
title: "Local effects of Denmark's red dyslexia classification on conviction and school disengagement" subtitle: "Outcome-blind preregistration report" date: "2026-09-04T17:00:00Z"

Registration boundary

- Research ID: `dyslexia_cutoff_justice_contact`
- Mode: `given_rq`
- Version: 2
- Knowledge cutoff: 2026-09-04T17:00:00Z
- Outcome data accessed: **no**

Research scope

Question. Among pupils taking Denmark's National Dyslexia Test near its official red-versus-yellow score cutoff, what is the local intention-to-treat effect of receiving the dyslexic red classification on subsequent criminal conviction and school disengagement?

Primary estimand. The retained-pupil-weighted finite-window risk difference in cause-1 cumulative incidence of first qualifying conviction before age 21 under red rather than yellow assignment, with death competing and emigration or register end censoring, among first-tested pupils in retained rule strata.

Population and setting. PNR-linkable pupils at their first eligible National Dyslexia Test in a date, version, and education-level stratum with an authoritative unique red-yellow rule and two-sided score support. Unit: Pupil at first eligible test.. Setting: Denmark's indicated National Dyslexia Test and linked administrative registers.. Period: Tests in 2014-2025; conviction from test through the instant before age 21; STIL absence over the 24 complete calendar months after the test month; and education exit during post-test days 1-730..

Inferential ceiling. If all gates pass, a local intention-to-treat effect of the red classification-and-eligibility bundle among tested marginal pupils; never an effect of dyslexia, testing, one service, mediation, or all pupils.

Theory and contribution

Focal mechanism. Red classification changes access to a bundle of accommodations, supports, expectations, and stigma; these responses may improve engagement and reduce later conviction, although opposing labeling mechanisms are possible.

Rival mechanisms.

- Stigma or lowered expectations may increase disengagement or conviction risk.
- Selection into testing limits transport and may change composition smoothly or discontinuously near the cutoff.
- Score manipulation, coarse mass points, code changes, or differential observability can create apparent discontinuities.

Contribution. A bounded same-cutoff extension to subsequent recorded conviction, with school absence and education exit as separate secondary replication or pathway outcomes.

Question-to-output map

Question

Can first-tested pupils near the official red-yellow cutoff support the registered local contrast?

What is the local intention-to-treat effect of red classification on subsequent criminal conviction before age 21?

What is the local intention-to-treat effect of red classification on STIL absence over the 24 complete calendar months?

What is the local intention-to-treat effect of red classification on education exit without completion during post-test?

Execution governance

Authority. This YAML, hashed source documentation, and version-locked code are the exclusive execution authority; outcomes cannot resolve design choices.

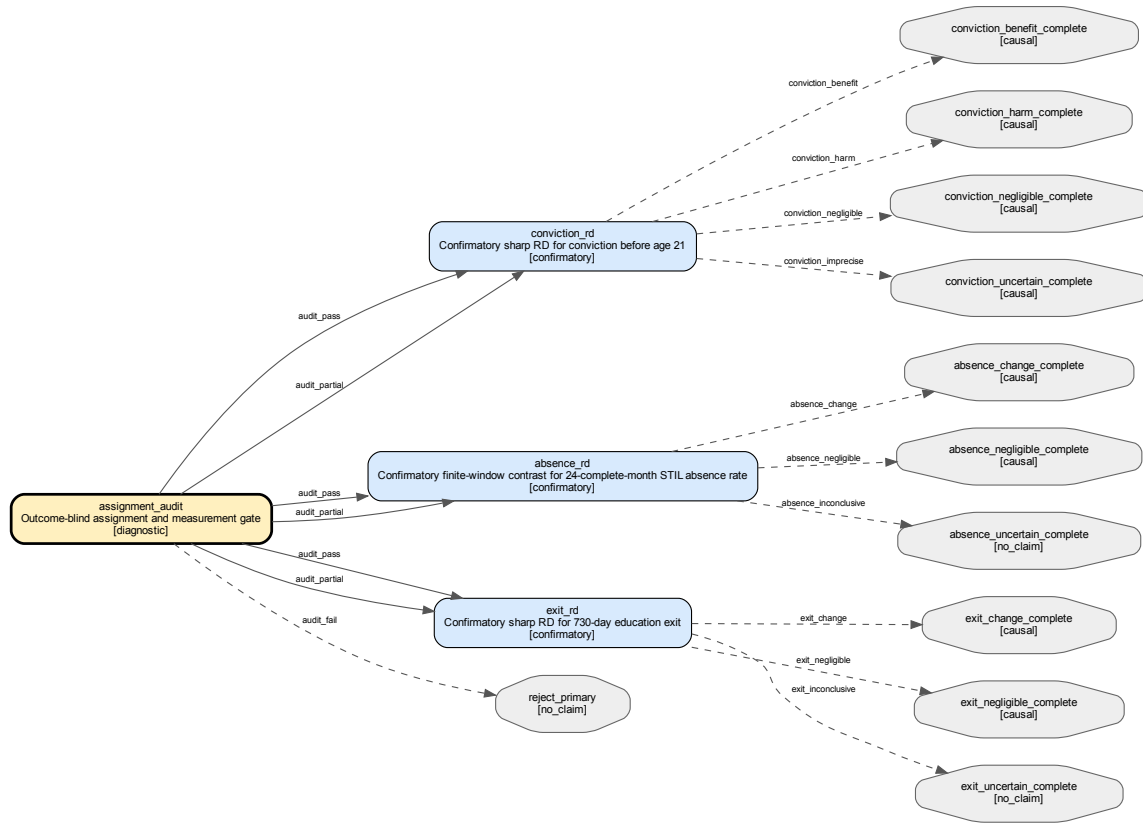
Execution order. assignment_audit -> conviction_rd -> absence_rd -> exit_rd

Environment. R 4.5.x; R 4.5.x, riskRegression 2025.x, prodlim 2025.x, fixest 0.13.x, rdlocrand 1.1.x, arrow 19.x, data.table 1.17.x. Capture: Save renv.lock, sessionInfo(), package source hashes, code commit, and all lookup-table hashes before unlocking outcomes. Seed: Use integer seed 20260904 for synthetic data and any randomized tie-breaking; actual records use deterministic sorting only. Time zone: Europe/Copenhagen. Locale: C.UTF-8.

Data-access sequence. Build synthetic tests; freeze and hash documentation; run assignment and measurement audit without KRAF or post-test school values; then disclose only masked support totals; unlock each outcome table only after its gate passes.

Failure policy. Failed assertions stop the affected experiment and downstream claims; they never authorize a proxy outcome, changed horizon, uncontrolled association, or analyst-selected bandwidth.

Experiment graph



assignment_audit: Outcome-blind assignment and measurement gate

Epistemic role: **diagnostic**. Determine which causal outcome experiments, if any, may execute without inspecting treatment-specific outcomes.

Activation. Run when Always first.; skip when Never..

Hypothesis. The exact cutoff and measurement chains support at least the conviction RD.

Design and estimand. rdd; No outcome estimand; a deterministic Boolean audit of whether the registered local contrast and each outcome measurement chain are executable.

Identifying variation. Pupil's own first-test SCORE crossing a documented version-date-level red-yellow cutoff, inspected without outcome values.

Counterfactual. Near-cutoff first-tested pupils must have two-sided support and continuous pre-determined composition and observability.

Analysis. rdrobust::rdrobust and rddensity::rddensity for diagnostic discontinuities.: Local linear, triangular kernel, fixed ordered h candidates, stratum fixed effects, and side-specific slopes.

Pseudocode execution plan

Closed identity. Can first-tested pupils near the official red-yellow cutoff support the registered local contrast? -> No outcome estimand; a deterministic Boolean audit of whether the registered local contrast and each outcome measurement chain are executable. -> `all_gates_pass` -> `conviction_gate` Boolean plus `absence_gate` and `exit_gate` Booleans -> `audit_decision`.

Sources

ID	Resource and tables
test_source	fsv_complete_catalog: UDD_ORDBLINDETEST
baseline_source	fsv_complete_catalog: BEF, UDSP, UDDINST
assignment_authority	fsv_complete_catalog: authoritative ministry test manual and version-level cutoff annex
kraf_authority	fsv_complete_catalog: Statistics Denmark KRAF codebook and annual value labels
observation_authority	fsv_complete_catalog: BEF, FLYT, DOD, KOTRE, UDD_FOLKESKOLE_FRAVAER

Variable construction `centered_score_audit` (`running_variable`, `pupil`).

Sources: SCORE, DATO, UDDANNELSESNIVEAU. Time: Use first eligible test only. Missingness: Exclude missing or nonunique mapping.

1. Join the hashed authoritative version-date-level cutoff table.
2. Orient SCORE so smaller values are red and subtract cutoff.

`assignment_gate` (`statistic`, `rule stratum`).

Sources: SCORE, TESTRESULTAT, TESTRESULTATNIVEAU, DATO, UDDANNELSESNIVEAU. Time: Before outcomes. Missingness: Missing or conflicting authority mapping is false.

1. Map DATO and education level to exactly one authority row.
2. Compute score-implied class using documented precision direction cutoff and inclusive side on the same test record.
3. Pass iff 100% of nonmissing recorded classes equal implied classes and no earliest same-day conflict remains; otherwise exclude the stratum, and fail all assignment if none remain.

`linkage_gate` (`statistic`, `rule stratum` and `side`).

Sources: PNR, REFERENCETID. Time: Pre-test linkage only. Missingness: Missing validity code or zero denominator is false.

1. Define eligible denominator as first tests with syntactically valid PNR under authoritative CPRTYPE and CPRTJEK predicates.
2. Compute `linked_share=count` with exactly one pre-test BEF match/eligible denominator by stratum-side.
3. Pass iff every share is at least 0.95 and the absolute red-yellow difference is at most 0.02.

`measurement_gates` (`statistic`, `outcome` and `rule stratum`).

Sources: AFG_STATUS, AFG_AFGTYP3, AFG_GER7, AFG_AFGOEDTO, MAANED, DAGEIALTFRA, DAGEAKTIV, AFG_ART, AUDD. Time: Rules and coverage are fixed before

outcome contrasts. Missingness: Unknown code, absent month, zero total active-day denominator, conflict, or undocumented additivity is false for that outcome.

1. Justice passes only if every effective KRAF code maps uniquely and same-day conviction/death/emigration ties are absent in synthetic and real metadata; any real tie stops justice without inspecting its assignment side.
2. Absence passes only if MAANED parses uniquely, all 24 required months fall inside STIL coverage, duplicate pupil-month-institution keys are exact duplicates, concurrent rows are documented additive, and numerator and denominator are nonnegative with numerator no greater than denominator.
3. Exit passes only if every AFG_ART and AUDD value has one completion/noncompletion mapping and KOTRE covers all 730 days.

discrete_support_gate (statistic, candidate lattice window).

Sources: SCORE, INSTNR, FOED_DAG, KOEN, IE_TYPE. Time: No outcomes. Missingness: Missing lattice or covariate becomes explicit category; missing score fails record.

1. Enumerate unique documented score cells and symmetric candidate windows from smallest outward.
2. Run 100000-draw Fisher difference-in-counts manipulation test and identical tests for age sex and origin; seed 20260904 and tie ordering manipulation age sex origin.
3. Holm-adjust all four p-values and retain only windows with every adjusted p greater than 0.05 two occupied cells per side and full-rank design.

masked_power_gate (statistic, candidate window and outcome).

Sources: SCORE, INSTNR. Time: Only masked overall prevalence rounded to 0.01 may enter; no side-specific outcome statistic. Missingness: Absent prevalence token or inadmissible probability scenario fails the outcome gate.

1. For each retained window generate 10000 null datasets and 10000 SESOI datasets on observed masked score cells and institution IDs using $Y^* = b_0 + b_1X + b_2X^2 + b_3X^3 + u_{\text{institution}} + \text{error}$, with $b = (0, 0.25, -0.10, 0.05)$, standardized total variance 1, ICC grid 0, 0.05, 0.10, 0.20, and Bernoulli outcomes formed by logistic calibration to masked overall prevalence supplied only as one value rounded to 0.01.
2. For school continuous rate use Gaussian Y^* truncated to $[0, 1]$; for binary exit and cause-1 conviction use Bernoulli; add the numeric SESOI to red potential risk/rate on the probability scale with clipping forbidden and discard a scenario if any probability leaves $[0.01, 0.99]$.
3. Run the exact registered estimator for each replicate; type-I error is rejection share under null and power is rejection share at SESOI. Pass iff for every ICC and admissible baseline scenario type-I error ≤ 0.06 power ≥ 0.80 and Monte Carlo standard error ≤ 0.005 ; select the smallest passing window.

all_gates_pass (statistic, run).

Sources: SCORE, TESTRESULTAT, PNR, REPERENCETID, AFG_STATUS, MAANED, AFG_ART. Time: Before outcome-effect unlock. Missingness: Any indispensable unresolved input is false.

1. conviction_gate=any common stratum passing assignment linkage discrete support KRAF event ordering censoring positivity and masked conviction power.

2. `absence_gate`=conviction-independent conjunction of assignment linkage discrete support STIL coverage/additivity and masked absence power.
3. `exit_gate`=conjunction of assignment linkage discrete support KOTRE mapping/coverage and masked exit power.
4. Emit one Boolean and first failing reason in fixed precedence assignment linkage support manipulation mapping coverage ordering positivity power.

Equation or algorithm

For each diagnostic Z fit $Z_i = \alpha + \tau * D_i + \beta_{\text{minus}} * X_i + \beta_{\text{plus}} * D_i * X_i + \text{stratum_FE} + \text{error}_i$

Target statistic: `conviction_gate` Boolean plus `absence_gate` and `exit_gate` Booleans. Estimator/API: `rdrobust::rdrobust(y=Z,x=X,c=0,p=1,kernel="triangular",h=h,vce="cluster",cluster=INSTNR)`

Weights: Triangular kernel $\max(0, 1 - |X|/h)$, multiplied by equal retained-stratum weights. Fixed effects: Version-date-level stratum indicators. References: Yellow D=0 and positive-score side.

Uncertainty: Robust bias-corrected 95% intervals and Holm alpha 0.05 across density and seven balance tests. Clustering: First-test INSTNR.

Ordered actions a01 — Freeze authoritative rules and dry-run fixtures.

Consumes: `test_source`, `assignment_authority`, `kraf_authority`, `observation_authority`. Produces: `rule_manifest`.

1. Select documents by the registered issuer/date precedence, record URL or catalog path, issuer.
2. Compile explicit cutoff, KRAF final-conviction, emigration, STIL, and exit lookup rows and 1

Assertions: Every lookup row has one source and validity interval.; All synthetic expected Booleans and reasons match exactly.

Failure route: `mark_infeasible` — Set affected gate false; no analyst reconciliation or substitute source.

a02 — Construct first tests and rule strata.

Consumes: `test_source`, `rule_manifest`. Produces: `audit_sample`.

1. Sort by PNR,DATO,INSTNR,SCORE,TESTRESULTAT; collapse byte-identical rows and retain earliest
2. Exclude a pupil when earliest same-day rows differ on any assignment field; map remaining r

Assertions: One row per PNR.; Every row has one authority mapping and implied class equals recorded class.

Failure route: `stop_experiment` — Fail assignment and stop all downstream work.

a03 — Compute linkage, support, manipulation, and balance gates.

Consumes: `audit_sample`, `baseline_source`. Produces: `diagnostic_results`.

1. Compute linkage shares and exact boundary comparisons; enumerate lattice windows in increas
2. For every window run the 100000-draw Fisher tests, Holm algorithm, rank and support assertio

Assertions: Every eligible window has four raw and adjusted p-values.; No outcome table was read.

Failure route: `mark_infeasible` — Set discrete-support gate false.

a04 — Compute source and event-history measurement gates.

Consumes: rule_manifest, observation_authority, kraf_authority. Produces: measurement_results.

1. Apply the exact same-record KRAF predicate and event priority rules to synthetic histories,
2. Verify STIL 24-month availability/additivity and KOTRE mapping/730-day coverage; compute fi

Assertions: Every source gate has a Boolean and fixed reason.; Death is competing, never censoring; emigration and register end are censoring.

Failure route: skip_downstream — Set only the affected outcome gate false.

a05 — Calibrate exact estimators using masked simulations.

Consumes: audit_sample, diagnostic_results, measurement_results. Produces: power_results.

1. Receive only overall prevalence rounded to 0.01 through the firewall and simulate the compl
2. Compute type-I error, SESOI power, and MCSE from 10000 replicates per state; choose the sma

Assertions: No side-specific outcome count or effect is present.; All operating-characteristic cells meet boundary rules for a pass.

Failure route: skip_downstream — Set affected power gate false.

a06 — Emit deterministic activation decision.

Consumes: diagnostic_results, measurement_results, power_results, rule_manifest. Produces: audit_decision.

1. Combine gates using the registered conjunctions and failure-reason precedence.
2. Write immutable decision and hash every consumed artifact.

Assertions: Exactly one audit decision is emitted.; Every false component maps to exclusion, skipped outcome, or primary abandonment.

Failure route: skip_downstream — Emit audit_fail and no outcome claim.

Output contract

Output	Path	Grain	Required
rule_manifest	preregistration/run/audit/rule_manifest.json	rule file	path, sh
audit_sample	preregistration/run/audit/audit_sample.parquet	pupil	PNR_ha
diagnostic_results	preregistration/run/audit/diagnostics.parquet	diagnostic	diagnost
measurement_results	preregistration/run/audit/measurement.json	outcome gate	outcome
power_results	preregistration/run/audit/power.parquet	window-outcome-ICC-state	window_
audit_decision	preregistration/run/audit/decision.json	run	convictio

Procedure accounting

- **fisher_gate_tests**: 4 calls per unit $\times$ 1 fitted units $\times$ 100000 repetitions = 400000 fits. Four Fisher randomization tests per candidate window; the operation repeats for each enumerated window and the run log records window count separately.

- **masked_null_and_sesoi_simulations:** 2 calls per unit $\times$ 4 fitted units $\times$ 10000 repetitions = 80000 fits. Null and SESOI states for four ICC values per outcome-window; outcome and window counts are reported as separate full procedure multipliers in `power_results`.
- Full-data passes: 5. Largest intermediate: `audit_sample` with one row per first-tested pupil.

Synthetic dry run. Run all transformations and branches on generated records containing exact cutoff ties, repeats, censoring, no events, and forced failures before any real outcome access.

Reconciliation. Counts reconcile from raw tests through exclusions to the audit sample; gate JSON hashes the diagnostic and rule manifests.

Decision regions.

- **audit_pass** (`descriptive_only`): `conviction_gate=true` and `absence_gate=true` and `exit_gate=true` — Activate all three outcome experiments.
- **audit_partial** (`descriptive_only`): `conviction_gate=true` and exactly one or both school gates=false — Activate conviction and each passing school experiment; unsupported school claims terminate.
- **audit_fail** (`feasibility_failure`): `conviction_gate=false` — Reject the primary candidate and do not substitute school outcomes.

conviction_rd: Confirmatory sharp RD for conviction before age 21

Epistemic role: **confirmatory**. Estimate the primary local classification-regime ITT on subsequent qualifying conviction.

Activation. Run when `audit_pass` or `audit_partial` with `conviction_gate=true`.; skip when `conviction_gate=false`..

Hypothesis. Red assignment changes conviction risk before age 21.

Design and estimand. `rdd`; The retained-pupil-weighted finite-window risk difference in cause-1 cumulative incidence of first qualifying conviction before age 21 under red rather than yellow assignment, with death competing and emigration or register end censoring, among first-tested pupils in retained rule strata.

Identifying variation. Individual pupil's first-test score crossing the verified cutoff.

Counterfactual. Conviction under yellow assignment for a pupil infinitesimally on the red side, represented by yellow-side pupils at the same cutoff.

Analysis. Stratum-specific Aalen-Johansen cause-1 cumulative incidence with IPCW censoring model and retained-pupil weighted aggregation.: Time zero is DATO. Cause 1 is first qualifying conviction; cause 2 is death. First emigration and KRAF administrative end censor; event-free age 21 closes follow-up. Stratum estimates are aggregated with $w_s = N_s / \sum N_s$.

Pseudocode execution plan

Closed identity. What is the local intention-to-treat effect of red classification on subsequent criminal conviction before age 21? -> The retained-pupil-weighted finite-window risk difference in cause-1 cumulative incidence of first qualifying conviction before age 21 under red rather than yellow assignment, with death competing and emigration or register end censoring, among first-tested

pupils in retained rule strata. -> conviction_by_21_var -> tau_conviction risk difference
-> conviction_primary.

Sources

ID	Resource and tables	Fields
audited_source	fsv_complete_catalog: UDD_ORDBLINDETEST	PNR, DATO, SCORE, INSTNR, UDD
conviction_source	fsv_complete_catalog: KRAF	PNR, AFG_AFGOEDTO, AFG_AFG
censor_source	fsv_complete_catalog: BEF, DOD	PNR, REFERENCETID, SENESTE

Variable construction **running_conviction (running_variable, pupil).**

Sources: SCORE, DATO, UDDANNELSESNIVEAU. Time: First eligible test. Missingness: Exclude and fail reconciliation.

1. Read centered_score and selected_h from immutable audit.
2. Verify absolute score does not exceed selected_h.

conviction_by_21_var (outcome, pupil).

Sources: DATO, AFG_AFGOEDTO, AFG_AFGTYP3, AFG_AFGTYPKO, AFG_STATUS, AFG_GER9, FOED_DAG, DODDATO, REFERENCETID. Time: Strictly post-test through day before age 21. Missingness: Unknown observability is censoring and prevents binary risk definition; unknown codes fail.

1. Compute age-21 date and observation end.
2. Filter KRAF rows by frozen status decision offence map on the same record.
3. Retain decisions after DATO and before minimum age-21 observation end and set indicator one; otherwise zero only with verified observation.

Equation or algorithm

For each stratum s , estimate censoring survival $G_i(t)$ from pooled person-month cloglog censor:

Target statistic: **tau_conviction risk difference**. Estimator/API: riskRegression::ate(event=prodlim::Hist(tim
treatment="red_assignment", data=conviction_sample, times=horizon_days, cause=1,
estimator="Aalen-Johansen", censoring="cox", formula.censoring=~red_assignment+score_cell+stratum_id+se
extract stratum-standardized contrasts; $w_s = \text{table(stratum_id)}/\text{nrow(conviction_sample)}$;
 $\tau = \sum(w_s * \tau_s)$; repeat complete pipeline in 9999 institution bootstrap draws stratified by
stratum and side.

Weights: IPCW $1/G_i(t-)$ inside each stratum, never truncated; aggregation $w_s = N_s / \sum N_s$
from retained audit pupils. Stop if any $G < 0.10$ or effective $N = (\sum w)^2 / \sum (w^2) < 0.25$ times
uncensored N . Fixed effects: Rule-stratum indicators, score-cell indicators, red assignment, sex,
birth cohort, and origin only in the censoring model; no post-assignment variable and no unde-
fined matrix. References: Yellow D=0; lowest centered score cell; earliest rule stratum; registered
authority code order for sex and origin; earliest birth cohort.

Uncertainty: 9999 institution bootstrap draws; percentile 2.5% and 97.5% quantiles. Failed draw
rate must be ≤ 0.01 ; otherwise no estimate. Clustering: INSTNR primary; unique centered-score
mass point robustness.

Ordered actions a01 — Construct frozen conviction outcome and follow-up.

Consumes: audited_source, conviction_source, censor_source. Produces: conviction_sample.

1. Join KRAF, DOD, and residence histories to every audited pupil without restricting on future
2. Apply final-conviction predicate on the same KRAF record; set status 1 when conviction is s

Assertions: One row per pupil and binary outcome has verified observation.

Failure route: mark_infeasible — Stop conviction experiment and report no causal estimate.

a02 — Fit the primary and registered robustness models.

Consumes: conviction_sample. Produces: conviction_fits.

1. Fit the declared censoring and Aalen-Johansen pipeline separately by rule stratum, calculate
2. Generate 9999 institution bootstrap draws stratified by stratum and side, refit the complete

Assertions: $\sum(w_s)=1$ within $1e-12$ and each $w_s=N_s/\sum(N_s)$ within $1e-12$.; Every $G \geq 0.10$, effective N threshold passes, at least 30 institutions exist, and failed bootstrap share ≤ 0.01 .

Failure route: stop_experiment — Mark primary inference infeasible without estimator substitution.

a03 — Emit compact primary results and decision fields.

Consumes: conviction_fits. Produces: conviction_primary.

1. Extract tau standard error confidence bounds p-value effective N bandwidth and diagnostics.
2. Classify the result using fixed zero and 0.02 boundaries and write immutable output.

Assertions: Decision classification recomputes exactly from output fields.

Failure route: downgrade_claim — Report implementation failure and no outcome claim.

Output contract

Output	Path	Grain	Required fields
conviction_sample	preregistration/run/conviction/sample.parquet	pupil	PNR_hash, centered_s
conviction_fits	preregistration/run/conviction/fits.rds	fitted procedure	procedure_id, tau_con
conviction_primary	preregistration/run/conviction/primary.json	estimand	tau_conviction, ci_low

Procedure accounting

- conviction_full_pipeline: 1 calls per unit $\times$ 1 fitted units $\times$ 10000 repetitions = 10000 fits. One observed-data pipeline plus 9999 complete bootstrap pipeline refits; each call returns every stratum estimate and the frozen weighted aggregate.
- Full-data passes: 4. Largest intermediate: Pupil-by-KRAF-decision joined table before collapse..

Synthetic dry run. Synthetic pupils exercise cutoff ties, same-day outcomes, death, emigration, age 21, and every decision region.

Reconciliation. Sample counts and event indicators reconcile to filtered KRAF rows and audit eligibility; primary JSON reconciles to saved fit object.

Decision regions.

- **conviction_benefit** (supports): $ci_high < 0$ and $\tau_conviction \leq -0.02$ — Evidence supports a beneficial local effect at least as large as the SESOI.
- **conviction_harm** (challenges): $ci_low > 0$ and $\tau_conviction \geq 0.02$ — Evidence supports a harmful local effect at least as large as the SESOI.
- **conviction_negligible** (null equivalent): $ci_low > -0.02$ and $ci_high < 0.02$ — Effects of policy-relevant magnitude in either direction are excluded.
- **conviction_imprecise** (inconclusive): All remaining valid-fit cases; implementation failure instead terminates at `no_claim`. — Direction or magnitude remains inconclusive.

absence_rd: Confirmatory finite-window contrast for 24-complete-month STIL absence rate

Epistemic role: **confirmatory**. Estimate the separate secondary local ITT on school absence.

Activation. Run when `audit_pass` or `audit_partial` with `absence_gate=true`; skip when `absence_gate=false`.

Hypothesis. Red assignment changes absence days per active day.

Design and estimand. `rdd`; The retained-pupil-weighted finite-window difference in STIL total absence days per active school day over the 24 complete calendar months after the test month under red rather than yellow assignment.

Identifying variation. Individual first-test score crossing the verified cutoff.

Counterfactual. Absence rate under yellow assignment for a marginal red-side tested pupil.

Analysis. `rdrobust::rdrobust` local-linear sharp RD.: Continuous absence rate with triangular weights and side-specific slopes at `selected_h`.

Pseudocode execution plan

Closed identity. What is the local intention-to-treat effect of red classification on STIL absence over the 24 complete calendar months after the test month? -> The retained-pupil-weighted finite-window difference in STIL total absence days per active school day over the 24 complete calendar months after the test month under red rather than yellow assignment. -> `absence_rate_var` -> `tau_absence` rate difference -> `absence_primary`.

Sources

ID	Resource and tables	Fields
<code>absence_audit_source</code>	<code>fsv_complete_catalog: UDD_ORDBLINDETEST</code>	PNR, DATO, SCORE
<code>absence_source</code>	<code>fsv_complete_catalog: UDD_FOLKESKOLE_FRAVAER_STIL</code>	PNR, MAANED, D

Variable construction `running_absence` (`running_variable`, `pupil`).

Sources: SCORE. Time: First test. Missingness: Exclude and fail reconciliation.

1. Read immutable centered score.
2. Verify selected bandwidth membership.

absence_rate_var (outcome, pupil).

Sources: DATO, MAANED, DAGEIALTFRA, DAGEAKTIV, INSTITUTIONSNUMMER. Time: Twenty-four complete post-test calendar months; test month excluded. Missingness: Missing month, nonadditive overlap, missing value, or zero denominator fails absence for the study.

1. Parse MAANED and retain exactly months 1 through 24 after the test month.
2. Collapse exact duplicate pupil-month-institution rows; any nonidentical duplicate fails.
3. Sum documented-additive DAGEIALTFRA and DAGEAKTIV across institutions and months.
4. Set ratio=sum(DAGEIALTFRA)/sum(DAGEAKTIV) only when all 24 months are present and denominator>0; otherwise fail the pupil and, because this is post-assignment selection, fail the entire outcome gate rather than complete-case restrict.

Equation or algorithm

Within every retained stratum s fit $Y_i = \alpha_s + \tau_s D_i + \beta_s X_i + \gamma_s (D_i X_i) + \text{error}_i$

Target statistic: `tau_absence rate difference`. Estimator/API: `fit=fixest::feols(absence_rate_var ~ 0 + i(stratum_id,red_assignment,ref=0) + i(stratum_id,centered_score) + i(stratum_id,I(red_assignment centered_score)) | data=absence_rd_sample, weights=~1, cluster=~INSTNR); tau_s=coef red terms; w_s=table(stratum_id)/nrow(data); tau_absence=sum(w_s tau_s); covariance=fixest::vcov(fit,cluster=~INSTNR); se=sqrt(t(w)%%V_tau%%w)`

Weights: Observation weights are 1. Aggregation weights are exactly $w_s = N_s / \sum_r N_r$ from the immutable audited analysis sample; no cutoff-density or equal-stratum weighting. Fixed effects: Fully interacted rule-stratum intercepts and stratum-specific centered-score slopes on each side; no baseline covariate matrix. References: Yellow `red_assignment=0` within every rule stratum; `centered_score=0`.

Uncertainty: Marginal cluster-robust covariance by first-test institution. For the school family with m activated outcomes, Bonferroni simultaneous interval is estimate $\pm \text{qnorm}(1-0.05/(2m))SE$ and `adjusted_p=min(1,m2*pnorm(-abs(estimate/SE)))`. Clustering: INSTNR primary; score mass point robustness.

Ordered actions a01 — Construct the 24-complete-month STIL absence rate.

Consumes: `absence_audit_source`, `absence_source`. Produces: `absence_sample`.

1. Verify gate and source hash then apply one frozen source-specific algorithm.
2. Aggregate in-window absence and active days and form the rate only for positive denominators.

Assertions: One row per pupil and rate lies in zero to one.

Failure route: `mark_infeasible` — Terminate absence experiment without substituting exit.

a02 — Fit registered absence models.

Consumes: `absence_sample`. Produces: `absence_fits`.

1. Fit the saturated stratum-specific finite-window model with exactly unit observation weights.
2. Compute N_s , w_s , weighted point estimate, covariance contrast, raw p , Bonferroni adjusted p .

Assertions: All stratum coefficients are finite, $\sum(w_s)=1$ within $1e-12$, and every w_s equals $N_s/\sum(N_s)$ within $1e-12$.; Multiplicity m is 1 or 2 and equals activated school outcomes.

Failure route: **stop_experiment** — Report absence inference infeasible.

a03 — Write compact absence result.

Consumes: `absence_fits`. Produces: `absence_primary`.

1. Extract target statistic interval and diagnostics.
2. Apply fixed decision regions and save immutable JSON.

Assertions: Output decision recomputes exactly.

Failure route: **downgrade_claim** — Report no school-absence claim.

Output contract

Output	Path	Grain	Required fields
<code>absence_sample</code>	<code>preregistration/run/absence/sample.parquet</code>	pupil	PNR_hash, centered_score,
<code>absence_fits</code>	<code>preregistration/run/absence/fits.rds</code>	fitted procedure	procedure_id, estimate, stan
<code>absence_primary</code>	<code>preregistration/run/absence/primary.json</code>	estimand	tau_absence, standard_err

Procedure accounting

- **absence_primary_fit**: 1 calls per unit $\times$ 1 fitted units $\times$ 1 repetitions = 1 fits. One primary absence outcome.
- **absence_robustness_fits**: 1 calls per unit $\times$ 6 fitted units $\times$ 1 repetitions = 6 fits. Two clustering choices by three bandwidths.
- Full-data passes: 4. Largest intermediate: Pupil-by-school-period absence table..

Synthetic dry run. Synthetic monthly and dated records test boundary days noncoverage zero denominators and both source algorithms.

Reconciliation. Pupil totals reconcile to retained source records and JSON to fit object.

Decision regions.

- **absence_negligible** (null_equivalent): Valid fit and $\text{sim_ci_low} \geq -0.02$ and $\text{sim_ci_high} \leq 0.02$; evaluated first. — The simultaneous interval is contained in the SESOI bounds.
- **absence_change** (supports): Valid fit, negligible condition false, and $\text{adjusted_p} \leq 0.05$; evaluated second. — Evidence supports a nonzero local effect in the estimate sign, without an automatic SESOI claim.
- **absence_inconclusive** (inconclusive): All remaining cases, including $\text{adjusted_p} > 0.05$, an interval crossing a SESOI bound, or implementation failure; evaluated last. — Evidence is inconclusive or execution failed.

exit_rd: Confirmatory sharp RD for 730-day education exit

Epistemic role: **confirmatory**. Estimate the separate secondary local ITT on education exit without completion.

Activation. Run when `audit_pass` or `audit_partial` with `exit_gate=true`.; skip when `exit_gate=false`..

Hypothesis. Red assignment changes education-exit risk.

Design and estimand. rdd; The retained-pupil-weighted finite-window risk difference in education exit without completion during post-test days 1-730 under red rather than yellow assignment.

Identifying variation. Individual first-test score crossing the verified cutoff.

Counterfactual. Exit risk under yellow assignment for a marginal red-side tested pupil.

Analysis. `rdrobust::rdrobust` local-linear sharp RD.: Binary exit risk with triangular weights and side-specific slopes at `selected_h`.

Pseudocode execution plan

Closed identity. What is the local intention-to-treat effect of red classification on education exit without completion during post-test days 1-730? -> The retained-pupil-weighted finite-window risk difference in education exit without completion during post-test days 1-730 under red rather than yellow assignment. -> `exit_730_var` -> `tau_exit` risk difference -> `exit_primary`.

Sources

ID	Resource and tables	Fields
<code>exit_audit_source</code>	<code>fsv_complete_catalog: UDD_ORDBLINDETEST</code>	PNR, DATO, SCORE, INSTNR, UDD
<code>exit_source</code>	<code>fsv_complete_catalog: KOTRE</code>	PNR, ELEV3_VFRA, ELEV3_VTIL

Variable construction `running_exit` (`running_variable`, `pupil`).

Sources: SCORE. Time: First test. Missingness: Exclude and fail reconciliation.

1. Read immutable centered score.
2. Verify selected bandwidth membership.

`exit_730_var` (`outcome`, `pupil`).

Sources: DATO, ELEV3_VTIL, AFG_ART, AUDD. Time: Days 1-730 after test. Missingness: Unknown code or coverage fails the experiment.

1. Filter spell ends to days 1-730 on the same record.
2. Apply frozen AFG_ART and AUDD completion map.
3. Set one if any qualifying noncompletion exit and otherwise zero only under verified coverage.

Equation or algorithm

Within every retained stratum s fit $Y_i = \alpha_s + \tau_s D_i + \beta_s X_i + \gamma_s (D_i X_i) + \text{error}_i$

Target statistic: `tau_exit` risk difference. Estimator/API: `fit=fixest::feols(exit_730_var ~ 0 + i(stratum_id, red_assignment, ref=0) + i(stratum_id, centered_score) + i(stratum_id, I(red_assignment * centered_score), data=exit_rd_sample, weights=~1, cluster=~INSTNR); tau_s=coef red terms; w_s=table(stratum_id)/nrow(data); tau_exit=sum(w_s tau_s); covariance=fixest::vcov(fit, cluster=~INSTNR); se=sqrt(t(w) %>% V_tau %>% w)`

Weights: Observation weights are 1. Aggregation weights are exactly $w_s = N_s / \sum_r N_r$ from the immutable audited analysis sample; no cutoff-density or equal-stratum weighting. Fixed effects: Fully interacted rule-stratum intercepts and stratum-specific centered-score slopes on each side; no baseline covariate matrix. References: Yellow red_assignment=0 within every rule stratum; centered_score=0.

Uncertainty: Marginal cluster-robust covariance by first-test institution. For the school family with m activated outcomes, Bonferroni simultaneous interval is estimate $\pm qnorm(1-0.05/(2m))SE$ and $adjusted_p = \min(1, m2 * pnorm(-abs(estimate/SE)))$. Clustering: INSTNR primary; score mass point robustness.

Ordered actions a01 — Construct the 730-day exit indicator.

Consumes: exit_audit_source, exit_source. Produces: exit_sample.

1. Verify gate and lookup hash before reading spell outcomes.
2. Apply same-record window and completion predicates then collapse to one pupil.

Assertions: One row per pupil and every event traces to one spell.

Failure route: mark_infeasible — Terminate exit experiment without substituting absence.

a02 — Fit registered exit models.

Consumes: exit_sample. Produces: exit_fits.

1. Fit the saturated stratum-specific finite-window model with exactly unit observation weights.
2. Compute N_s , w_s , weighted point estimate, covariance contrast, raw p , Bonferroni adjusted p .

Assertions: All stratum coefficients are finite, $\sum(w_s)=1$ within $1e-12$, and every w_s equals $N_s / \sum(N_s)$ within $1e-12$.; Multiplicity m is 1 or 2 and equals activated school outcomes.

Failure route: stop_experiment — Report exit inference infeasible.

a03 — Write compact exit result.

Consumes: exit_fits. Produces: exit_primary.

1. Extract target statistic interval and diagnostics.
2. Apply fixed decision regions and save immutable JSON.

Assertions: Output decision recomputes exactly.

Failure route: downgrade_claim — Report no education-exit claim.

Output contract

Output	Path	Grain	Required fields
exit_sample	preregistration/run/exit/sample.parquet	pupil	PNR_hash, centered_score, red_as
exit_fits	preregistration/run/exit/fits.rds	fitted procedure	procedure_id, estimate, standard_e
exit_primary	preregistration/run/exit/primary.json	estimand	tau_exit, standard_error, raw_p, a

Procedure accounting

- **exit_primary_fit**: 1 calls per unit $\times$ 1 fitted units $\times$ 1 repetitions = 1 fits. One primary exit outcome.
- **exit_robustness_fits**: 1 calls per unit $\times$ 6 fitted units $\times$ 1 repetitions = 6 fits. Two clustering choices by three bandwidths.
- Full-data passes: 4. Largest intermediate: Pupil-by-course-spell joined table..

Synthetic dry run. Synthetic course spells test day boundaries completion noncompletion overlap and unknown codes.

Reconciliation. Pupil indicators reconcile to filtered spells and JSON to fit object.

Decision regions.

- **exit_negligible** (null_equivalent): Valid fit and $\text{sim_ci_low} \geq -0.03$ and $\text{sim_ci_high} \leq 0.03$; evaluated first. — The simultaneous interval is contained in the SESOI bounds.
- **exit_change** (supports): Valid fit, negligible condition false, and $\text{adjusted_p} \leq 0.05$; evaluated second. — Evidence supports a nonzero local effect in the estimate sign, without an automatic SESOI claim.
- **exit_inconclusive** (inconclusive): All remaining cases, including $\text{adjusted_p} > 0.05$, an interval crossing a SESOI bound, or implementation failure; evaluated last. — Evidence is inconclusive or execution failed.

Synthesis worlds

world_gate_failure

Trigger. Primary audit fails.

Interpretation. The registered causal question is not answerable with this assignment or data chain.

Allowed claim. Feasibility failure only; no association or school substitute.

world_benefit

Trigger. Conviction benefit region, regardless of secondary pattern.

Interpretation. Red classification locally reduces recorded conviction by at least the SESOI; school outcomes describe concordant or discordant pathways but not mediation.

Allowed claim. Local classification-regime ITT on conviction under RD assumptions.

world_harm

Trigger. Conviction harm region, regardless of secondary pattern.

Interpretation. Red classification locally increases recorded conviction by at least the SESOI; rival stigma or expectation mechanisms become salient but remain unproven.

Allowed claim. Local harmful classification-regime ITT on conviction under RD assumptions.

world_negligible

Trigger. Conviction negligible region, regardless of secondary pattern.

Interpretation. The study excludes conviction effects of plus or minus two percentage points locally.

Allowed claim. Local equivalence within the registered bounds, not universal no effect.

world_uncertain

Trigger. Any remaining valid or failed conviction fit after a passing gate.

Interpretation. Conviction direction or magnitude remains unresolved; secondary results cannot replace it.

Allowed claim. Report estimate and uncertainty or implementation failure without a directional primary conclusion.

Frozen machine-readable preregistration

This appendix is authoritative and contains the complete registered plan.

```
schema_version: '1.1'
artifact: preregistration
registration:
  rq_id: dyslexia_cutoff_justice_contact
  title: Local effects of Denmark's red dyslexia classification on conviction and school diseng
  mode: given_rq
  version: 2
  status: under_review
  generated_at: '2026-09-04T17:00:00Z'
  knowledge_cutoff: '2026-09-04T17:00:00Z'
  outcome_blind: true
  input_digests:
    research_brief: a6cf2af0d463b4079fb791390a8d44e4e5537c12d0bdd7ef4eba0e5435fe2092
    literature_map: fa3f067eb27f81f4a7dbae8d1c432c953b0ed4f274830c3783a05115bf462646
    data_feasibility: ad0eb37dbe964561e46a92729463cf67028ed0cb6174e07e5700d5e9a33f63d4
    design_space: 431746938f02679d986802b4a9608755fef7ac509093fc4292db2a54d04b4271
scope:
  research_question: Among pupils taking Denmark's National Dyslexia Test near its official re
    score cutoff, what is the local intention-to-treat effect of receiving the dyslexic red cl
    on subsequent criminal conviction and school disengagement?
  population: PNR-linkable pupils at their first eligible National Dyslexia Test in a date, ver
    education-level stratum with an authoritative unique red-yellow rule and two-sided score s
  unit: Pupil at first eligible test.
  setting: Denmark's indicated National Dyslexia Test and linked administrative registers.
  time_period: Tests in 2014-2025; conviction from test through the instant before age 21; STI
    over the 24 complete calendar months after the test month; and education exit during post-
    1-730.
  primary_estimand: The retained-pupil-weighted finite-window risk difference in cause-1 cumul
```

of first qualifying conviction before age 21 under red rather than yellow assignment, with and emigration or register end censoring, among first-tested pupils in retained rule strata.

inferential_ceiling: If all gates pass, a local intention-to-treat effect of the red classification bundle among tested marginal pupils; never an effect of dyslexia, testing, one service, me or all pupils.

exclusions:

- Later repeat tests and irreconcilable same-day first-test duplicates.
- Invalid PNRs, undocumented cutoff strata, missing exact test date or score, lack of two-sidedness and pupils already age 21 at test.
- Outcomes on or before the test date and time after death, first verified emigration, age 21 end.

theory:

focal_mechanism: Red classification changes access to a bundle of accommodations, supports, and stigma; these responses may improve engagement and reduce later conviction, although of labeling mechanisms are possible.

rival_mechanisms:

- Stigma or lowered expectations may increase disengagement or conviction risk.
- Selection into testing limits transport and may change composition smoothly or discontinuously the cutoff.
- Score manipulation, coarse mass points, code changes, or differential observability can create discontinuities.

directional_predictions:

- The conviction effect is tested two-sided because prior evidence does not establish its direction.
- Absence and education-exit effects are tested separately and two-sided; neither is treated as evidence.

scope_conditions:

- The contrast is red versus yellow assignment at a pupil-level score cutoff.
- The treatment is the entire classification-and-eligibility regime.
- Conviction means a subsequent qualifying recorded decision, not offending date, charge, arrest, or police contact.

literature_basis:

nearest_work:

- ibsen_2023_dissertation
- nielsen_2021_how_to_cope
- poulsen_juul_elbro_2023

established_knowledge:

- The test combines two alphabetic-code measures, is indicated rather than universal, and uses a cutoff that can open access to support.
- The nearest same-cutoff dissertation uses sharp and fuzzy RD and already studies academic, absence, and educational-trajectory outcomes.
- Observational reading and youth-justice evidence motivates the pathway but does not identify effect.

open_questions:

- Exact version-by-level cutoff rules, score direction, exceptional classifications, support frequency, outcome variance, and effects remain unknown until execution.
- The absence of a same-cutoff conviction study is provisional despite targeted and citation.

contribution: A bounded same-cutoff extension to subsequent recorded conviction, with school and education exit as separate secondary replication or pathway outcomes.

```

data_basis:
  schema_snapshot_ids:
    - fsv_catalog_index
    - fsv_complete_catalog
  population_construction: Reduce UDD_ORDBLINDETEST to each pupil's earliest valid test after a
    a hashed authoritative cutoff table by date and education level; retain only documented stu
    common two-sided support and age-aligned follow-up.
  linkage_plan: Link PNR to KRAF, BEF, DOD, FLYT, STIL absence, KOTRE, UDSP, and date-valid UDI
    is prohibited because it lacks the registered denominator; all codebooks and crosswalks are
    before outcome extraction.
  construct_map:
    - construct_id: red_assignment
      role: treatment
      operational_definition: Indicator that the oriented first-test SCORE is on the documented 1
        of the applicable cutoff; TESTRESULTAT is used only to audit compliance.
      source_fields:
        - UDD_ORDBLINDETEST.SCORE
        - UDD_ORDBLINDETEST.TESTRESULTAT
        - UDD_ORDBLINDETEST.TESTRESULTATNIVEAU
        - UDD_ORDBLINDETEST.UDDANNELSESNIVEAU
        - UDD_ORDBLINDETEST.DATO
      timing: First eligible test date
      alternatives: []
    - construct_id: centered_score
      role: running_variable
      operational_definition: Authoritatively oriented SCORE minus the applicable version-date-1
        cutoff, with red_assignment=1 at centered_score<=0.
      source_fields:
        - UDD_ORDBLINDETEST.SCORE
        - UDD_ORDBLINDETEST.UDDANNELSESNIVEAU
        - UDD_ORDBLINDETEST.DATO
      timing: First eligible test date
      alternatives: []
    - construct_id: conviction_by_21
      role: outcome
      operational_definition: Indicator for at least one tabulation-valid qualifying KRAF convict
        strictly after test and before age 21, death, first verified emigration, or administrati
      source_fields:
        - KRAF.AFG_AFGOEDTO
        - KRAF.AFG_AFGTYP3
        - KRAF.AFG_AFGTYPKO
        - KRAF.AFG_STATUS
        - KRAF.AFG_GER9
      timing: Post-test through day before age 21
      alternatives: []
    - construct_id: stil_absence_rate_24m
      role: outcome
      operational_definition: STIL-only sum(DAGEIALTFRA)/sum(DAGEAKTIV) over exactly 24 complete

```

values beginning with the month after the test month; KMD is prohibited.

source_fields:

- UDD.FOLKESKOLE_FRAVAER_STIL.PNR
- UDD.FOLKESKOLE_FRAVAER_STIL.MAANED
- UDD.FOLKESKOLE_FRAVAER_STIL.DAGEIALTFRA
- UDD.FOLKESKOLE_FRAVAER_STIL.DAGEAKTIV
- UDD.FOLKESKOLE_FRAVAER_STIL.INSTITUTIONSNUMMER
- UDD.FOLKESKOLE_FRAVAER_STIL.SKOLEAAR

timing: Twenty-four complete calendar months beginning with the month after the test month

alternatives: []

- **construct_id:** exit_730d

role: outcome

operational_definition: Indicator for a documented KOTRE discontinuation without completion post-test days 1-730 under the frozen AFG_ART and AUDD map.

source_fields:

- KOTRE.ELEV3_VTIL
- KOTRE.AFG_ART
- KOTRE.AUDD

timing: Post-test days 1-730

alternatives: []

- **construct_id:** observation_end

role: censoring

operational_definition: Minimum of first verified emigration, administrative end, and outcome death is a competing event for conviction and truncates school measurement.

source_fields:

- BEF.REFERENCETID
- BEF.SENESTE_INDVANDRING
- DOD.DODDATO

timing: Test through horizon

alternatives: []

- **construct_id:** baseline_context

role: confounder

operational_definition: Strictly pre-test age, sex, origin, grade, special-needs status, income, and municipality for continuity tests and precision only.

source_fields:

- BEF.FOED_DAG
- BEF.KOEN
- BEF.IE_TYPE
- UDSP.UDD
- UDSP.SPC_ART
- UDDINST.INST2
- UDDINST.BELKOM

timing: Latest valid value on or before test

alternatives: []

unresolved_quantities:

- Gate outcomes, supported strata, bandwidth, assignment compliance, event support, prevalence, censoring, and effects remain unknown until controlled execution.
- Authoritative cutoff, KRAF, absence, exit, and emigration rules must be supplied and hashed

```

    frozen pass/fail algorithms below do not permit analyst discretion.
no_outcome_data_accessed: true
study_dag:
source_design_space_sha256: 431746938f02679d986802b4a9608755fef7ac509093fc4292db2a54d04b4271
estimand_context: Local total effect of red assignment on first-conviction cumulative incidence
    age 21, with death competing and emigration/register end censoring; disengagement is second
    potentially mediating.
nodes:
- node_id: latent_need
  label: Latent reading need
  role: confounder
  observed: false
- node_id: baseline_covariates
  label: Frozen pre-test covariates
  role: confounder
  observed: true
- node_id: testing_selection
  label: First-test selection
  role: selection
  observed: true
- node_id: score
  label: Centered first-test score
  role: instrument
  observed: true
- node_id: cutoff_assignment
  label: Score-implied assignment
  role: instrument
  observed: true
- node_id: red_classification
  label: Red classification regime
  role: treatment
  observed: true
- node_id: support_label_bundle
  label: Support and labeling bundle
  role: mediator
  observed: false
- node_id: disengagement
  label: School disengagement
  role: mediator
  observed: true
- node_id: conviction
  label: First qualifying conviction
  role: outcome
  observed: true
- node_id: death
  label: Death
  role: outcome
  observed: true

```

```

- node_id: emigration
  label: First emigration
  role: selection
  observed: true
- node_id: register_end
  label: Administrative end
  role: selection
  observed: true
- node_id: measurement_regime
  label: Version codebook and coverage
  role: measurement
  observed: true
edges:
- from: latent_need
  to: testing_selection
  relation: causal
  warrant:
    basis: theory
    statement: Need affects referral.
- from: latent_need
  to: score
  relation: causal
  warrant:
    basis: theory
    statement: Reading skill affects score.
- from: latent_need
  to: disengagement
  relation: causal
  warrant:
    basis: prior_evidence
    statement: Reading problems can precede disengagement.
    source_ids:
      - observational_pathway
- from: latent_need
  to: conviction
  relation: causal
  warrant:
    basis: maintained_assumption
    statement: Latent development may affect conviction.
- from: baseline_covariates
  to: testing_selection
  relation: causal
  warrant:
    basis: prior_evidence
    statement: Social context predicts labeling.
    source_ids:
      - selection_boundary
- from: baseline_covariates

```

```

to: conviction
relation: causal
warrant:
  basis: theory
  statement: Prior context affects conviction.
- from: baseline_covariates
  to: disengagement
  relation: causal
  warrant:
    basis: theory
    statement: Prior context affects engagement.
- from: testing_selection
  to: score
  relation: selection
  warrant:
    basis: institution
    statement: Only tested pupils have scores.
    source_ids:
      - test_assignment
- from: score
  to: cutoff_assignment
  relation: causal
  warrant:
    basis: institution
    statement: Verified threshold maps score to assignment.
- from: cutoff_assignment
  to: red_classification
  relation: causal
  warrant:
    basis: institution
    statement: Eligibility changes red status.
    source_ids:
      - test_assignment
- from: red_classification
  to: support_label_bundle
  relation: causal
  warrant:
    basis: prior_evidence
    statement: Classification initiates the bundle.
    source_ids:
      - treatment_bundle
- from: support_label_bundle
  to: disengagement
  relation: causal
  warrant:
    basis: theory
    statement: The bundle may alter engagement.
- from: support_label_bundle

```

```

to: conviction
relation: causal
warrant:
  basis: theory
  statement: The bundle may alter conviction.
- from: disengagement
  to: conviction
  relation: causal
  warrant:
    basis: theory
    statement: Disengagement may mediate later risk.
- from: red_classification
  to: emigration
  relation: causal
  warrant:
    basis: maintained_assumption
    statement: Assignment may affect residence.
- from: red_classification
  to: death
  relation: causal
  warrant:
    basis: maintained_assumption
    statement: Survival effects cannot be excluded ex ante.
- from: death
  to: conviction
  relation: causal
  warrant:
    basis: institution
    statement: Death precludes later conviction.
- from: emigration
  to: conviction
  relation: selection
  warrant:
    basis: institution
    statement: Emigration limits ascertainment.
- from: register_end
  to: conviction
  relation: selection
  warrant:
    basis: institution
    statement: Register end stops ascertainment.
- from: measurement_regime
  to: red_classification
  relation: measurement
  warrant:
    basis: institution
    statement: Version rules determine classification.
- from: measurement_regime

```



```

to: disengagement
relation: measurement
warrant:
  basis: institution
  statement: Coverage determines measurement.
- from: measurement_regime
  to: conviction
  relation: measurement
  warrant:
    basis: institution
    statement: KRAF mappings determine measurement.
open_paths:
- Score gradients through latent need remain; cutoff continuity or finite-window exchangeability,
  covariate closure, identifies the contrast.
- Testing selection limits transport and requires smooth composition locally.
- Emigration may be treatment-affected; conditional independent censoring and positivity are
  while death is competing and never censoring.
forbidden_adjustment:
- support_label_bundle
- disengagement
- death
- emigration
rationale: Identification is from assignment, not a backdoor set. Executable terms are D=score,
  red assignment; centered SCORE and D-by-SCORE; fixed version, level, cutoff, and calendar ;
  and optional frozen pre-test precision variables sex, birth cohort, parental education, par
  prior absence, and institution indicators when source-complete. Measurement eras are gates
  Treatment, measurement nodes, mediators, death, emigration, and future observability are ex
  Johanna's graph supplied mechanisms only; no prior DAG was unioned.
adjustment_sets:
- experiment_id: conviction_rd
  covariates:
    - baseline_covariates
  rationale: The DAG node denotes frozen pre-test precision terms only; none is asserted to c
    backdoor path. Identification is finite-window exchangeability at the personal cutoff.
  remaining_open_paths:
    - Latent-need gradients, testing selection, censoring exchangeability, interference, and m
      validity remain assumptions.
- experiment_id: absence_rd
  covariates:
    - baseline_covariates
  rationale: No graph node is claimed as an identifying adjustment set; baseline covariates a
    terms only; identification is the cutoff contrast, not backdoor adjustment.
  remaining_open_paths:
    - Latent-need gradients, testing selection, interference, and measurement validity remain a
- experiment_id: exit_rd
  covariates:
    - baseline_covariates
  rationale: No graph node is claimed as an identifying adjustment set; baseline covariates a

```

```

    terms only; identification is the cutoff contrast, not backdoor adjustment.
remaining_open_paths:
- Latent-need gradients, testing selection, interference, and measurement validity remain a
question_map:
- question_id: q_assignment
  question_clause: Can first-tested pupils near the official red-yellow cutoff support the reg
    local contrast?
  experiment_id: assignment_audit
  estimand: No outcome estimand; a deterministic Boolean audit of whether the registered local
    and each outcome measurement chain are executable.
  output_id: audit_decision
  claim_ceiling: feasibility_only
- question_id: q_conviction
  question_clause: What is the local intention-to-treat effect of red classification on subsequ
    conviction before age 21?
  experiment_id: conviction_rd
  estimand: The retained-pupil-weighted finite-window risk difference in cause-1 cumulative in
    of first qualifying conviction before age 21 under red rather than yellow assignment, with
    and emigration or register end censoring, among first-tested pupils in retained rule strat
  output_id: conviction_primary
  claim_ceiling: causal
- question_id: q_absence
  question_clause: What is the local intention-to-treat effect of red classification on STIL al
    the 24 complete calendar months after the test month?
  experiment_id: absence_rd
  estimand: The retained-pupil-weighted finite-window difference in STIL total absence days per
    school day over the 24 complete calendar months after the test month under red rather than
    assignment.
  output_id: absence_primary
  claim_ceiling: causal
- question_id: q_exit
  question_clause: What is the local intention-to-treat effect of red classification on educat
    without completion during post-test days 1-730?
  experiment_id: exit_rd
  estimand: The retained-pupil-weighted finite-window risk difference in education exit without
    during post-test days 1-730 under red rather than yellow assignment.
  output_id: exit_primary
  claim_ceiling: causal
execution_governance:
  authority: This YAML, hashed source documentation, and version-locked code are the exclusive
    authority; outcomes cannot resolve design choices.
  execution_order:
  - assignment_audit
  - conviction_rd
  - absence_rd
  - exit_rd
environment:
  language: R 4.5.x

```

```

software:
- R 4.5.x
- riskRegression 2025.x
- prodlim 2025.x
- fixest 0.13.x
- rdlocrand 1.1.x
- arrow 19.x
- data.table 1.17.x
environment_capture: Save renv.lock, sessionInfo(), package source hashes, code commit, and
  hashes before unlocking outcomes.
seed_policy: Use integer seed 20260904 for synthetic data and any randomized tie-breaking;
  records use deterministic sorting only.
time_zone: Europe/Copenhagen
locale: C.UTF-8
data_access_sequence: Build synthetic tests; freeze and hash documentation; run assignment and
  audit without KRAF or post-test school values; then disclose only masked support totals; use
  outcome table only after its gate passes.
global_invariants:
- No row-level outcome, event count by assignment, score-outcome table, or effect is inspected
  the affected gate is immutable.
- PNR is unique in every final analysis table and every included record derives from one earlier
  test.
- Red is always centered_score<=0; yellow is centered_score>0; zero follows the authoritative
  rule.
- No post-treatment mediator, death, emigration, or future status enters the outcome regression
  baseline covariate.
failure_policy: Failed assertions stop the affected experiment and downstream claims; they need
  a proxy outcome, changed horizon, uncontrolled association, or analyst-selected bandwidth.
deviation_log: preregistration/deviations.yaml
experiments:
- experiment_id: assignment_audit
  title: Outcome-blind assignment and measurement gate
  epistemic_role: diagnostic
  specification_status: frozen
  unresolved_choices: []
  purpose: Determine which causal outcome experiments, if any, may execute without inspecting
    outcomes.
  dependencies: []
  activation:
    when: Always first.
    skip_when: Never.
  hypothesis:
    claim: The exact cutoff and measurement chains support at least the conviction RD.
    'null': The conviction chain fails.
    alternative: The conviction chain passes.
    directional: false
  design:
    family: rdd

```

estimand: No outcome estimand; a deterministic Boolean audit of whether the registered localities and each outcome measurement chain are executable.

identifying_variation: Pupil's own first-test SCORE crossing a documented version-date-level cutoff, inspected without outcome values.

counterfactual: Near-cutoff first-tested pupils must have two-sided support and continuous composition and observability.

assignment_mechanism: The authoritative rule maps the pupil's oriented SCORE to red when centered and yellow otherwise.

assumptions:

- Documentation uniquely defines every retained rule
- audit inputs are outcome-free
- and diagnostics challenge but cannot prove continuity.

diagnostics:

- Exact score-label concordance
- two-sided mass-point support
- rddensity manipulation test
- Holm-adjusted predetermined balance tests
- linkage continuity
- and codebook completeness.

downgrade_path: Exclude only prospectively documented invalid strata while support remains non-zero. Retain only separately passing school measures and never replace conviction as a stratum.

domain_fit: Assignment-first RD auditing matches an individual institutional threshold and an observation process.

method_specific:

running_variable: Oriented SCORE minus unique documented cutoff.

cutoff: Zero, with red on the nonpositive side.

assignment_rule: $\text{red_assignment} = 1(\text{centered_score} \leq 0)$.

continuity: Predetermined composition and potential outcomes are continuous at zero within strata.

manipulation_check: For each candidate symmetric lattice window, `rdlocrand::rdrandinf` with `rdlocrand::rdrandinf` and 100000 Fisher draws tests the red-versus-yellow difference in cell counts; Holm in `rdlocrand::rdrandinf` and every frozen balance test. Reject a window when adjusted $p \leq 0.05$.

bandwidth_policy: Enumerate symmetric windows by adding exactly one documented score cell. Require at least two occupied cells per side and full-rank side-specific linear terms. the smallest window passing manipulation, balance, and the 10000-replicate calibration score-width candidates are imposed before the lattice is documented.

local_population: First-tested pupils in documented strata within the first passing h.

operationalization:

sample: All valid first test records in documented strata before outcome linkage.

treatment_or_exposure: Score-implied red assignment and recorded TESTRESULTAT compliance.

outcome: Gate Booleans only.

covariates:

- Age
- sex
- origin
- pre-test grade
- pre-test special-needs status
- institution type

- municipality

time: Test date plus documented future coverage.

exclusions:

- All outcome values and assignment-specific event counts

analysis:

estimator: `rdrobust::rdrobust` and `rddensity::rddensity` for diagnostic discontinuities.

specification: Local linear, triangular kernel, fixed ordered h candidates, stratum fixed effects, and side-specific slopes.

uncertainty: Robust bias-corrected 95% intervals; Holm-adjusted diagnostic p-values.

clustering: First-test institution INSTNR; score-mass-point clustering is reported as a series of diagnostic.

missingness: Missing rule keys fail the record; missing covariates form explicit categories; missing PNR, DATO, or SCORE excludes.

multiplicity_family: `audit_family`

robustness:

- Reconcile implied and recorded classification in every stratum
- report support by unique score mass point
- and repeat balance with score-mass-point clustering.

prospective_assessment:

expected_direction: `unknown`

smallest_effect_of_interest:

status: `not_applicable`

value: `null`

unit: `gate Boolean`

rationale: This experiment audits feasibility and has no outcome effect.

precision_plan: A candidate bandwidth passes support with at least four distinct mass point pupils on each side; justice information additionally requires 80% masked simulation power and 2 percentage-point risk difference at two-sided alpha 0.05.

weak_data_scenario: No candidate bandwidth meets support or masked information requirements for the justice study.

surprising_result: Any score-label discordance, bunching, or covariate discontinuity triggers a prespecified restriction or failure branch, never outcome-model repair.

execution:

identity_chain:

question_clause: Can first-tested pupils near the official red-yellow cutoff support the local contrast?

estimand: No outcome estimand; a deterministic Boolean audit of whether the registered local contrast and each outcome measurement chain are executable.

analysis_variable: `all_gates_pass`

target_statistic: `conviction_gate Boolean` plus `absence_gate` and `exit_gate Boolean`s

primary_output_id: `audit_decision`

sources:

- source_id: `test_source`

resource_id: `fsv_complete_catalog`

tables:

- `UDD_ORDBLINDETEST`

fields:

- `PNR`

- DATO
- SCORE
- TESTRESULTAT
- TESTRESULTATNIVEAU
- UDDANNELSESNIVEAU
- INSTNR
- SKOLEAAR

grain: pupil-test record

keys:

- PNR
- DATO

temporal_semantics: DATO is exact test date and orders repeat tests.

filters:

- DATO in 2014-2025
- valid documented PNR

- source_id: baseline_source

resource_id: fsv_complete_catalog

tables:

- BEF
- UDSP
- UDDINST

fields:

- PNR
- REPERENCETID
- FOED_DAG
- KOEN
- IE_TYPE
- UDD
- SPC_ART
- INSTNR
- INST2
- BELKOM

grain: pupil or institution snapshot

keys:

- PNR
- REPERENCETID
- INSTNR

temporal_semantics: Latest valid snapshot on or before DATO only.

filters:

- No post-test status

- source_id: assignment_authority

resource_id: fsv_complete_catalog

tables:

- authoritative ministry test manual and version-level cutoff annex

fields:

- version_id
- valid_from
- valid_to

```

- education_level
- score_precision
- red_cutoff
- score_direction
- inclusive_side
- result_code
grain: one version-date-level rule
keys:
- version_id
- valid_from
- education_level
temporal_semantics: Rule effective on DATO; select the latest publication issued before
unlock, preferring the issuing Ministry over derivative documentation.
filters:
- Document must be issued by the Danish Ministry or test owner and contain every listed
- source_id: kraf_authority
resource_id: fsv_complete_catalog
tables:
- Statistics Denmark KRAF codebook and annual value labels
fields:
- AFG_STATUS
- AFG_AFGTYP3
- AFG_GER7
- AFG_AFGOEDTO
- appeal_finality
grain: code value by validity interval
keys:
- field
- code
- valid_from
temporal_semantics: Apply the value label effective on AFG_AFGOEDTO; conviction requires
guilty/sanction disposition and excludes charge, acquittal, dismissal, and pending appeal
on the same record.
filters:
- Statistics Denmark source only; a missing or conflicting value mapping fails justice.
- source_id: observation_authority
resource_id: fsv_complete_catalog
tables:
- BEF
- FLYT
- DOD
- KOTRE
- UDD_FOLKESKOLE_FRAVAER_STIL
fields:
- REFERENCETID
- HAEND_DATO
- HENV_KOM
- FRA_KOM

```

- TIL_KOM
- DODDATO
- AFG_ART
- AUDD
- MAANED
- DAGEIALTFRA
- DAGEAKTIV

grain: field/code rule

keys:

- table
- field
- valid_from

temporal_semantics: Latest official Statistics Denmark documentation published before our
table owner documentation outranks catalog prose and conflicts fail the affected gate.

filters:

- No outcome frequencies or values.

joins:

- join_id: join_baseline
- left_source: test_source
- right_source: baseline_source

keys:

- left_field: PNR
- right_field: PNR

cardinality: one_to_many

retained_side: left

unmatched_rule: Retain unmatched with missing-category flags except missing birth date for
eligibility.

validation: After latest-prior reduction there is at most one baseline row per pupil-test

variables:

- variable_id: centered_score_audit
- role: running_variable
- grain: pupil
- source_ids:

 - test_source

- source_fields:

 - SCORE
 - DATO
 - UDDANNELSESNIVEAU

ordered_steps:

- Join the hashed authoritative version-date-level cutoff table.
- Orient SCORE so smaller values are red and subtract cutoff.

temporal_rule: Use first eligible test only.

missing_rule: Exclude missing or nonunique mapping.

output_type: double

validation: red side is nonpositive in every retained stratum.

- variable_id: assignment_gate
- role: statistic
- grain: rule stratum


```

source_ids:
- test_source
- assignment_authority
source_fields:
- SCORE
- TESTRESULTAT
- TESTRESULTATNIVEAU
- DATO
- UDDANNELSESNIVEAU
ordered_steps:
- Map DATO and education level to exactly one authority row.
- Compute score-implied class using documented precision direction cutoff and inclusive ;
  the same test record.
- Pass iff 100% of nonmissing recorded classes equal implied classes and no earliest same
  remains; otherwise exclude the stratum, and fail all assignment if none remain.
temporal_rule: Before outcomes.
missing_rule: Missing or conflicting authority mapping is false.
output_type: Boolean by stratum
validation: Synthetic below above exact-cutoff and conflict rows reproduce expected class
- variable_id: linkage_gate
  role: statistic
  grain: rule stratum and side
  source_ids:
  - test_source
  - baseline_source
  source_fields:
  - PNR
  - REFERENCETID
  ordered_steps:
  - Define eligible denominator as first tests with syntactically valid PNR under authority
    and CPRTJEK predicates.
  - Compute linked_share=count with exactly one pre-test BEF match/eligible denominator by
  - Pass iff every share is at least 0.95 and the absolute red-yellow difference is at most
  temporal_rule: Pre-test linkage only.
  missing_rule: Missing validity code or zero denominator is false.
  output_type: Boolean plus shares
  validation: Boundary 0.95 and 0.02 pass; any lower share or larger gap fails.
- variable_id: measurement_gates
  role: statistic
  grain: outcome and rule stratum
  source_ids:
  - kraf_authority
  - observation_authority
  source_fields:
  - AFG_STATUS
  - AFG_AFGTYP3
  - AFG_GER7
  - AFG_AFGOEDTO

```

- MAANED
- DAGEIALTFRA
- DAGEAKTIV
- AFG_ART
- AUDD

ordered_steps:

- Justice passes only if every effective KRAF code maps uniquely and same-day conviction ties are absent in synthetic and real metadata; any real tie stops justice without inspecting its assignment side.
- Absence passes only if MAANED parses uniquely, all 24 required months fall inside STILL, duplicate pupil-month-institution keys are exact duplicates, concurrent rows are documented and numerator and denominator are nonnegative with numerator no greater than denominator.
- Exit passes only if every AFG_ART and AUDD value has one completion/noncompletion mapping. KOTRE covers all 730 days.

temporal_rule: Rules and coverage are fixed before outcome contrasts.

missing_rule: Unknown code, absent month, zero total active-day denominator, conflict, or additivity is false for that outcome.

output_type: Three Booleans with reason codes

validation: Synthetic pass boundary conflict missing-month zero-denominator and unknown-code emit one expected Boolean and reason.

- **variable_id:** discrete_support_gate

role: statistic

grain: candidate lattice window

source_ids:

- test_source
- baseline_source

source_fields:

- SCORE
- INSTNR
- FOED_DAG
- KOEN
- IE_TYPE

ordered_steps:

- Enumerate unique documented score cells and symmetric candidate windows from smallest to largest.
- Run 100000-draw Fisher difference-in-counts manipulation test and identical tests for age sex and origin; seed 20260904 and tie ordering manipulation age sex origin.
- Holm-adjust all four p-values and retain only windows with every adjusted p greater than two occupied cells per side and full-rank design.

temporal_rule: No outcomes.

missing_rule: Missing lattice or covariate becomes explicit category; missing score fails.

output_type: Boolean and adjusted p-values by window

validation: Exact p=0.05 fails because pass requires greater than 0.05.

- **variable_id:** masked_power_gate

role: statistic

grain: candidate window and outcome

source_ids:

- test_source

source_fields:

- SCORE
- INSTNR

ordered_steps:

- For each retained window generate 10000 null datasets and 10000 SESOI datasets on observed score cells and institution IDs using $Y = b_0 + b_1 * X + b_2 * X^2 + b_3 * X^3 + u_{\text{institution}} + \text{error}$, with standardized total variance 1, ICC grid 0, 0.05, 0.10, 0.20, and Bernoulli outcomes formed by calibration to masked overall prevalence supplied only as one value rounded to 0.01.
- For school continuous rate use Gaussian Y truncated to $[0, 1]$; for binary exit and causal effect use Bernoulli; add the numeric SESOI to red potential risk/rate on the probability scale; clipping forbidden and discard a scenario if any probability leaves $[0.01, 0.99]$.
- Run the exact registered estimator for each replicate; type-I error is rejection share at baseline and power is rejection share at SESOI. Pass iff for every ICC and admissible baseline prevalence: type-I error ≤ 0.06 power ≥ 0.80 and Monte Carlo standard error ≤ 0.005 ; select the smallest window.

temporal_rule: Only masked overall prevalence rounded to 0.01 may enter; no side-specific prevalence statistic.

missing_rule: Absent prevalence token or inadmissible probability scenario fails the output.

output_type: Boolean plus operating-characteristic table

validation: Seed rerun is byte-identical; boundary 0.06 and 0.80 pass; MCSE above 0.005 is fail.

- **variable_id:** all_gates_pass

role: statistic

grain: run

source_ids:

- test_source
- assignment_authority
- kraf_authority
- observation_authority

source_fields:

- SCORE
- TESTRESULTAT
- PNR
- REPERENCETID
- AFG_STATUS
- MAANED
- AFG_ART

ordered_steps:

- conviction_gate=any common stratum passing assignment linkage discrete support KRAF even censoring positivity and masked conviction power.
- absence_gate=conviction-independent conjunction of assignment linkage discrete support and masked absence power.
- exit_gate=conjunction of assignment linkage discrete support KOTRE mapping/coverage and exit power.
- Emit one Boolean and first failing reason in fixed precedence assignment linkage support mapping coverage ordering positivity power.

temporal_rule: Before outcome-effect unlock.

missing_rule: Any indispensable unresolved input is false.

output_type: Boolean vector

validation: Exactly three gates and one reason per false gate.

```

sample_flow:
- step_id: s01
  input_population: All UDD_ORDBLINDETEST records
  operation: Keep valid PNR DATO SCORE and documented candidate rule keys.
  output_population: Valid candidate tests
  exclusion_record: Write reason per excluded record.
- step_id: s02
  input_population: Valid candidate tests
  operation: Sort PNR DATO INSTNR SCORE and retain earliest; identical same-day duplicates
    and conflicting ties exclude.
  output_population: First-test pupils
  exclusion_record: Record repeat or conflicting-duplicate reason.
- step_id: s03
  input_population: First-test pupils
  operation: Apply supported-stratum and ordered-bandwidth gates without outcomes.
  output_population: Audited near-cutoff pupils
  exclusion_record: Record stratum and support failure.
model:
  model_id: audit_rd
  equation_or_algorithm: For each diagnostic Z fit  $Z_i = \alpha + \tau D_i + \beta_{\text{minus}} X_i + \beta_{\text{plus}} X_i$ 
    for  $|X_i| \leq h$ ; gate on Holm-adjusted p-values and deterministic support rules.
  target_statistic: conviction_gate Boolean plus absence_gate and exit_gate Booleans
  symbol_map:
  - symbol: Z_i
    meaning: One predetermined covariate or assignment indicator.
    source_fields:
    - TESTRESULTAT
    - FOED_DAG
    - KOEN
    - IE_TYPE
    - UDD
    - SPC_ART
    construction_variables:
    - all_gates_pass
  - symbol: X_i
    meaning: Centered oriented first-test score.
    source_fields:
    - SCORE
    construction_variables:
    - centered_score_audit
  - symbol: D_i
    meaning: Score-implied red assignment.
    source_fields:
    - SCORE
    construction_variables:
    - centered_score_audit
  estimator_api: rdrobust::rdrobust(y=Z,x=X,c=0,p=1,kernel="triangular",h=h,vce="cluster",
  weights: Triangular kernel  $\max(0, 1 - |X|/h)$ , multiplied by equal retained-stratum weights.

```

```

fixed_effects: Version-date-level stratum indicators.
reference_levels: Yellow D=0 and positive-score side.
uncertainty: Robust bias-corrected 95% intervals and Holm alpha 0.05 across density and
  tests.
clustering: First-test INSTNR.
diagnostics:
- Assignment concordance
- rddensity
- seven predetermined balance fits
- two-sided mass points
- design rank
- linkage continuity.
actions:
- action_id: a01
  goal: Freeze authoritative rules and dry-run fixtures.
  consumes:
  - test_source
  - assignment_authority
  - kraf_authority
  - observation_authority
  procedure:
  - Select documents by the registered issuer/date precedence, record URL or catalog path,
    effective dates, and SHA-256; material conflicts set the affected mapping false.
  - Compile explicit cutoff, KRAF final-conviction, emigration, STIL, and exit lookup rows
    synthetic pass, boundary, conflict, and failure fixtures.
  produces:
  - rule_manifest
  assertions:
  - Every lookup row has one source and validity interval.
  - All synthetic expected Booleans and reasons match exactly.
  on_failure:
    route: mark_infeasible
    detail: Set affected gate false; no analyst reconciliation or substitute source.
- action_id: a02
  goal: Construct first tests and rule strata.
  consumes:
  - test_source
  - rule_manifest
  procedure:
  - Sort by PNR,DATO,INSTNR,SCORE,TESTRESULTAT; collapse byte-identical rows and retain ea
  - Exclude a pupil when earliest same-day rows differ on any assignment field; map remain
    to one rule stratum and centered lattice score.
  produces:
  - audit_sample
  assertions:
  - One row per PNR.
  - Every row has one authority mapping and implied class equals recorded class.
  on_failure:

```

```

    route: stop_experiment
    detail: Fail assignment and stop all downstream work.
- action_id: a03
  goal: Compute linkage, support, manipulation, and balance gates.
  consumes:
    - audit_sample
    - baseline_source
  procedure:
    - Compute linkage shares and exact boundary comparisons; enumerate lattice windows in in
      cell count.
    - For every window run the 100000-draw Fisher tests, Holm algorithm, rank and support ass
  produces:
    - diagnostic_results
  assertions:
    - Every eligible window has four raw and adjusted p-values.
    - No outcome table was read.
  on_failure:
    route: mark_infeasible
    detail: Set discrete-support gate false.
- action_id: a04
  goal: Compute source and event-history measurement gates.
  consumes:
    - rule_manifest
    - observation_authority
    - kraf_authority
  procedure:
    - Apply the exact same-record KRAF predicate and event priority rules to synthetic histor
      verify field/code coverage without tabulating assignment-specific outcomes.
    - Verify STIL 24-month availability/additivity and KOTRE mapping/730-day coverage; comput
      emigration as earliest authoritative outward move after DATO, permanently censoring at
      even after return.
  produces:
    - measurement_results
  assertions:
    - Every source gate has a Boolean and fixed reason.
    - Death is competing, never censoring; emigration and register end are censoring.
  on_failure:
    route: skip_downstream
    detail: Set only the affected outcome gate false.
- action_id: a05
  goal: Calibrate exact estimators using masked simulations.
  consumes:
    - audit_sample
    - diagnostic_results
    - measurement_results
  procedure:
    - Receive only overall prevalence rounded to 0.01 through the firewall and simulate the c
      registered DGP for every retained window, outcome, and ICC with seed 20260904.

```

- Compute type-I error, SESOI power, and MCSE from 10000 replicates per state; choose the window passing every condition.

produces:

- power_results

assertions:

- No side-specific outcome count or effect is present.
- All operating-characteristic cells meet boundary rules for a pass.

on_failure:

- route: skip_downstream
- detail: Set affected power gate false.

- action_id: a06

goal: Emit deterministic activation decision.

consumes:

- diagnostic_results
- measurement_results
- power_results
- rule_manifest

procedure:

- Combine gates using the registered conjunctions and failure-reason precedence.
- Write immutable decision and hash every consumed artifact.

produces:

- audit_decision

assertions:

- Exactly one audit decision is emitted.
- Every false component maps to exclusion, skipped outcome, or primary abandonment.

on_failure:

- route: skip_downstream
- detail: Emit audit_fail and no outcome claim.

outputs:

- output_id: rule_manifest

path: preregistration/run/audit/rule_manifest.json

format: JSON

grain: rule file

fields:

- path
- sha256
- authority
- valid_from
- valid_to

produced_by: a01

consumers:

- a02
- a04
- a06

- output_id: audit_sample

path: preregistration/run/audit/audit_sample.parquet

format: Parquet

grain: pupil

```

fields:
- PNR_hash
- DATO
- centered_score
- red_assignment
- stratum_id
- INSTNR
produced_by: a02
consumers:
- a03
- a05
- output_id: diagnostic_results
path: preregistration/run/audit/diagnostics.parquet
format: Parquet
grain: diagnostic
fields:
- diagnostic_id
- estimate
- standard_error
- p_value
- holm_p
- pass
- reason
produced_by: a03
consumers:
- a05
- a06
- output_id: measurement_results
path: preregistration/run/audit/measurement.json
format: JSON
grain: outcome gate
fields:
- outcome_id
- mapping_pass
- coverage_pass
- ordering_pass
- positivity_pass
- reason
produced_by: a04
consumers:
- a05
- a06
- output_id: power_results
path: preregistration/run/audit/power.parquet
format: Parquet
grain: window-outcome-ICC-state
fields:
- window_id

```


- outcome_id
- icc
- state
- repetitions
- rejection_rate
- mcse
- pass

produced_by: a05

consumers:

- a06

- output_id: audit_decision

path: preregistration/run/audit/decision.json

format: JSON

grain: run

fields:

- conviction_gate
- absence_gate
- exit_gate
- selected_window
- retained_strata
- stratum_n
- reason
- manifest_sha256

produced_by: a06

consumers:

- audit_pass
- audit_partial
- audit_fail

quality_control:

synthetic_dry_run: Run all transformations and branches on generated records containing censored outcomes, ties, repeats, censoring, no events, and forced failures before any real outcome access.

invariant_checks:

- Exactly one first test per PNR.
- Implied assignment equals documented assignment for a sharp gate.
- Selected h belongs to the registered ordered set.
- Gate false prevents outcome-table read.

reconciliation: Counts reconcile from raw tests through exclusions to the audit sample; generate hashes the diagnostic and rule manifests.

run_log: preregistration/run/audit/run_log.jsonl

stop_conditions:

- No authoritative unique cutoff remains.
- No two-sided supported h remains.
- Convictions cannot be defined.
- Linkage or observability is discontinuous.

compute_plan:

fit_operations:

- operation_id: fisher_gate_tests

calls_per_unit: 4

```

    fitted_units: 1
    repetitions: 100000
    total_fits: 400000
    justification: Four Fisher randomization tests per candidate window; the operation reports
        each enumerated window and the run log records window count separately.
- operation_id: masked_null_and_sesoi_simulations
    calls_per_unit: 2
    fitted_units: 4
    repetitions: 10000
    total_fits: 80000
    justification: Null and SESOI states for four ICC values per outcome-window; outcome and
        counts are reported as separate full procedure multipliers in power_results.
    full_data_passes: 5
    largest_intermediate: audit_sample with one row per first-tested pupil.
    feasibility_note: All passes exclude outcome values; the masked power routine returns on
        or fail.
decision_regions:
- decision_id: audit_pass
    condition: conviction_gate=true and absence_gate=true and exit_gate=true
    parameters:
    - name: alpha_gate
        value: 0.05
        unit: two-sided familywise level
        rationale: Fixed diagnostic error-control level.
    - name: power_gate
        value: 0.8
        unit: probability
        rationale: Required masked simulation power.
    interpretation: Activate all three outcome experiments.
    claim_status: descriptive_only
- decision_id: audit_partial
    condition: conviction_gate=true and exactly one or both school gates=false
    parameters:
    - name: min_mass_points
        value: 4
        unit: distinct points per side
        rationale: Minimum support for local linear fitting.
    - name: min_side_n
        value: 20
        unit: pupils per side
        rationale: Prevent rank-unstable fits.
    interpretation: Activate conviction and each passing school experiment; unsupported school
        terminate.
    claim_status: descriptive_only
- decision_id: audit_fail
    condition: conviction_gate=false
    parameters:
    - name: conviction_sesoi

```

```

    value: 0.02
    unit: risk-difference points
    rationale: Frozen smallest justice effect for the information gate.
    interpretation: Reject the primary candidate and do not substitute school outcomes.
    claim_status: feasibility_failure
- experiment_id: conviction_rd
  title: Confirmatory sharp RD for conviction before age 21
  epistemic_role: confirmatory
  specification_status: frozen
  unresolved_choices: []
  purpose: Estimate the primary local classification-regime ITT on subsequent qualifying conviction
  dependencies:
  - assignment_audit
  activation:
    when: audit_pass or audit_partial with conviction_gate=true.
    skip_when: conviction_gate=false.
  hypothesis:
    claim: Red assignment changes conviction risk before age 21.
    'null': tau_conviction=0.
    alternative: tau_conviction!=0.
    directional: false
  design:
    family: rdd
    estimand: The retained-pupil-weighted finite-window risk difference in cause-1 cumulative risk
      of first qualifying conviction before age 21 under red rather than yellow assignment, with
      competing and emigration or register end censoring, among first-tested pupils in retained
      identifying_variation: Individual pupil's first-test score crossing the verified cutoff.
      counterfactual: Conviction under yellow assignment for a pupil infinitesimally on the red side
      by yellow-side pupils at the same cutoff.
    assignment_mechanism: Deterministic red assignment when centered_score<=0.
    assumptions:
      - Potential conviction risk and censoring are continuous at zero
      - no precise manipulation
      - no other discontinuous intervention
      - negligible interference
      - and valid consistent outcome coding.
    diagnostics:
      - Audit diagnostics
      - local fit plots
      - leverage
      - effective observations
      - and continuity of death and censoring.
    downgrade_path: Any post-unlock invariant failure makes the estimate infeasible; no fuzzy,
      alternative-outcome, or association repair is allowed in this revision.
    domain_fit: Local-linear RD estimates the pupil-level threshold ITT; fixed-horizon risk regression
      youth-justice event process.
    method_specific:
      running_variable: Oriented SCORE minus verified cutoff.

```

```

    cutoff: Zero.
    assignment_rule: Red iff centered_score<=0.
    continuity: Potential risks meet at zero absent red assignment.
    manipulation_check: Must pass assignment_audit.
    bandwidth_policy: Use selected_h from the ordered outcome-blind audit with no outcome-dr
    local_population: First-tested pupils in retained strata with absolute centered_score<=s
operationalization:
    sample: Audited near-cutoff first-tested pupils alive and resident at test and younger than
    treatment_or_exposure: Score-implied red assignment.
    outcome: Cause-1 cumulative incidence by the instant before age 21, with death as cause 2 a
        end as censoring.
    covariates:
        - Centered score
        - side interaction
        - stratum fixed effects
        - pre-test age
        - sex
        - origin
        - grade
        - special-needs status
    time: Strictly after test through day before age 21, death, first verified emigration, or a
        end.
    exclusions:
        - Pre-test or same-day decisions
        - nonqualifying KRAF records
        - and time outside observability
analysis:
    estimator: Stratum-specific Aalen-Johansen cause-1 cumulative incidence with IPCW censoring
        and retained-pupil weighted aggregation.
    specification: Time zero is DATO. Cause 1 is first qualifying conviction; cause 2 is death
        emigration and KRAF administrative end censor; event-free age 21 closes follow-up. Strata
        are aggregated with w_s=N_s/sum N_s.
    uncertainty: 9999 pupil bootstrap resamples stratified by stratum and assignment side, ref
        CIF, stratum effects, and aggregation; percentile 95% interval and two-sided bootstrap p
    clustering: Resample first-test institutions when at least 30 institutions exist; otherwise
        gate fails. Within each draw sample institutions with replacement and retain all their p
    missingness: Missing outcome record means no event only during verified observation; missin
        censors and missing outcome codes fail the experiment.
    multiplicity_family: primary_conviction_singleton
    robustness:
        - Institution-clustered and score-mass-point-clustered intervals
        - unadjusted and predetermined-covariate residualized fits
        - h multiplied by 0.75 and 1.25 only when within audited support.
prospective_assessment:
    expected_direction: unknown
    smallest_effect_of_interest:
        status: fixed
        value: 0.02

```

```

    unit: absolute risk-difference points
    rationale: A two-percentage-point local change is the smallest policy-relevant justice effect
precision_plan: Report interval width and whether the 95% interval excludes both zero and one
    of opposite sign at least 0.02; masked simulation required 80% power before activation.
weak_data_scenario: If the interval includes both -0.02 and 0.02, inference is imprecise regardless
    of p-value.
surprising_result: A positive estimate challenges the supportive-regime mechanism and elevates
    or expectation mechanisms without proving them.
execution:
  identity_chain:
    question_clause: What is the local intention-to-treat effect of red classification on subsequent
      criminal conviction before age 21?
    estimand: The retained-pupil-weighted finite-window risk difference in cause-1 cumulative
      of first qualifying conviction before age 21 under red rather than yellow assignment, without
      competing and emigration or register end censoring, among first-tested pupils in retained
      strata.
    analysis_variable: conviction_by_21_var
    target_statistic: tau_conviction risk difference
    primary_output_id: conviction_primary
  sources:
  - source_id: audited_source
    resource_id: fsv_complete_catalog
    tables:
    - UDD_ORDBLINDETEST
    fields:
    - PNR
    - DATO
    - SCORE
    - INSTNR
    - UDDANNELSESNIVEAU
    grain: first-tested pupil
    keys:
    - PNR
    temporal_semantics: Frozen audit sample at first test.
    filters:
    - conviction_gate=true
    - absolute centered score at most selected_h
  - source_id: conviction_source
    resource_id: fsv_complete_catalog
    tables:
    - KRAF
    fields:
    - PNR
    - AFG_AFGOEDTO
    - AFG_AFGTYP3
    - AFG_AFGTYPK0
    - AFG_STATUS
    - AFG_GER9

```

```

grain: pupil-decision
keys:
- PNR
- AFG_AFGOEDTO
temporal_semantics: AFG_AFGOEDTO is recorded decision date.
filters:
- Frozen valid status conviction and offence code sets
- source_id: censor_source
resource_id: fsv_complete_catalog
tables:
- BEF
- DOD
fields:
- PNR
- REPERENCETID
- SENESTE_INDVANDRING
- FOED_DAG
- DODDATO
grain: pupil snapshot or death
keys:
- PNR
temporal_semantics: Residence snapshots bracket follow-up; DODDATO is exact death date.
filters:
- Records needed from test through age 21
joins:
- join_id: join_conviction
left_source: audited_source
right_source: conviction_source
keys:
- left_field: PNR
  right_field: PNR
cardinality: one_to_many
retained_side: left
unmatched_rule: Unmatched is event-free only through verified observation.
validation: All retained decisions map to exactly one pupil.
- join_id: join_censor
left_source: audited_source
right_source: censor_source
keys:
- left_field: PNR
  right_field: PNR
cardinality: one_to_many
retained_side: left
unmatched_rule: Missing birth date or observability excludes and records reason.
validation: One deterministic follow-up end per pupil after reduction.
variables:
- variable_id: running_conviction
role: running_variable

```

```

grain: pupil
source_ids:
- audited_source
source_fields:
- SCORE
- DATO
- UDDANNELSESNIVEAU
ordered_steps:
- Read centered_score and selected_h from immutable audit.
- Verify absolute score does not exceed selected_h.
temporal_rule: First eligible test.
missing_rule: Exclude and fail reconciliation.
output_type: double
validation: Both sides and zero rule match audit.
- variable_id: conviction_by_21_var
  role: outcome
  grain: pupil
  source_ids:
  - audited_source
  - conviction_source
  - censor_source
  source_fields:
  - DATO
  - AFG_AFGOEDTO
  - AFG_AFGTYP3
  - AFG_AFGTYPK0
  - AFG_STATUS
  - AFG_GER9
  - FOED_DAG
  - DODDATO
  - REFERENCETID
  ordered_steps:
  - Compute age-21 date and observation end.
  - Filter KRAF rows by frozen status decision offence map on the same record.
  - Retain decisions after DATO and before minimum age-21 observation end and set indicator
    zero only with verified observation.
  temporal_rule: Strictly post-test through day before age 21.
  missing_rule: Unknown observability is censoring and prevents binary risk definition; un-
    fail.
  output_type: integer 0/1
  validation: No event occurs after follow-up end.
sample_flow:
- step_id: s01
  input_population: Audited conviction-eligible pupils
  operation: Require age below 21 and verified baseline residence and birth date.
  output_population: Eligible justice cohort
  exclusion_record: Store reason counts.
- step_id: s02

```

input_population: Eligible justice cohort
 operation: Join qualifying KRAF decisions and observation endpoints then collapse to one
 output_population: Conviction analysis sample
 exclusion_record: Store censoring and semantic failure counts.

model:

model_id: conviction_local_linear
 equation_or_algorithm: For each stratum s , estimate censoring survival $G_i(t)$ from pooled
 cloglog censoring model with D , score-cell, stratum, sex, birth cohort, and origin. Con
 Aalen-Johansen cause-1 CIF $F1_s^d(\text{age}21)$ standardized under $d=1$ and $d=0$ over all retain
 in s . $\tau_s = F1_s^1 - F1_s^0$; N_s is retained audit pupils in s ; $w_s = N_s / \sum_r N_r$; τ_c
 $w_s * \tau_s$.
 target_statistic: tau_conviction risk difference
 symbol_map:

- symbol: Y_i
 meaning: Conviction-by-21 indicator.
 source_fields:
 - AFG_AFGOEDTO
 - AFG_AFGTYP3
 - AFG_STATUS
 - AFG_GER9
 construction_variables:
 - conviction_by_21_var
- symbol: X_i
 meaning: Centered oriented score.
 source_fields:
 - SCORE
 construction_variables:
 - running_conviction
- symbol: D_i
 meaning: Red assignment indicator one for $X_i \leq 0$.
 source_fields:
 - SCORE
 construction_variables:
 - running_conviction

estimator_api: riskRegression::ate(event=prodlim::Hist(time_days,status), treatment="red",
 data=conviction_sample, times=horizon_days, cause=1, estimator="Aalen-Johansen", censor
 formula.censoring=~red_assignment+score_cell+stratum_id+sex+birth_cohort+origin_group)
 stratum-standardized contrasts; $w_s = \text{table(stratum_id)} / \text{nrow(conviction_sample)}$; $\tau = \sum$
 repeat complete pipeline in 9999 institution bootstrap draws stratified by stratum and
 weights: IPCW $1/G_i(t-)$ inside each stratum, never truncated; aggregation $w_s = N_s / \sum N_s$;
 audit pupils. Stop if any $G < 0.10$ or effective $N = (\sum w)^2 / \sum (w^2) < 0.25$ times uncensored
 fixed_effects: Rule-stratum indicators, score-cell indicators, red assignment, sex, birth
 and origin only in the censoring model; no post-assignment variable and no undefined ma
 reference_levels: Yellow $D=0$; lowest centered score cell; earliest rule stratum; register
 code order for sex and origin; earliest birth cohort.
 uncertainty: 9999 institution bootstrap draws; percentile 2.5% and 97.5% quantiles. Fail
 rate must be ≤ 0.01 ; otherwise no estimate.
 clustering: INSTNR primary; unique centered-score mass point robustness.


```

diagnostics:
- Effective N by side
- leverage
- design rank
- fitted values
- cluster count
- censoring continuity.
actions:
- action_id: a01
  goal: Construct frozen conviction outcome and follow-up.
  consumes:
  - audited_source
  - conviction_source
  - censor_source
  procedure:
  - Join KRAF, DOD, and residence histories to every audited pupil without restricting on :
  - Apply final-conviction predicate on the same KRAF record; set status 1 when conviction
    earliest, status 2 when death is strictly earliest, and status 0 at first emigration, 1
    end, or event-free age 21; an age-21 event is excluded and any same-day cross-process t
    justice.
  produces:
  - conviction_sample
  assertions:
  - One row per pupil and binary outcome has verified observation.
  on_failure:
    route: mark_infeasible
    detail: Stop conviction experiment and report no causal estimate.
- action_id: a02
  goal: Fit the primary and registered robustness models.
  consumes:
  - conviction_sample
  procedure:
  - Fit the declared censoring and Aalen-Johansen pipeline separately by rule stratum, cal
    and w_s, and aggregate tau_conviction exactly.
  - Generate 9999 institution bootstrap draws stratified by stratum and side, refit the co
    and compute percentile interval and two-sided p.
  produces:
  - conviction_fits
  assertions:
  -  $\sum(w_s)=1$  within  $1e-12$  and each  $w_s=N_s/\sum(N_s)$  within  $1e-12$ .
  - Every  $G \geq 0.10$ , effective N threshold passes, at least 30 institutions exist, and failed
    share  $\leq 0.01$ .
  on_failure:
    route: stop_experiment
    detail: Mark primary inference infeasible without estimator substitution.
- action_id: a03
  goal: Emit compact primary results and decision fields.
  consumes:

```

```

- conviction_fits
procedure:
- Extract tau standard error confidence bounds p-value effective N bandwidth and diagnosis
- Classify the result using fixed zero and 0.02 boundaries and write immutable output.
produces:
- conviction_primary
assertions:
- Decision classification recomputes exactly from output fields.
on_failure:
  route: downgrade_claim
  detail: Report implementation failure and no outcome claim.
outputs:
- output_id: conviction_sample
  path: preregistration/run/conviction/sample.parquet
  format: Parquet
  grain: pupil
  fields:
    - PNR_hash
    - centered_score
    - red_assignment
    - conviction_by_21
    - stratum_id
    - INSTNR
    - weight
  produced_by: a01
  consumers:
    - a02
- output_id: conviction_fits
  path: preregistration/run/conviction/fits.rds
  format: RDS
  grain: fitted procedure
  fields:
    - procedure_id
    - tau_conviction
    - ci_low
    - ci_high
    - p_value
    - stratum_cif_red
    - stratum_cif_yellow
    - stratum_effects
    - stratum_n
    - stratum_weights
    - failed_bootstrap_share
  produced_by: a02
  consumers:
    - a03
- output_id: conviction_primary
  path: preregistration/run/conviction/primary.json

```

```

format: JSON
grain: estimand
fields:
- tau_conviction
- ci_low
- ci_high
- p_value
- selected_window
- stratum_n
- stratum_weights
- decision_id
produced_by: a03
consumers:
- conviction_benefit
- conviction_harm
- conviction_negligible
- conviction_imprecise
quality_control:
  synthetic_dry_run: Synthetic pupils exercise cutoff ties, same-day outcomes, death, emigr
    age 21, and every decision region.
  invariant_checks:
  - One pupil one outcome.
  - Red side definition matches audit.
  - No decision on or before test counts.
  - No time after observation end is coded event-free.
reconciliation: Sample counts and event indicators reconcile to filtered KRAF rows and a
  primary JSON reconciles to saved fit object.
run_log: preregistration/run/conviction/run_log.jsonl
stop_conditions:
- Gate hash mismatch.
- Unknown KRAF code.
- Rank failure.
- Nonfinite estimate or interval.
compute_plan:
  fit_operations:
  - operation_id: conviction_full_pipeline
    calls_per_unit: 1
    fitted_units: 1
    repetitions: 10000
    total_fits: 10000
    justification: One observed-data pipeline plus 9999 complete bootstrap pipeline refits
      returns every stratum estimate and the frozen weighted aggregate.
  full_data_passes: 4
  largest_intermediate: Pupil-by-KRAF-decision joined table before collapse.
  feasibility_note: Seven fits and four full-data passes are frozen; no resampling repetit.
decision_regions:
- decision_id: conviction_benefit
  condition: ci_high<0 and tau_conviction<=-0.02

```

```

parameters:
- name: sesoi_conviction
  value: 0.02
  unit: risk-difference points
  rationale: Fixed policy-relevant boundary.
- name: alpha_conviction
  value: 0.05
  unit: two-sided level
  rationale: Singleton primary family.
interpretation: Evidence supports a beneficial local effect at least as large as the SESOI.
claim_status: supports
- decision_id: conviction_harm
  condition: ci_low>0 and tau_conviction>=0.02
  parameters:
    - name: sesoi_conviction
      value: 0.02
      unit: risk-difference points
      rationale: Fixed policy-relevant boundary.
    interpretation: Evidence supports a harmful local effect at least as large as the SESOI.
    claim_status: challenges
- decision_id: conviction_negligible
  condition: ci_low>-0.02 and ci_high<0.02
  parameters:
    - name: sesoi_conviction
      value: 0.02
      unit: risk-difference points
      rationale: Equivalence bounds.
    interpretation: Effects of policy-relevant magnitude in either direction are excluded.
    claim_status: null_equivalent
- decision_id: conviction_imprecise
  condition: All remaining valid-fit cases; implementation failure instead terminates at no_
  parameters:
    - name: sesoi_conviction
      value: 0.02
      unit: risk-difference points
      rationale: Defines consequential uncertainty.
    interpretation: Direction or magnitude remains inconclusive.
    claim_status: inconclusive
- experiment_id: absence_rd
  title: Confirmatory finite-window contrast for 24-complete-month STILL absence rate
  epistemic_role: confirmatory
  specification_status: frozen
  unresolved_choices: []
  purpose: Estimate the separate secondary local ITT on school absence.
  dependencies:
    - assignment_audit
  activation:
    when: audit_pass or audit_partial with absence_gate=true.

```

```

    skip_when: absence_gate=false.
hypothesis:
  claim: Red assignment changes absence days per active day.
  'null': tau_absence=0.
  alternative: tau_absence!=0.
  directional: false
design:
  family: rdd
  estimand: The retained-pupil-weighted finite-window difference in STIL total absence days per
    school day over the 24 complete calendar months after the test month under red rather than
    assignment.
  identifying_variation: Individual first-test score crossing the verified cutoff.
  counterfactual: Absence rate under yellow assignment for a marginal red-side tested pupil.
  assignment_mechanism: Deterministic red assignment at centered_score<=0.
  assumptions:
    - Potential absence rates and coverage are continuous at zero
    - no manipulation
    - consistent denominator
    - and negligible interference.
  diagnostics:
    - All audit checks
    - denominator positivity
    - coverage continuity
    - fit leverage and rank.
  downgrade_path: Failed absence measurement or model invariant terminates this outcome only
  domain_fit: Local-linear RD with a continuous rate matches the separate school pathway estimates.
  method_specific:
    running_variable: Oriented SCORE minus verified cutoff.
    cutoff: Zero.
    assignment_rule: Red iff centered_score<=0.
    continuity: Potential absence rate meets at zero absent assignment.
    manipulation_check: Must pass assignment_audit.
    bandwidth_policy: Use selected_h unchanged.
    local_population: Audited first-tested pupils with all 24 registered complete STIL months and a
      positive active-day denominator.
operationalization:
  sample: All audited pupils in passing strata with exactly 24 covered STIL months and a positive
    active-day denominator under the pre-outcome measurement gate.
  treatment_or_exposure: Score-implied red assignment.
  outcome: STIL total absence days divided by active days over exactly 24 complete calendar months
    after the test month.
  covariates:
    - Centered score
    - side interaction
    - stratum fixed effects
    - frozen pre-test covariates
  time: Twenty-four complete calendar months beginning with the calendar month after the test month.
  exclusions:

```

- Noncoverage and nonpositive denominators; never code them zero

analysis:

- estimator: rdrobust::rdrobust local-linear sharp RD.
- specification: Continuous absence rate with triangular weights and side-specific slopes at
- uncertainty: Robust bias-corrected two-sided 95% interval.
- clustering: INSTNR primary; score mass point robustness.
- missingness: Missing numerator or denominator is noncoverage and excludes with reason.
- multiplicity_family: disengagement_family
- robustness:
 - Unadjusted fit
 - score-mass-point clustering
 - 0.75h and 1.25h when supported.

prospective_assessment:

- expected_direction: unknown
- smallest_effect_of_interest:
 - status: fixed
 - value: 0.02
 - unit: absence days per active day
 - rationale: Two percentage points of active school days is the smallest substantively rel
 - shift.
- precision_plan: Report whether the Holm-adjusted 95% simultaneous interval excludes zero o
- plus or minus 0.02.
- weak_data_scenario: An interval spanning both SESOI bounds is inconclusive.
- surprising_result: Increased absence challenges a purely supportive mechanism but does not
- stigma mediation.

execution:

- identity_chain:
 - question_clause: What is the local intention-to-treat effect of red classification on ST
 - over the 24 complete calendar months after the test month?
 - estimand: The retained-pupil-weighted finite-window difference in STIL total absence days
 - school day over the 24 complete calendar months after the test month under red rather t
 - assignment.
 - analysis_variable: absence_rate_var
 - target_statistic: tau_absence rate difference
 - primary_output_id: absence_primary

sources:

- source_id: absence_audit_source
- resource_id: fsv_complete_catalog
- tables:
 - UDD_ORDBLINDETEST
- fields:
 - PNR
 - DATO
 - SCORE
 - INSTNR
 - UDDANNELSESNIveau
- grain: first-tested pupil
- keys:

```

- PNR
temporal_semantics: Immutable audited first-test row.
filters:
- absence_gate=true
- absolute centered score at most selected_h
- source_id: absence_source
resource_id: fsv_complete_catalog
tables:
- UDD_FOLKESKOLE_FRAVAER_STIL
fields:
- PNR
- MAANED
- DAGEIALTFRA
- DAGEAKTIV
- INSTITUTIONSNUMMER
- SKOLEAAR
grain: pupil-month-institution
keys:
- PNR
- MAANED
- INSTITUTIONSNUMMER
temporal_semantics: MAANED is parsed as year-month; include months +1 through +24 relative
test month.
filters:
- Exactly 24 complete months
- KMD prohibited
joins:
- join_id: join_absence
left_source: absence_audit_source
right_source: absence_source
keys:
- left_field: PNR
  right_field: PNR
cardinality: one_to_many
retained_side: left
unmatched_rule: Unmatched is missing coverage and never zero absence.
validation: Each absence record belongs to one index pupil and one post-test period.
variables:
- variable_id: running_absence
role: running_variable
grain: pupil
source_ids:
- absence_audit_source
source_fields:
- SCORE
ordered_steps:
- Read immutable centered score.
- Verify selected bandwidth membership.

```

```

temporal_rule: First test.
missing_rule: Exclude and fail reconciliation.
output_type: double
validation: Matches audit.
- variable_id: absence_rate_var
  role: outcome
  grain: pupil
  source_ids:
    - absence_audit_source
    - absence_source
  source_fields:
    - DATO
    - MAANED
    - DAGEIALTFRA
    - DAGEAKTIV
    - INSTITUTIONSNUMMER
  ordered_steps:
    - Parse MAANED and retain exactly months 1 through 24 after the test month.
    - Collapse exact duplicate pupil-month-institution rows; any nonidentical duplicate fail.
    - Sum documented-additive DAGEIALTFRA and DAGEAKTIV across institutions and months.
    - Set ratio=sum(DAGEIALTFRA)/sum(DAGEAKTIV) only when all 24 months are present and denominator
      otherwise fail the pupil and, because this is post-assignment selection, fail the entire
      gate rather than complete-case restrict.
  temporal_rule: Twenty-four complete post-test calendar months; test month excluded.
  missing_rule: Missing month, nonadditive overlap, missing value, or zero denominator fail
    for the study.
  output_type: double in [0,1]
  validation: Ratio is finite in [0,1], exactly 24 month keys, and synthetic mid-month test
    on next month.
sample_flow:
- step_id: s01
  input_population: Audited absence-eligible pupils
  operation: Attach STIL only and restrict to the 24 complete calendar months beginning after
    test month.
  output_population: Covered school records
  exclusion_record: Record source and noncoverage reason.
- step_id: s02
  input_population: Covered school records
  operation: Aggregate numerator and denominator to pupil and retain positive denominator.
  output_population: Absence analysis sample
  exclusion_record: Record denominator failures.
model:
  model_id: absence_local_linear
  equation_or_algorithm: Within every retained stratum s fit  $Y_i = \alpha_s + \tau_s D_i + \beta_s X_i$ 
    in the audited finite window. Define  $N_s$  as audit_sample pupils in s and  $w_s = N_s / \sum_r$ 
     $\tau_{\text{absence}} = \sum_s w_s \tau_s$ . A single saturated fixed fit returns all  $\tau_s$ ; aggregate
    explicit w vector.
  target_statistic: tau_absence rate difference

```



```

symbol_map:
- symbol: A_i
  meaning: Total absence days per active day.
  source_fields:
    - MAANED
    - DAGEIALTFRA
    - DAGEAKTIV
  construction_variables:
    - absence_rate_var
- symbol: X_i
  meaning: Centered oriented score.
  source_fields:
    - SCORE
  construction_variables:
    - running_absence
- symbol: D_i
  meaning: Red assignment indicator.
  source_fields:
    - SCORE
  construction_variables:
    - running_absence
estimator_api: fit=fixest::feols(absence_rate_var ~ 0 + i(stratum_id,red_assignment,ref=0)
  + i(stratum_id,I(red_assignment*centered_score)), data=absence_rd_sample, weights=~1, clust=
  tau_s=coef red terms; w_s=table(stratum_id)/nrow(data); tau_absence=sum(w_s*tau_s); cov=
  se=sqrt(t(w)%*%V_tau%*%w)
weights: Observation weights are 1. Aggregation weights are exactly  $w_s = N_s / \sum_r N_r$  from the
  audited analysis sample; no cutoff-density or equal-stratum weighting.
fixed_effects: Fully interacted rule-stratum intercepts and stratum-specific centered-score
  on each side; no baseline covariate matrix.
reference_levels: Yellow red_assignment=0 within every rule stratum; centered_score=0.
uncertainty: Marginal cluster-robust covariance by first-test institution. For the school
  with m activated outcomes, Bonferroni simultaneous interval is estimate +/-  $qnorm(1-0.05/m)$ 
  and adjusted_p=min(1,m*2*pnorm(-abs(estimate/SE))).
clustering: INSTNR primary; score mass point robustness.
diagnostics:
- Denominator distribution without assignment labels
- design rank
- leverage
- effective N
- coverage continuity.
actions:
- action_id: a01
  goal: Construct the 24-complete-month STIL absence rate.
  consumes:
    - absence_audit_source
    - absence_source
  procedure:
    - Verify gate and source hash then apply one frozen source-specific algorithm.

```

- Aggregate in-window absence and active days and form the rate only for positive denominator.

produces:

- absence_sample

assertions:

- One row per pupil and rate lies in zero to one.

on_failure:

- route: mark_infeasible
- detail: Terminate absence experiment without substituting exit.

- action_id: a02

goal: Fit registered absence models.

consumes:

- absence_sample

procedure:

- Fit the saturated stratum-specific finite-window model with exactly unit observation within INSTNR cluster covariance.
- Compute N_s , w_s , weighted point estimate, covariance contrast, raw p, Bonferroni adjusted simultaneous interval with m equal to the number of activated school outcomes.

produces:

- absence_fits

assertions:

- All stratum coefficients are finite, $\sum(w_s)=1$ within $1e-12$, and every w_s equals N_s within $1e-12$.
- Multiplicity m is 1 or 2 and equals activated school outcomes.

on_failure:

- route: stop_experiment
- detail: Report absence inference infeasible.

- action_id: a03

goal: Write compact absence result.

consumes:

- absence_fits

procedure:

- Extract target statistic interval and diagnostics.
- Apply fixed decision regions and save immutable JSON.

produces:

- absence_primary

assertions:

- Output decision recomputes exactly.

on_failure:

- route: downgrade_claim
- detail: Report no school-absence claim.

outputs:

- output_id: absence_sample

path: preregistration/run/absence/sample.parquet

format: Parquet

grain: pupil

fields:

- PNR_hash
- centered_score

```

- red_assignment
- absence_rate
- active_days
- stratum_id
- INSTNR
produced_by: a01
consumers:
- a02
- output_id: absence_fits
  path: preregistration/run/absence/fits.rds
  format: RDS
  grain: fitted procedure
  fields:
    - procedure_id
    - estimate
    - standard_error
    - raw_p
    - adjusted_p
    - sim_ci_low
    - sim_ci_high
    - stratum_estimates
    - stratum_n
    - stratum_weights
  produced_by: a02
  consumers:
    - a03
- output_id: absence_primary
  path: preregistration/run/absence/primary.json
  format: JSON
  grain: estimand
  fields:
    - tau_absence
    - standard_error
    - raw_p
    - adjusted_p
    - sim_ci_low
    - sim_ci_high
    - selected_window
    - stratum_n
    - stratum_weights
    - decision_id
  produced_by: a03
  consumers:
    - absence_change
    - absence_negligible
    - absence_inconclusive
quality_control:
  synthetic_dry_run: Synthetic monthly and dated records test boundary days noncoverage zero

```

```

    and both source algorithms.
invariant_checks:
- One source algorithm per pupil.
- Numerator never exceeds denominator.
- No noncoverage coded zero.
- Centered score matches audit.
reconciliation: Pupil totals reconcile to retained source records and JSON to fit object
run_log: preregistration/run/absence/run_log.jsonl
stop_conditions:
- Gate mismatch.
- Both or neither source selected.
- Invalid denominator.
- Nonfinite fit.
compute_plan:
fit_operations:
- operation_id: absence_primary_fit
  calls_per_unit: 1
  fitted_units: 1
  repetitions: 1
  total_fits: 1
  justification: One primary absence outcome.
- operation_id: absence_robustness_fits
  calls_per_unit: 1
  fitted_units: 6
  repetitions: 1
  total_fits: 6
  justification: Two clustering choices by three bandwidths.
full_data_passes: 4
largest_intermediate: Pupil-by-school-period absence table.
feasibility_note: Seven fits and four passes; family correction is deterministic from ac
    members.
decision_regions:
- decision_id: absence_negligible
  condition: Valid fit and  $\text{sim\_ci\_low} \geq -0.02$  and  $\text{sim\_ci\_high} \leq 0.02$ ; evaluated first.
  parameters:
  - name: sesoi_absence
    value: 0.02
    unit: outcome-scale difference
    rationale: Frozen equivalence boundary.
  - name: family_alpha
    value: 0.05
    unit: familywise probability
    rationale: Bonferroni school-family level.
  interpretation: The simultaneous interval is contained in the SESOI bounds.
  claim_status: null_equivalent
- decision_id: absence_change
  condition: Valid fit, negligible condition false, and  $\text{adjusted\_p} \leq 0.05$ ; evaluated second.
  parameters:

```

- name: family_alpha
 - value: 0.05
 - unit: familywise probability
 - rationale: Bonferroni school-family level.
- name: sesoi_absence
 - value: 0.02
 - unit: outcome-scale difference
 - rationale: Used by the preceding region.

interpretation: Evidence supports a nonzero local effect in the estimate sign, without an SESOI claim.

claim_status: supports

- decision_id: absence_inconclusive
 - condition: All remaining cases, including adjusted_p>0.05, an interval crossing a SESOI bound, implementation failure; evaluated last.

parameters:

- name: family_alpha
 - value: 0.05
 - unit: familywise probability
 - rationale: Completes the partition.
- name: sesoi_absence
 - value: 0.02
 - unit: outcome-scale difference
 - rationale: Completes the partition.

interpretation: Evidence is inconclusive or execution failed.

claim_status: inconclusive

- experiment_id: exit_rd
 - title: Confirmatory sharp RD for 730-day education exit
 - epistemic_role: confirmatory
 - specification_status: frozen
 - unresolved_choices: []
 - purpose: Estimate the separate secondary local ITT on education exit without completion.

dependencies:

- assignment_audit

activation:

- when: audit_pass or audit_partial with exit_gate=true.
- skip_when: exit_gate=false.

hypothesis:

- claim: Red assignment changes education-exit risk.
- 'null': tau_exit=0.
- alternative: tau_exit!=0.
- directional: false

design:

- family: rdd
- estimand: The retained-pupil-weighted finite-window risk difference in education exit with during post-test days 1-730 under red rather than yellow assignment.
- identifying_variation: Individual first-test score crossing the verified cutoff.
- counterfactual: Exit risk under yellow assignment for a marginal red-side tested pupil.
- assignment_mechanism: Deterministic red assignment at centered_score<=0.

```

assumptions:
- Potential exit risk and KOTRE coverage are continuous at zero
- no manipulation
- valid completion map
- negligible interference.
diagnostics:
- Audit checks
- coverage continuity
- rank
- leverage
- effective N.
downgrade_path: Failed exit measurement or model invariant terminates this outcome only.
domain_fit: Binary-risk local-linear RD matches the separate education-exit estimand.
method_specific:
  running_variable: Oriented SCORE minus verified cutoff.
  cutoff: Zero.
  assignment_rule: Red iff centered_score<=0.
  continuity: Potential exit risk meets at zero absent assignment.
  manipulation_check: Must pass assignment_audit.
  bandwidth_policy: Use selected_h unchanged.
  local_population: Audited first-tested pupils with KOTRE observability in days 1-730.
operationalization:
  sample: Audited pupils with valid KOTRE coverage and exit coding.
  treatment_or_exposure: Score-implied red assignment.
  outcome: Exit without completion in post-test days 1-730.
  covariates:
  - Centered score
  - side interaction
  - stratum fixed effects
  - frozen pre-test covariates
  time: Post-test days 1-730 truncated at death emigration or source end.
  exclusions:
  - Unknown KOTRE coverage or exit code
analysis:
  estimator: rdrobust::rdrobust local-linear sharp RD.
  specification: Binary exit risk with triangular weights and side-specific slopes at select
  uncertainty: Holm-adjusted simultaneous two-sided 95% interval.
  clustering: INSTNR primary; score mass point robustness.
  missingness: Missing coverage is excluded and never no exit.
  multiplicity_family: disengagement_family
  robustness:
  - Unadjusted fit
  - score-mass-point clustering
  - 0.75h and 1.25h when supported.
prospective_assessment:
  expected_direction: unknown
  smallest_effect_of_interest:
    status: fixed

```

```

    value: 0.03
    unit: absolute risk-difference points
    rationale: Three percentage points is the smallest policy-relevant two-year exit-risk change.
precision_plan: Report whether the Holm-adjusted simultaneous interval excludes zero or lies within
    plus or minus 0.03.
weak_data_scenario: An interval spanning both SESOI bounds is inconclusive.
surprising_result: Increased exit challenges a purely supportive mechanism without proving otherwise.
execution:
identity_chain:
    question_clause: What is the local intention-to-treat effect of red classification on education exit
        exit without completion during post-test days 1-730?
    estimand: The retained-pupil-weighted finite-window risk difference in education exit without completion
        during post-test days 1-730 under red rather than yellow assignment.
    analysis_variable: exit_730_var
    target_statistic: tau_exit risk difference
    primary_output_id: exit_primary
sources:
- source_id: exit_audit_source
  resource_id: fsv_complete_catalog
  tables:
  - UDD_ORDBLINDETEST
  fields:
  - PNR
  - DATO
  - SCORE
  - INSTNR
  - UDDANNELSESNIVEAU
  grain: first-tested pupil
  keys:
  - PNR
  temporal_semantics: Immutable audited first-test row.
  filters:
  - exit_gate=true
  - absolute centered score at most selected_half
- source_id: exit_source
  resource_id: fsv_complete_catalog
  tables:
  - KOTRE
  fields:
  - PNR
  - ELEV3_VFRA
  - ELEV3_VTIL
  - AFG_ART
  - AUDD
  - UDD
  - INSTNR
  grain: pupil-course spell
  keys:

```

```

- PNR
- ELEV3_VFRA
temporal_semantics: ELEV3_VTIL is spell end and AFG_ART plus AUDD define completion status
filters:
- Spell ends in post-test days 1-730
joins:
- join_id: join_exit
  left_source: exit_audit_source
  right_source: exit_source
  keys:
  - left_field: PNR
    right_field: PNR
  cardinality: one_to_many
  retained_side: left
  unmatched_rule: Unmatched is no exit only when KOTRE population coverage is verified.
  validation: Each spell maps to one index pupil.
variables:
- variable_id: running_exit
  role: running_variable
  grain: pupil
  source_ids:
  - exit_audit_source
  source_fields:
  - SCORE
  ordered_steps:
  - Read immutable centered score.
  - Verify selected bandwidth membership.
  temporal_rule: First test.
  missing_rule: Exclude and fail reconciliation.
  output_type: double
  validation: Matches audit.
- variable_id: exit_730_var
  role: outcome
  grain: pupil
  source_ids:
  - exit_audit_source
  - exit_source
  source_fields:
  - DATO
  - ELEV3_VTIL
  - AFG_ART
  - AUDD
  ordered_steps:
  - Filter spell ends to days 1-730 on the same record.
  - Apply frozen AFG_ART and AUDD completion map.
  - Set one if any qualifying noncompletion exit and otherwise zero only under verified coverage
  temporal_rule: Days 1-730 after test.
  missing_rule: Unknown code or coverage fails the experiment.

```



```

output_type: integer 0/1
validation: Every one has a qualifying source spell.
sample_flow:
- step_id: s01
  input_population: Audited exit-eligible pupils
  operation: Join KOTRE spells and restrict ends to verified observed days 1-730.
  output_population: Covered course spells
  exclusion_record: Record noncoverage and out-of-window reasons.
- step_id: s02
  input_population: Covered course spells
  operation: Apply completion map and collapse any qualifying exit to pupil indicator.
  output_population: Exit analysis sample
  exclusion_record: Record unknown-code failures.
model:
  model_id: exit_local_linear
  equation_or_algorithm: Within every retained stratum s fit  $Y_i = \alpha_s + \tau_s D_i + \beta_s X_i$ 
    in the audited finite window. Define  $N_s$  as audit_sample pupils in s and  $w_s = N_s / \sum_r N_r$ 
     $\tau_{\text{exit}} = \sum_s w_s \tau_s$ . A single saturated fixed fit returns all  $\tau_s$ ; aggregate w
    explicit w vector.
  target_statistic: tau_exit risk difference
  symbol_map:
  - symbol: E_i
    meaning: Exit-without-completion indicator.
    source_fields:
    - ELEV3_VTIL
    - AFG_ART
    - AUDD
    construction_variables:
    - exit_730_var
  - symbol: X_i
    meaning: Centered oriented score.
    source_fields:
    - SCORE
    construction_variables:
    - running_exit
  - symbol: D_i
    meaning: Red assignment indicator.
    source_fields:
    - SCORE
    construction_variables:
    - running_exit
  estimator_api: fit=fixest::feols(exit_730_var ~ 0 + i(stratum_id, red_assignment, ref=0) +
    + i(stratum_id, I(red_assignment*centered_score)), data=exit_rd_sample, weights=~1, clus
    tau_s=coef red terms; w_s=table(stratum_id)/nrow(data); tau_exit=sum(w_s*tau_s); covar
    se=sqrt(t(w)%*%V_tau)%*%w)
  weights: Observation weights are 1. Aggregation weights are exactly  $w_s = N_s / \sum_r N_r$  fr
    audited analysis sample; no cutoff-density or equal-stratum weighting.
  fixed_effects: Fully interacted rule-stratum intercepts and stratum-specific centered-sc

```

```

    on each side; no baseline covariate matrix.
reference_levels: Yellow red_assignment=0 within every rule stratum; centered_score=0.
uncertainty: Marginal cluster-robust covariance by first-test institution. For the school
    with m activated outcomes, Bonferroni simultaneous interval is estimate +/- qnorm(1-0.
    and adjusted_p=min(1,m*2*pnorm(-abs(estimate/SE))).
clustering: INSTNR primary; score mass point robustness.
diagnostics:
- Coverage continuity
- design rank
- leverage
- effective N
- cluster count.
actions:
- action_id: a01
  goal: Construct the 730-day exit indicator.
  consumes:
  - exit_audit_source
  - exit_source
  procedure:
  - Verify gate and lookup hash before reading spell outcomes.
  - Apply same-record window and completion predicates then collapse to one pupil.
  produces:
  - exit_sample
  assertions:
  - One row per pupil and every event traces to one spell.
  on_failure:
    route: mark_infeasible
    detail: Terminate exit experiment without substituting absence.
- action_id: a02
  goal: Fit registered exit models.
  consumes:
  - exit_sample
  procedure:
  - Fit the saturated stratum-specific finite-window model with exactly unit observation w
    INSTNR cluster covariance.
  - Compute N_s, w_s, weighted point estimate, covariance contrast, raw p, Bonferroni adjus
    simultaneous interval with m equal to the number of activated school outcomes.
  produces:
  - exit_fits
  assertions:
  - All stratum coefficients are finite, sum(w_s)=1 within 1e-12, and every w_s equals N_s
    within 1e-12.
  - Multiplicity m is 1 or 2 and equals activated school outcomes.
  on_failure:
    route: stop_experiment
    detail: Report exit inference infeasible.
- action_id: a03
  goal: Write compact exit result.

```

```

consumes:
- exit_fits
procedure:
- Extract target statistic interval and diagnostics.
- Apply fixed decision regions and save immutable JSON.
produces:
- exit_primary
assertions:
- Output decision recomputes exactly.
on_failure:
  route: downgrade_claim
  detail: Report no education-exit claim.
outputs:
- output_id: exit_sample
  path: preregistration/run/exit/sample.parquet
  format: Parquet
  grain: pupil
  fields:
    - PNR_hash
    - centered_score
    - red_assignment
    - exit_730
    - stratum_id
    - INSTNR
  produced_by: a01
  consumers:
    - a02
- output_id: exit_fits
  path: preregistration/run/exit/fits.rds
  format: RDS
  grain: fitted procedure
  fields:
    - procedure_id
    - estimate
    - standard_error
    - raw_p
    - adjusted_p
    - sim_ci_low
    - sim_ci_high
    - stratum_estimates
    - stratum_n
    - stratum_weights
  produced_by: a02
  consumers:
    - a03
- output_id: exit_primary
  path: preregistration/run/exit/primary.json
  format: JSON

```

```

grain: estimand
fields:
- tau_exit
- standard_error
- raw_p
- adjusted_p
- sim_ci_low
- sim_ci_high
- selected_window
- stratum_n
- stratum_weights
- decision_id
produced_by: a03
consumers:
- exit_change
- exit_negligible
- exit_inconclusive
quality_control:
  synthetic_dry_run: Synthetic course spells test day boundaries completion noncompletion
    and unknown codes.
  invariant_checks:
  - One pupil one outcome.
  - Every event traces to a qualifying spell.
  - Noncoverage is never zero.
  - Score matches audit.
  reconciliation: Pupil indicators reconcile to filtered spells and JSON to fit object.
  run_log: preregistration/run/exit/run_log.jsonl
  stop_conditions:
  - Gate mismatch.
  - Unknown exit code.
  - Rank failure.
  - Nonfinite fit.
compute_plan:
  fit_operations:
  - operation_id: exit_primary_fit
    calls_per_unit: 1
    fitted_units: 1
    repetitions: 1
    total_fits: 1
    justification: One primary exit outcome.
  - operation_id: exit_robustness_fits
    calls_per_unit: 1
    fitted_units: 6
    repetitions: 1
    total_fits: 6
    justification: Two clustering choices by three bandwidths.
  full_data_passes: 4
  largest_intermediate: Pupil-by-course-spell joined table.

```

```

    feasibility_note: Seven fits and four passes; family correction is deterministic from ac
    members.
decision_regions:
- decision_id: exit_negligible
  condition: Valid fit and sim_ci_low>=-0.03 and sim_ci_high<=0.03; evaluated first.
  parameters:
    - name: sesoi_exit
      value: 0.03
      unit: outcome-scale difference
      rationale: Frozen equivalence boundary.
    - name: family_alpha
      value: 0.05
      unit: familywise probability
      rationale: Bonferroni school-family level.
  interpretation: The simultaneous interval is contained in the SESOI bounds.
  claim_status: null_equivalent
- decision_id: exit_change
  condition: Valid fit, negligible condition false, and adjusted_p<=0.05; evaluated second.
  parameters:
    - name: family_alpha
      value: 0.05
      unit: familywise probability
      rationale: Bonferroni school-family level.
    - name: sesoi_exit
      value: 0.03
      unit: outcome-scale difference
      rationale: Used by the preceding region.
  interpretation: Evidence supports a nonzero local effect in the estimate sign, without an a
    SESOI claim.
  claim_status: supports
- decision_id: exit_inconclusive
  condition: All remaining cases, including adjusted_p>0.05, an interval crossing a SESOI bo
    implementation failure; evaluated last.
  parameters:
    - name: family_alpha
      value: 0.05
      unit: familywise probability
      rationale: Completes the partition.
    - name: sesoi_exit
      value: 0.03
      unit: outcome-scale difference
      rationale: Completes the partition.
  interpretation: Evidence is inconclusive or execution failed.
  claim_status: inconclusive
experiment_graph:
  entry_experiments:
    - assignment_audit
  activations:

```

- from: assignment_audit
on_decision: audit_pass
to: conviction_rd
meaning: Run primary conviction RD.
- from: assignment_audit
on_decision: audit_pass
to: absence_rd
meaning: Run absence RD.
- from: assignment_audit
on_decision: audit_pass
to: exit_rd
meaning: Run exit RD.
- from: assignment_audit
on_decision: audit_partial
to: conviction_rd
meaning: Run conviction RD because conviction gate passed.
- from: assignment_audit
on_decision: audit_partial
to: absence_rd
meaning: Run only if absence_gate is true; otherwise emit skipped terminal record.
- from: assignment_audit
on_decision: audit_partial
to: exit_rd
meaning: Run only if exit_gate is true; otherwise emit skipped terminal record.

terminals:

- from: assignment_audit
on_decision: audit_fail
terminal_state: reject_primary
meaning: Primary identification or feasibility failed; reject study.
claim_ceiling: no_claim
- from: conviction_rd
on_decision: conviction_benefit
terminal_state: conviction_benefit_complete
meaning: Beneficial primary result complete.
claim_ceiling: causal
- from: conviction_rd
on_decision: conviction_harm
terminal_state: conviction_harm_complete
meaning: Harmful primary result complete.
claim_ceiling: causal
- from: conviction_rd
on_decision: conviction_negligible
terminal_state: conviction_negligible_complete
meaning: Equivalence result complete.
claim_ceiling: causal
- from: conviction_rd
on_decision: conviction_imprecise
terminal_state: conviction_uncertain_complete

```

    meaning: Valid but inconclusive primary estimate complete; implementation failure is no_cl
    claim_ceiling: causal
- from: absence_rd
  on_decision: absence_change
  terminal_state: absence_change_complete
  meaning: Absence result complete.
  claim_ceiling: causal
- from: absence_rd
  on_decision: absence_negligible
  terminal_state: absence_negligible_complete
  meaning: Absence equivalence complete.
  claim_ceiling: causal
- from: absence_rd
  on_decision: absence_inconclusive
  terminal_state: absence_uncertain_complete
  meaning: Absence inference inconclusive or skipped.
  claim_ceiling: no_claim
- from: exit_rd
  on_decision: exit_change
  terminal_state: exit_change_complete
  meaning: Exit result complete.
  claim_ceiling: causal
- from: exit_rd
  on_decision: exit_negligible
  terminal_state: exit_negligible_complete
  meaning: Exit equivalence complete.
  claim_ceiling: causal
- from: exit_rd
  on_decision: exit_inconclusive
  terminal_state: exit_uncertain_complete
  meaning: Exit inference inconclusive or skipped.
  claim_ceiling: no_claim
completion_rule: Complete when audit terminates the study or every activated outcome experim
    exactly one terminal; inactive school experiments produce a skipped record and no claim.
synthesis_worlds:
- world_id: world_gate_failure
  triggering_pattern: Primary audit fails.
  substantive_interpretation: The registered causal question is not answerable with this assign
    data chain.
  allowed_claim: Feasibility failure only; no association or school substitute.
  next_research: Obtain authoritative rules or new data without inspecting effects.
- world_id: world_benefit
  triggering_pattern: Conviction benefit region, regardless of secondary pattern.
  substantive_interpretation: Red classification locally reduces recorded conviction by at leas
    school outcomes describe concordant or discordant pathways but not mediation.
  allowed_claim: Local classification-regime ITT on conviction under RD assumptions.
  next_research: Measure actual services and mechanisms in a new design.
- world_id: world_harm

```

triggering_pattern: Conviction harm region, regardless of secondary pattern.
 substantive_interpretation: Red classification locally increases recorded conviction by at least 10%
 SESOI; rival stigma or expectation mechanisms become salient but remain unproven.
 allowed_claim: Local harmful classification-regime ITT on conviction under RD assumptions.
 next_research: Study service and labeling mechanisms separately.

- world_id: world_negligible

triggering_pattern: Conviction negligible region, regardless of secondary pattern.
 substantive_interpretation: The study excludes conviction effects of plus or minus two percent
 locally.
 allowed_claim: Local equivalence within the registered bounds, not universal no effect.
 next_research: Examine smaller effects only with a prospectively larger design.
- world_id: world_uncertain

triggering_pattern: Any remaining valid or failed conviction fit after a passing gate.
 substantive_interpretation: Conviction direction or magnitude remains unresolved; secondary pattern
 cannot replace it.
 allowed_claim: Report estimate and uncertainty or implementation failure without a directional
 conclusion.
 next_research: Improve information or measurement without outcome-driven redesign.

synthesis_resolution:
 selection: ordered_precedence
 precedence:

- world_gate_failure
- world_benefit
- world_harm
- world_negligible
- world_uncertain

 unmatched_action: Treat any unmatched pattern as a protocol failure, disclose it, and make no
 claim.

multiplicity:
 families:

- 'Primary conviction singleton: one two-sided test at alpha 0.05.'
- 'School disengagement family: absence and exit, restricted to activated measures.'
- 'Audit family: density and seven predetermined continuity tests.'

 correction: For the activated school family of size m in $\{1,2\}$, compute raw two-sided Wald p
 adjusted $p_j = \min(1, m \cdot p_j)$, and simultaneous interval $\tau_j \pm q_{\text{norm}}(1-0.05/(2m)) \cdot \text{SE}_j$. The
 evaluates negligible first, change second, and inconclusive last. Conviction remains a single
 Audit uses Holm on its four Fisher tests per window, ordering by raw p then diagnostic order
 age, sex, origin.

reporting: Report stratum N_s and exact w_s , every stratum estimate, aggregate, raw and adjusted
 simultaneous bounds, activated family size, gate reasons, bootstrap failures, and all fit/

deviations:

permitted:

- Repairs of typographical code errors that do not alter fields, populations, variables, estimates,
 formulas, thresholds, or branches, documented before rerun.
- Data-security path changes with identical hashes and semantics.

prohibited:

- Inspecting outcomes to choose cutoff mappings, sample, horizon, bandwidth, polynomial order,
 clustering, outcome codes, or estimand.

- Replacing conviction with charges, police contact, generic decisions, absence, or exit.
 - Treating post-assignment disengagement as a confounder or claiming mediation.
 - Adding an unregistered fuzzy RD, service IV, uncontrolled association, or favorable subgroup
- disclosure:** Every deviation is timestamped with author, reason, affected outputs, outcome-ac, and expected inferential consequence; material deviations relabel affected analyses explor, no-claim.