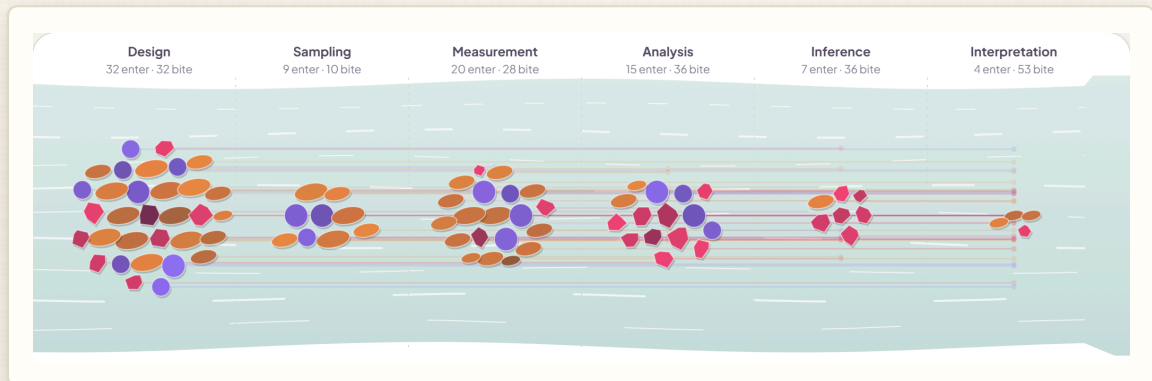




FALLACYScope

Find the trap *before the reviewer does*

FallacyScope — how to run a pre-mortem of your study against 87 paradoxes, fallacies and biases, stage by stage, and turn what you find into design changes and honest limitations.

Find the trap *before the reviewer does*

Most of the ways a study goes wrong are known in advance, have names, and have a canonical paper explaining them. This volume walks the worked study through them before any data exist, while a trap can still be designed out rather than confessed.

Site. <https://syahmedu.github.io/fallacyscope/>

Version. 1.0.1 (2026-10-18) · build 3702b3b+edits · 2026-10-18T15:45:22Z

Figures. Real screenshots of the live site, captured 2026-10-18 by `scripts/capture.mjs`; sample data shown in figures is labelled simulated where it is simulated.

Sources. 10 DOI-verified references, numbered in order of use. Nothing in this book is invented: counts and labels are read from the site or its published data.

Status. A user guide, not documentation of record. Where the site and this book differ, the site is right — please report it (see Version history).

Type. Fraunces, Plus Jakarta Sans and IBM Plex Mono (SIL Open Font License). Laid out with Paged.js.

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01

BEFORE THE DATA

Why run a pre-mortem

A reviewer's objections are mostly predictable. The traps that sink empirical papers have names, mechanisms and remedies, and most can only be fixed before data collection.

Flexible choices made after seeing the data can make almost any result look significant ¹, and remedies such as pre-registration work by fixing those choices in advance ². The same is true of design traps. Common-method bias is cheapest to prevent by separating the measurements in time or source, and hardest to repair statistically afterwards ³. A pre-mortem asks, before the study runs: if this paper were rejected, which named trap would the reviewer cite?

FallacyScope is a field guide to 87 such traps: 19 paradoxes, 27 fallacies and 41 biases, each with a worked example from the literature, the mechanism, how to detect and avoid it, the research stages where it bites, and its canonical source. The site lists 102 hand-verified sources across the 87 entries.

A PRE-MORTEM IS DONE WHEN...

- ☐ I have checked the design against the traps that enter at the design stage.
- ☐ I know which traps my sample is exposed to, and what data would show whether they bit.
- ☐ My analysis plan is written down before I see the outcomes.
- ☐ Every trap I could not design out is named in the limitations, with its direction of bias.

THE WORKED EXAMPLE – CONTINUED

The study (Volumes 5–12) tests whether job autonomy buffers the link between long shifts and burnout among nurses, with resources measured at wave 1 and outcomes at wave 2, three months apart (Volume 12). Before the survey goes out, this volume checks it against the traps.

02

THE WHOLE FIELD AT ONCE

Read the stream

The stream lays the 87 traps along the life of a study. It shows where traps enter, and where they finally bite.

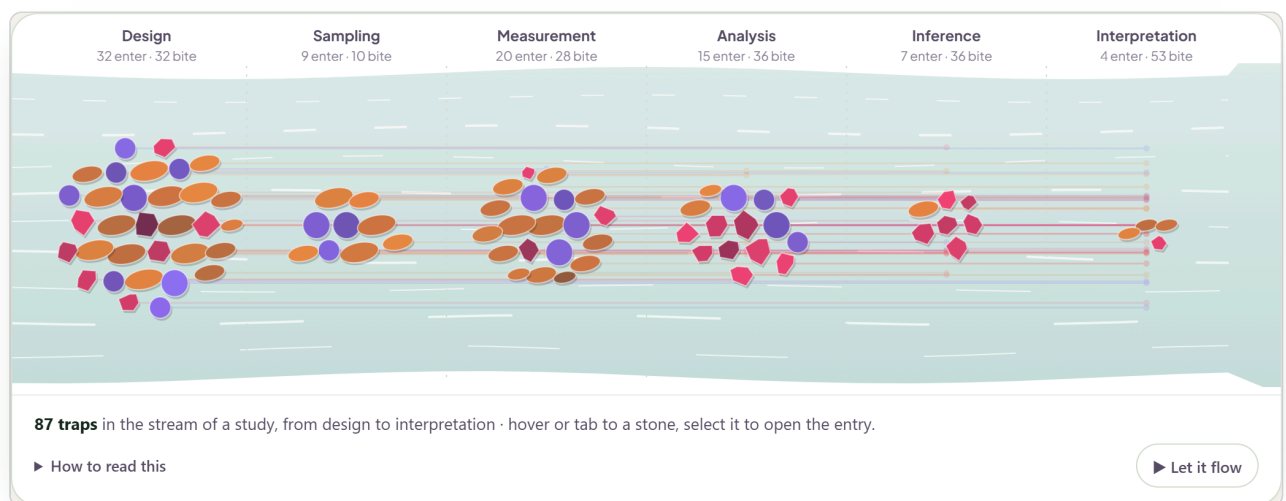


FIG 2.1 The stream: one stone per trap, dropped where it first bites, with a wake to the last stage it bites. Headers: **Design** 32 enter · 32 bite; **Sampling** 9 · 10; **Measurement** 20 · 28; **Analysis** 15 · 36; **Inference** 7 · 36; **Interpretation** 4 · 53.

Read the headers as a warning. Thirty-two traps enter at design, more than at any other stage. Only four enter at interpretation, yet 53 bite there. Most traps are planted early and discovered late: the reviewer finds them in your conclusions, but the remedy was in your design. That is why a pre-mortem starts at the left.

- 1 Hover or tab to a stone to light its wake; select it to open the entry.
- 2 Read the header counts: where traps enter, and where they bite.
- 3 Open **How to read this** for the encodings.
- 4 With reduced motion on, press **► Let it flow** to see the stream move.

Why it looks like this

The stream puts each trap at the stage where it first bites, so horizontal position, the most accurately read channel, carries the one thing the reader needs: where in a study it enters ⁴. Its wake runs to the last stage it bites, which turns a list of stages into a length.

Type is shown twice, by shape and by colour (round paradoxes, angular fallacies, flat biases), so it survives printing in grey and colour-blind viewing; redundant encoding costs nothing when the channel is otherwise unused ⁵. Size shows how many stages a trap bites, and weathering the age of its canonical source. The site says plainly that stacking and the water are layout, not data.

03

BY RESEARCH STAGE

Walk the study, stage by stage

The stage view turns the stream into a checklist. Start with design, and ask of each entry: could this happen in my study?

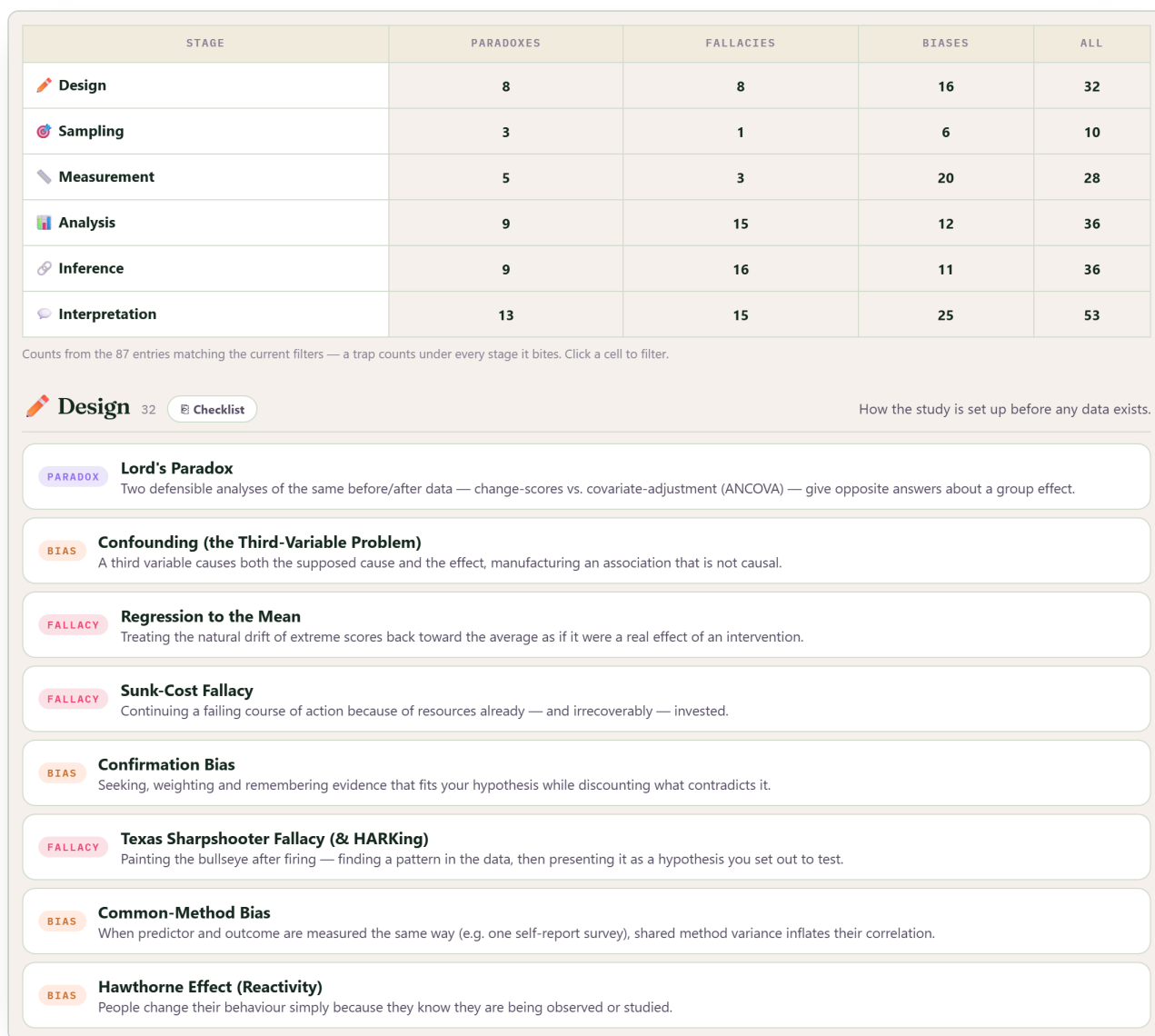


FIG 3.1 **By research stage** : the matrix of traps by stage and type (Design 8 paradoxes, 8 fallacies, 16 biases; 32 in all), then the Design list, with **Checklist** to copy it. The first entries: Lord's Paradox, Confounding, Regression to the Mean, Sunk-Cost Fallacy, Confirmation Bias, Texas Sharpshooter (& HARKing), Common-Method Bias, Hawthorne Effect.

Most entries will not apply. The work is to find the few that do, and to decide for each whether to design it out, measure it, or report it. For the worked study, the pre-mortem comes down to this table.

STAGE	TRAP (FALLACYScope ENTRY)	IN THIS STUDY	DECISION
Design	Common-Method Bias	All measures are nurses' self-reports.	Designed down: resources at wave 1, outcomes at wave 2 ³ .
Design	Cross-Sectional Mediation Fallacy	The study tests moderation, not mediation, but its JD-R account is a process.	Do not claim a process from two waves; describe associations ⁶ .
Design	Regression to the Mean	Wards are not selected on extreme burnout.	Keep it that way; if they were, change from wave 1 would mislead.
Sampling	Survivorship Bias	Nurses who burned out and left are not in the sample.	Report leavers during the study; see Chapter 5.

Sampling	Nonresponse Bias	Some wave-1 participants will not return.	Compare returners and non-returners on wave-1 scores ⁷ .
Sampling	Range Restriction	Staying nurses may have a narrower range of burnout.	Report the spread; expect attenuated associations ⁸ .
Analysis	Garden of Forking Paths	Many choices: covariates, exclusions, how to probe the interaction.	Pre-register the analysis plan (Volume 4) ^{9,2} .
Inference	Correlation ≠ Causation	Two waves of observational data.	Write "associated with", not "reduces" (Volume 7).

THE COUNTS, AND THE JUDGEMENT

A trap counts under every stage it bites, so the stage totals add up to more than 87. The table above is one study's judgement, not the site's: FallacyScope lists the traps; deciding which apply is the researcher's work.

04

ONE TRAP, IN FULL

Read an entry

Each entry has the same anatomy: the trap in a sentence, a worked example from the literature, why it happens, how to detect and avoid it, where it bites, and its sources.

BIAS

MEASUREMENT

×

Common-Method Bias

► Explainer — narrated

When predictor and outcome are measured the same way (e.g. one self-report survey), shared method variance inflates their correlation.

WORKED EXAMPLE

Podsakoff et al. (2003): asking the same respondents about both job satisfaction and their own performance in a single questionnaire can manufacture or exaggerate the link, through consistency motifs, mood and item context.

WHY IT HAPPENS

Variance attributable to the measurement method, rather than the constructs, is shared across items — biasing observed relationships, usually upward.

♡ HOW TO DETECT & AVOID

Separate the sources or time the measurements; vary scale formats; use marker variables and CFA-based controls; pre-empt it at the design stage.

WHERE IT BITES

Design

Measurement

Analysis

CONNECT IT IN THE SUITE

➤ Run a method-bias / CFA check (ToolsScope)

Search the 9,388-paper corpus for it

RELATED TRAPS

Range Restriction (Attenuation) →

Jingle-Jangle Fallacy →

Goodhart's Law →

← Campbell's Law

← Dunning-Kruger Effect

← Cross-Sectional Mediation Fallacy

← Endogeneity (Unwarranted Causal Claims)

← Social Desirability Bias

← Halo Effect

SOURCES — VERIFY EACH

Podsakoff, P. M., MacKenzie, S. B., Lee, J.-Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology*, 88(5), 879–903. doi.org/10.1037/0021-9010.88.5.879

Bibliographic facts are real and hand-checked; follow the link to confirm before citing.

FIG 4.1 The entry for **Common-Method Bias**: the trap, a worked example from Podsakoff et al. (2003), why it happens, how to detect and avoid it ("Separate the sources or time the measurements; vary scale formats; use marker variables and CFA-based controls; pre-empt it at the design stage."), the stages it bites, suite links, related traps and the source with its DOI.

The *How to detect & avoid* box is the part to act on. The worked study already separates the measurements in time. It can also vary formats, since the OLBi uses four agreement points and the UWES-9 a seven-point frequency scale, and it can check the factor structure, which ToolsScope runs (Volume 7). The related traps are the next entries to read: Social Desirability Bias and the Cross-Sectional Mediation Fallacy both apply to a self-report survey.

- 1 Open an entry from the stream, the list or a search.
- 2 Read the worked example, then the *How to detect & avoid* box.

- 3 Follow **Connect it in the suite** to act on it (for example, a CFA check in ToolsScope).
- 4 Read the related traps; arrows show which way the link runs.
- 5 Copy the source with **APA** or **DOI** , and open the DOI before citing it.
- 6 ▶ **Explainer – narrated** walks through the entry's own text, aloud.

CITE THE SOURCE, NOT THE SUMMARY

Every entry names a real source, and every DOI shown was checked by hand. The entry is still a summary. Cite the source you have read, not the field guide, and read it at the page you cite.

05

SAMPLING TRAPS

Who is missing from the sample

A workforce study samples the people still at work. For burnout, that is exactly the problem.

BIAS
SELECTION / SAMPLING

X

Survivorship Bias

▶ Explainer — narrated

Drawing conclusions only from the cases that survived a selection process, while the ones that dropped out are silently missing.

WORKED EXAMPLE

Wald's WWII team realised the bullet holes on planes that returned showed where a plane could be hit and still fly home; the armour belonged where holes were absent — on the planes that never came back (Mangel & Samaniego, 1984). In finance, funds that die vanish from databases, inflating the average return of 'all funds' (Brown et al., 1992).

WHY IT HAPPENS

The sample is conditioned on survival, so failures are systematically absent and the surviving distribution is biased toward success.

HOW TO DETECT & AVOID

Reconstruct the full at-risk set including dropouts and failures. Always ask: what data is missing precisely because it didn't survive?

WHERE IT BITES

Sampling
Inference
Interpretation

CONNECT IT IN THE SUITE

Search the 9,388-paper corpus for it

RELATED TRAPS

Berkson's Paradox →
Publication Bias (File-Drawer Problem) →
Range Restriction (Attenuation) →
Friendship Paradox →
← Streetlight Effect (Drunkard's Search)
← Immortal Time Bias
← Low-Birth-Weight Paradox
← Collider (Selection) Bias
← Nonresponse Bias
← Matthew Effect (Cumulative Advantage)
← Outcome Bias

SOURCES — VERIFY EACH

Mangel, M., & Samaniego, F. J. (1984). Abraham Wald's work on aircraft survivability. *Journal of the American Statistical Association*, 79(386), 259–267. doi.org/10.2307/2288257
APA
DOI

Brown, S. J., Goetzmann, W., Ibbotson, R. G., & Ross, S. A. (1992). Survivorship bias in performance studies. *Review of Financial Studies*, 5(4), 553–580. doi.org/10.1093/rfs/5.4.553
APA
DOI

Bibliographic facts are real and hand-checked; follow the link to confirm before citing.

FIG 5.1 The entry for **Survivorship Bias**: "Drawing conclusions only from the cases that survived a selection process, while the ones that dropped out are silently missing." Its worked example is Wald's analysis of returning aircraft (Mangel & Samaniego, 1984); its remedy: "Reconstruct the full at-risk set including dropouts and failures."

The aircraft example ¹⁰ maps onto the study directly. Nurses whose burnout drove them to leave are not on the ward when the survey arrives. The sample is conditioned on staying, which plausibly narrows the range of burnout and weakens the associations the study can see; the Range Restriction entry describes that

mechanism⁸. Attrition between waves adds a second filter: those who do not return at wave 2 may differ from those who do, and a response rate alone does not say whether they do⁷.

WORKED EXAMPLE

The study cannot survey nurses who have already left. It can reconstruct part of the at-risk set: ask the hospitals for the number of nurses who left the participating wards during the study, report it beside the sample, and compare wave-1 scores of those who returned at wave 2 with those who did not. If the non-returned were more exhausted at wave 1, the wave-2 results understate burnout, and the paper should say so.

06

THE OBJECTIONS YOU WILL MEET

Defend it

A pre-mortem pays off in the review. These are the objections the table in Chapter 3 prepares you for.

REVIEWER

"Self-reported predictors and outcomes inflate the association."

YOUR ANSWER

Resources were measured at wave 1 and outcomes at wave 2, a recommended procedural remedy ³; the scales use different response formats; a confirmatory factor analysis is reported.

REVIEWER

"Burned-out nurses had already left."

YOUR ANSWER

Agreed, and reported: the number of leavers from participating wards during the study, and a comparison of wave-1 scores between returners and non-returners. The likely direction is attenuation, so the estimates are conservative.

REVIEWER

"How many analyses did you try?"

YOUR ANSWER

One, specified before data collection and pre-registered; anything else is labelled exploratory ^{2,9}.

REVIEWER

"This shows autonomy reduces burnout."

YOUR ANSWER

It does not, and the paper does not claim it. Two waves of observational data show an association consistent with the JD-R account ⁶.

MODEL PARAGRAPH

Several limitations follow from the design. Although predictors and outcomes were measured three months apart to reduce common method variance ³, all study variables except shift length were self-reported. The sample is restricted to nurses still employed on the participating wards; nurses who had left, possibly because of burnout, could not be surveyed, which is likely to have narrowed the range of burnout and attenuated the associations observed ⁸. We report the number of leavers during the study and compare wave-1 scores of participants who did and did not complete wave 2 ⁷. Finally, two waves of observational data cannot establish that autonomy causes weaker associations between shift length and burnout ⁶.

Model paragraph for the illustrative study. Each limitation names its mechanism and its likely direction of bias, which a reviewer can check; adapt it to what your data actually show.

07

REFERENCE

FallacyScope at a glance

The views and entry fields, for when you know what you want and need to find where it lives.

PART	USE IT TO...
Stream	See all 87 traps by the stage where they enter and the stages they bite; select a stone to open it.
 Browse	Filter by type (paradox, fallacy, bias) and family (statistical, causal, selection, measurement, levels, reasoning, decision, integrity, design); search by name.
 By research stage	The stage × type matrix (click a cell to filter) and a list per stage, with  Checklist to copy it as markdown.
 Quiz	Test yourself: identify the trap from a scenario.
 Field guide	Print the guide, or save it as a PDF.
Entry	Trap, worked example, why, how to detect and avoid, stages, suite links, related traps, sources;  Explainer – narrated .

LIBRARY	COUNT
Traps	87 (19 paradoxes, 27 fallacies, 41 biases)
Hand-verified sources	102
Research stages	6

WHERE THE ENTRIES COME FROM

Every entry names a real, hand-verified canonical source; a DOI is shown only where it was verified, and omitted rather than guessed. Worked examples come from the cited literature, not invented cases. ResearchFlow shows the same 87 entries, verbatim, under its stages.

Glossary

Paradox

A result that is counter-intuitive but real, such as a trend reversing when groups are pooled.

Fallacy

An error of inference: a conclusion that does not follow from the evidence.

Bias

A systematic distortion in data, measurement or judgement.

Research stage

One of six stretches of a study: design, sampling, measurement, analysis, inference, interpretation. A trap is listed under every stage it bites.

Enter · bite

In the stream: the traps that first appear in a stage, and all the traps that affect it.

Pre-mortem

Imagining, before the study runs, that it has failed or been rejected, and listing why; here, checking the design against named traps.

References

Every reference was resolved by its DOI against Crossref (or DataCite) and matched on first author and year before it could be cited — 10 sources in this volume. Verification date per entry is kept in `references/verified.json`.

- 1 Simmons, J. P., Nelson, L. D., & Simonsohn, U. (2011). False-Positive Psychology. *Psychological Science*, 22(11), 1359–1366. <https://doi.org/10.1177/0956797611417632>
- 2 Nosek, B. A., Ebersole, C. R., DeHaven, A. C., & Mellor, D. T. (2018). The preregistration revolution. *Proceedings of the National Academy of Sciences*, 115(11), 2600–2606. <https://doi.org/10.1073/pnas.1708274114>
- 3 Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies.. *Journal of Applied Psychology*, 88(5), 879–903. <https://doi.org/10.1037/0021-9010.88.5.879>
- 4 Cleveland, W. S., & McGill, R. (1984). Graphical Perception: Theory, Experimentation, and Application to the Development of Graphical Methods. *Journal of the American Statistical Association*, 79(387), 531–554. <https://doi.org/10.1080/01621459.1984.10478080>
- 5 Munzner, T. (2014). *Visualization Analysis and Design*. A K Peters/CRC Press. <https://doi.org/10.1201/b17511>
- 6 Maxwell, S. E., & Cole, D. A. (2007). Bias in cross-sectional analyses of longitudinal mediation.. *Psychological Methods*, 12(1), 23–44. <https://doi.org/10.1037/1082-989X.12.1.23>
- 7 Groves, R. M. (2006). Nonresponse Rates and Nonresponse Bias in Household Surveys. *Public Opinion Quarterly*, 70(5), 646–675. <https://doi.org/10.1093/poq/nfl033>
- 8 Sackett, P. R., & Yang, H. (2000). Correction for range restriction: An expanded typology.. *Journal of Applied Psychology*, 85(1), 112–118. <https://doi.org/10.1037/0021-9010.85.1.112>
- 9 Gelman, A., & Loken, E. (2014). The Statistical Crisis in Science. *American Scientist*, 102(6), 460. <https://doi.org/10.1511/2014.111.460>
- 10 Mangel, M., & Samaniego, F. J. (1984). Abraham Wald's Work on Aircraft Survivability. *Journal of the American Statistical Association*, 79(386), 259. <https://doi.org/10.2307/2288257>

Version history & errata

This guidebook is version-controlled. Corrections are made in its source, the version number is raised, and the change is recorded here and in `CHANGELOG.md`. Report an error with the page number and the version printed in the footer.

VERSION	DATE	CHANGES
1.0.1	2026-10-18	Series back to 13 volumes (Throughline CS dropped: a separate product, not one of the Lazy Research Lad sites): covers and title pages now read 'of 13'. Text and figures unchanged.
1.0.0	2026-10-18	First edition, written as a research guide on the series' worked study: reading the stream, a pre-mortem by research stage, reading an entry, sampling traps for a workforce study, analysis traps, reviewer objections and a model limitations paragraph. Figures captured 18 October 2026 from the live site; 5 new verified references.

Errata

No errata recorded for this version.