num.Obs.	159	158	159
R2 Marg.	0.064	0.076	0.067
R2 Cond.	0.098	0.110	0.103
RMSE	0.94	0.93	0.93

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

```
"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 - Base" = fits$z_hpt_pop$base,
"POP - Facet" = fits$z_hpt_pop$facet,
"POP - Int." = fits$z_hpt_pop$int
```

	POP — Base	POP — Facet	POP — Int.
(Intercept)	-0.005 (0.075)	0.000 (0.075)	-0.014 (0.077)
z_frlf_tot	-0.039 (0.088)		-0.042 (0.088)
z_ksa3_tot	0.173* (0.087)	0.176* (0.088)	0.174* (0.087)
z_kn_total	-0.329*** (0.076)	-0.328*** (0.077)	-0.337*** (0.078)
z_sdr5_tot	0.096 (0.076)	0.092 (0.078)	0.100 (0.077)
z_frlf_rd		-0.031 (0.089)	
z_frlf_ns		-0.022 (0.087)	
z_frlf_tot × z_kn_total			-0.044 (0.084)
SD (Intercept class_label)	0.000	0.000	0.000
SD (Observations)	0.942	0.946	0.944
Num.Obs.	159	158	159
R2 Marg.	0.132	0.131	0.133
RMSE	0.93	0.93	0.93

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

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

# Robust extractors so we ALWAYS return a single-row data.frame
`%||%` <- function(a, b) if (!is.null(a) && length(a) > 0) a else b

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

```

    )
}, error = function(e) NA_real_)

# R2 (prefer Nakagawa; fallbacks to older names)
r2m <- r2c <- NA_real_
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 - Base` = collect_metrics(fits$z_hpt_total$base),
    `HPT total - Facet` = collect_metrics(fits$z_hpt_total$facet),
    `HPT total - 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 - Base` = collect_metrics(fits$z_hpt_pop$base),
    `POP - Facet` = collect_metrics(fits$z_hpt_pop$facet),
    `POP - 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.

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 — Base	0.004	0.057	0.060
HPT total — Facet	0.007	0.065	0.071
HPT total — Int.	0.004	0.061	0.064
CONT — Base	0.036	0.064	0.098
CONT — Facet	0.037	0.076	0.110
CONT — Int.	0.039	0.067	0.103
POP — Base	NA	0.132	NA
POP — Facet	NA	0.131	NA
POP — Int.	NA	0.133	NA

```
# Extract tidy tables for inference and interpretation sections
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$z_hpt_total, "HPT total"),
  tidy_all(fits$z_hpt_cont, "CONT"),
  tidy_all(fits$z_hpt_pop, "POP")
)

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	Base	z_frlf_tot	-0.078	-0.260	0.103	0.396

dv	spec	term	estimate	conf.low	conf.high	p.value
HPT total	Base	z_ksa3_tot	0.204	0.024	0.383	0.027
HPT total	Base	z_kn_total	0.124	-0.033	0.281	0.121
HPT total	Base	z_sdr5_tot	0.103	-0.054	0.261	0.197
HPT total	Facet	z_frlf_rd	-0.136	-0.320	0.048	0.145
HPT total	Facet	z_frlf_ns	0.042	-0.137	0.220	0.645
HPT total	Facet	z_ksa3_tot	0.216	0.034	0.397	0.020
HPT total	Facet	z_kn_total	0.129	-0.029	0.287	0.109
HPT total	Facet	z_sdr5_tot	0.123	-0.038	0.283	0.133
HPT total	Interaction	z_frlf_tot	-0.082	-0.264	0.100	0.374
HPT total	Interaction	z_kn_total	0.110	-0.050	0.271	0.176
HPT total	Interaction	z_ksa3_tot	0.205	0.025	0.385	0.026
HPT total	Interaction	z_sdr5_tot	0.109	-0.049	0.268	0.174
HPT total	Interaction	z_frlf_tot:z_kn_total	-0.075	-0.248	0.097	0.389
CONT	Base	z_frlf_tot	-0.039	-0.219	0.141	0.669
CONT	Base	z_ksa3_tot	0.075	-0.104	0.255	0.408
CONT	Base	z_kn_total	0.231	0.076	0.386	0.004
CONT	Base	z_sdr5_tot	0.060	-0.096	0.215	0.451
CONT	Facet	z_frlf_rd	-0.130	-0.310	0.050	0.156
CONT	Facet	z_frlf_ns	0.086	-0.088	0.260	0.331
CONT	Facet	z_ksa3_tot	0.088	-0.092	0.268	0.337
CONT	Facet	z_kn_total	0.236	0.082	0.391	0.003
CONT	Facet	z_sdr5_tot	0.086	-0.072	0.244	0.283
CONT	Interaction	z_frlf_tot	-0.043	-0.223	0.137	0.639
CONT	Interaction	z_kn_total	0.218	0.060	0.377	0.007
CONT	Interaction	z_ksa3_tot	0.076	-0.104	0.256	0.404
CONT	Interaction	z_sdr5_tot	0.065	-0.091	0.222	0.413
CONT	Interaction	z_frlf_tot:z_kn_total	-0.068	-0.238	0.102	0.432
POP	Base	z_frlf_tot	-0.039	-0.213	0.134	0.654
POP	Base	z_ksa3_tot	0.173	0.002	0.344	0.048
POP	Base	z_kn_total	-0.329	-0.479	-0.179	0.000
POP	Base	z_sdr5_tot	0.096	-0.054	0.247	0.208
POP	Facet	z_frlf_rd	-0.031	-0.207	0.145	0.731
POP	Facet	z_frlf_ns	-0.022	-0.193	0.149	0.802
POP	Facet	z_ksa3_tot	0.176	0.003	0.349	0.046
POP	Facet	z_kn_total	-0.328	-0.479	-0.176	0.000
POP	Facet	z_sdr5_tot	0.092	-0.061	0.246	0.237
POP	Interaction	z_frlf_tot	-0.042	-0.216	0.133	0.638
POP	Interaction	z_kn_total	-0.337	-0.491	-0.184	0.000
POP	Interaction	z_ksa3_tot	0.174	0.002	0.345	0.047
POP	Interaction	z_sdr5_tot	0.100	-0.051	0.251	0.194

POP	Interaction	z_frlf_tot:z_kn_total	-0.044	-0.209	0.121	0.596
-----	-------------	-----------------------	--------	--------	-------	-------

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** 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 hypothesized, is significant in the expected direction).

Reading POP. Given our recoding (1–4 “fit”), higher **POP** here reflects stronger agreement that the presentism-trigger statements “fit” Hannes. In the original instrument, POP and CONT came out as a single factor vs. ROA in CFA, and item wording can trip respondents; interpret POP cautiously and triangulate with CONT.

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

- **Effect size:** Coefficients are **standardized** (β). 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 contextualization**, consistent with the contamination concern. Cite the HPT literature and the FR-LF validation when interpreting.
- **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

- **Instrument provenance.** HPT instrument and subscale logic follow Hartmann & Hasselhorn / Huijgen et al. (contextualization vs. presentism; known POP/CONT factor behavior; potential item-level ambiguities).
- **FR-LF-mini.** Items RD1–3 and NS1–3 originate from the Leipzig FR-LF, which shows a stable 6-factor structure and excellent internal consistency in representative samples.
- **Analysis plan.** This file implements the Stage 1 snapshot plan (multilevel regressions; DVs: HPT total, CONT, POP; predictors: FR-LF, KSA-3; controls: KN, SDR-5; class clustering).
- **Variable names and coding** are taken from the project codebook to ensure reproducibility.

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-gnublas/libblas.so.3.12.0
## LAPACK:  /usr/lib/x86_64-linux-gnulapack/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    tidyverse_2.0.0
## [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 parallely_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              htmtools_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

```

7.0.1 Minimal reporting template (paste into manuscript)

- **Model:** Random-intercept LMM (classes).
- **DV:** HPT total (z); robustness for CONT (z) and POP (z).
- **Predictors:** FR-LF total (z) or RD/NS facets (z); KSA-3 total (z); controls KN (z), SDR-5 (z).
- **Key result:** $\beta_{\text{FR-LF}} = \dots$, 95% CI $[\dots, \dots]$, $p = \dots$; ICC = \dots ; $R_m^2 = \dots$, $R_c^2 = \dots$
- **Decision:** H1 ... / H2 ... (per criteria above).

References for context: Huijgen et al. on HPT structure and presentism risks; FR-LF validation and dimensionality; Stage 1 snapshot for analytic plan; project codebook for variables.