Hypothesis tests — HPT (Czech data)

Multilevel models for H1–H2

HPT and Extremism project

2025-12-06

Contents

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)
```

```r
# ---- 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)
ksa_items <- c(a_items, u_items, k_items)

dat <- dat |>
  mutate(
    ksa3_a   = rowMeans(across(all_of(a_items)),   na.rm = TRUE),
```

```r
    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]])
```

```r
# 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 → 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)	−0.007	−0.012	−0.033
	(0.090)	(0.094)	(0.091)
z_frlf_tot	−0.114		−0.119
	(0.097)		(0.097)
z_ksa3_tot	0.251**	0.260**	0.256**
	(0.096)	(0.097)	(0.096)
z_kn_total	0.140+	0.143+	0.114
	(0.083)	(0.084)	(0.085)
z_sdr5_tot	0.106	0.126	0.120
	(0.083)	(0.085)	(0.083)
z_frlf_rd		−0.161	
		(0.098)	
z_frlf_ns		0.024	
		(0.095)	
z_frlf_tot × z_kn_total			−0.135
			(0.094)
SD (Intercept class_label)	0.105	0.129	0.104
SD (Observations)	0.967	0.967	0.964
Num.Obs.	141	140	141
R2 Marg.	0.079	0.087	0.092
R2 Cond.	0.090	0.103	0.102
RMSE	0.95	0.94	0.94

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

```r
# 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})",
  gof_omit = "IC|Log|AIC|BIC",
  stars = TRUE
)
```

```r
msummary(
  list(
```

	CONT — Base	CONT — Facet	CONT — Int.
(Intercept)	−0.028	−0.035	−0.050
	(0.109)	(0.110)	(0.112)
z_frlf_tot	−0.113		−0.117
	(0.096)		(0.096)
z_ksa3_tot	0.151	0.158	0.155
	(0.096)	(0.096)	(0.096)
z_kn_total	0.230**	0.233**	0.209*
	(0.082)	(0.082)	(0.084)
z_sdr5_tot	0.093	0.118	0.104
	(0.082)	(0.083)	(0.082)
z_frlf_rd		−0.170+	
		(0.095)	
z_frlf_ns		0.039	
		(0.093)	
z_frlf_tot × z_kn_total			−0.105
			(0.093)
SD (Intercept class_label)	0.215	0.217	0.220
SD (Observations)	0.945	0.941	0.943
Num.Obs.	141	140	141
R2 Marg.	0.088	0.098	0.095
R2 Cond.	0.133	0.144	0.142
RMSE	0.92	0.91	0.91

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

```
    "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)	0.003	0.009	−0.004
	(0.081)	(0.081)	(0.083)
z_frlf_tot	0.018		0.016
	(0.096)		(0.096)
z_ksa3_tot	0.130	0.136	0.132
	(0.094)	(0.095)	(0.094)
z_kn_total	−0.284***	−0.281***	−0.292***
	(0.082)	(0.083)	(0.084)
z_sdr5_tot	0.086	0.085	0.090
	(0.082)	(0.084)	(0.083)
z_frlf_rd		−0.019	
		(0.097)	
z_frlf_ns		0.034	
		(0.094)	
z_frlf_tot × z_kn_total			−0.040
			(0.094)
SD (Intercept class_label)	0.000	0.000	0.000
SD (Observations)	0.958	0.962	0.961
Num.Obs.	141	140	141
R2 Marg.	0.105	0.104	0.106
RMSE	0.94	0.94	0.94

+ 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_
```

```r
    )
  }, 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.
```

```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 — Base	0.012	0.079	0.090
HPT total — Facet	0.017	0.087	0.103
HPT total — Int.	0.011	0.092	0.102
CONT — Base	0.049	0.088	0.133
CONT — Facet	0.051	0.098	0.144
CONT — Int.	0.052	0.095	0.142
POP — Base	NA	0.105	NA
POP — Facet	NA	0.104	NA
POP — Int.	NA	0.106	NA

```r
# 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	-0.114	-0.306	0.078	0.241

dv	spec	term	estimate	conf.low	conf.high	p.value
HPT total	Base	z__ksa3__tot	0.251	0.061	0.440	0.010
HPT total	Base	z__kn__total	0.140	-0.024	0.305	0.095
HPT total	Base	z__sdr5__tot	0.106	-0.058	0.270	0.204
HPT total	Facet	z__frlf__rd	-0.161	-0.354	0.031	0.100
HPT total	Facet	z__frlf__ns	0.024	-0.164	0.212	0.803
HPT total	Facet	z__ksa3__tot	0.260	0.068	0.452	0.008
HPT total	Facet	z__kn__total	0.143	-0.022	0.308	0.090
HPT total	Facet	z__sdr5__tot	0.126	-0.041	0.293	0.139
HPT total	Interaction	z__frlf__tot	-0.119	-0.310	0.072	0.221
HPT total	Interaction	z__kn__total	0.114	-0.054	0.282	0.183
HPT total	Interaction	z__ksa3__tot	0.256	0.067	0.445	0.008
HPT total	Interaction	z__sdr5__tot	0.120	-0.045	0.284	0.153
HPT total	Interaction	z__frlf__tot:z__kn__total	-0.135	-0.322	0.052	0.154
CONT	Base	z__frlf__tot	-0.113	-0.302	0.076	0.240
CONT	Base	z__ksa3__tot	0.151	-0.039	0.340	0.118
CONT	Base	z__kn__total	0.230	0.068	0.393	0.006
CONT	Base	z__sdr5__tot	0.093	-0.069	0.255	0.256
CONT	Facet	z__frlf__rd	-0.170	-0.359	0.018	0.076
CONT	Facet	z__frlf__ns	0.039	-0.144	0.222	0.676
CONT	Facet	z__ksa3__tot	0.158	-0.032	0.348	0.102
CONT	Facet	z__kn__total	0.233	0.071	0.395	0.005
CONT	Facet	z__sdr5__tot	0.118	-0.046	0.282	0.157
CONT	Interaction	z__frlf__tot	-0.117	-0.306	0.072	0.223
CONT	Interaction	z__kn__total	0.209	0.043	0.375	0.014
CONT	Interaction	z__ksa3__tot	0.155	-0.034	0.344	0.108
CONT	Interaction	z__sdr5__tot	0.104	-0.059	0.267	0.209
CONT	Interaction	z__frlf__tot:z__kn__total	-0.105	-0.290	0.079	0.262
POP	Base	z__frlf__tot	0.018	-0.172	0.207	0.853
POP	Base	z__ksa3__tot	0.130	-0.056	0.316	0.168
POP	Base	z__kn__total	-0.284	-0.447	-0.122	0.001
POP	Base	z__sdr5__tot	0.086	-0.076	0.248	0.296
POP	Facet	z__frlf__rd	-0.019	-0.210	0.172	0.845
POP	Facet	z__frlf__ns	0.034	-0.153	0.220	0.721
POP	Facet	z__ksa3__tot	0.136	-0.051	0.324	0.154
POP	Facet	z__kn__total	-0.281	-0.445	-0.117	0.001
POP	Facet	z__sdr5__tot	0.085	-0.080	0.251	0.309
POP	Interaction	z__frlf__tot	0.016	-0.174	0.207	0.865
POP	Interaction	z__kn__total	-0.292	-0.459	-0.125	0.001
POP	Interaction	z__ksa3__tot	0.132	-0.055	0.318	0.164
POP	Interaction	z__sdr5__tot	0.090	-0.073	0.253	0.278

POP	Interaction	z_frlf_tot:z_kn_total	-0.040	-0.226	0.146	0.672

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** $\times$ **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

```r
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_2.5.1
## [64] textshaping_0.4.1   Rdpack_2.6.4        evaluate_1.0.1
## [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:** $\beta_{\text{FR-LF}}$ = ..., 95% CI [... , ...], p = ...; ICC = ...; R^2_m = ..., R^2_c = ...
- **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.