

## Verification Reports – Guide for Authors

Verification Reports are a form of empirical article in which authors evaluate the claims in published research through reanalysis of the original study data. The purpose of this format is to assess the credibility of previous conclusions by repeating the original analyses to test computational reproducibility or, in addition, by reporting new analyses to test robustness.<sup>1</sup>

Verification Reports are designed to focus on the same (or closely related) claims as the original study using the same data. They are not appropriate for asking a completely different question of the same data, or for asking the same question using new data. Submissions that report tests of both reproducibility and robustness are preferred, and tests of robustness should always be accompanied by tests of reproducibility.

In some cases, authors may be uncertain whether robustness checks will be judged to be asking a “completely different question” compared with the original study and therefore judged ineligible. The definition of a “completely different question” is necessarily subjective and will be assessed by editors on a case-by-case basis, but a reasonable heuristic to suggest suitability is if a positive answer could be given to the following questions: (a) could the robustness checks potentially strengthen or weaken the original conclusions? (b) in the case of hypothesis-driven research, will the re-analysis test the same hypotheses as the original study? Authors are welcome to contact the editorial office for presubmission advice about specific scenarios ([cortex@ed.ac.uk](mailto:cortex@ed.ac.uk)).

### Submission eligibility

All authors of a Verification Report must be independent of the original study and its authors. In practical terms, this means they cannot be authors or co-authors of the original work. They also cannot be active collaborators (e.g. holding grant funding in the previous three years or other close connections) with any of the original authors. Submitting authors are asked to confirm this condition as part of the submission process.

By default, all empirical articles published in *Cortex* fall within the disciplinary scope of Verification Reports, although this does not guarantee acceptance (see review criteria below). The editors will also consider submissions focusing on research published in other journals. Where the submitting authors have any questions about eligibility, or plan to target a study published in another journal, we recommend submitting a presubmission enquiry to [cortex@ed.ac.uk](mailto:cortex@ed.ac.uk). Where the submitting authors intend to investigate multiple previous studies (e.g. to investigate several articles within the same field), authors should combine their attempts into a single manuscript.

Verification Reports are not subject to a word limit but should be written as concisely as possible.

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<sup>1</sup> ‘Robustness’ can be defined as the stability of the original findings when the same data are reanalysed using different assumptions, methods, or parameters (e.g. transformation, exclusion criteria; see [here](#) for discussion). The applicability of robustness goes beyond applying convergent inferential statistical methods and can be assessed at all stages of data processing. For example, in fields involving complex analyses such as neuroimaging, the specific version of analysis software may influence research results. The Verification Reports format is open to submissions that address this issue, for instance by reporting the same analyses on the same data using different software versions.

## Data availability

A Verification Report can be published only in cases where the submitting authors have either obtained the original study data or have exhausted all reasonable attempts to obtain them.<sup>2</sup> In cases where the data are already in the public domain, authors can usually submit a Verification Report without needing to contact the original authors, provided any public datasets are cited in accordance with [Standard #1 of the journal's Transparency and Openness Promotion \(TOP\) guidelines](#). In cases where the data are not in the public domain, the submitting authors should request the necessary data and analysis code from the original authors or relevant data custodian, noting the intention to submit a Verification Report, and stating that according to the policy at *Cortex*, the authors of the original study are not eligible to serve as co-authors of the report. Submitting authors are responsible for ensuring that they adhere to any legal or ethical restrictions in the handling, distribution, and (re)analysis of the data and code. The legal and ethical conditions of reuse, and any restrictions therein, must be noted in the published Verification Report in accordance with the journal's TOP guidelines policy.

Submitting authors have two options in cases where sufficient data and/or code to perform complete tests of reproducibility or robustness cannot be obtained from the original authors. The first option is to submit a normal Verification Report if sufficient data/code are available to permit partial but informative testing. Where none of the original data or code can be retrieved, a Verification Report may be possible if the report is instead based on analyses of summary statistics in the original article (e.g. using tools such as [GRIM](#), [GRIMMER](#), [SPRITE](#), [statcheck](#), or other methods). Alternatively, where no informative testing of reproducibility or robustness is possible, authors may submit an abbreviated variant of a Verification Report called a Verification Note (see below).

## Submissions for which original study data are available

Verification Reports are assessed according to the value of the question and quality of the method and (re)analysis. Whether the results of the (re)analysis confirm or disconfirm the claims of the original study will be irrelevant to editorial decisions.

The review process takes place over two stages. Authors initially submit a Stage 1 manuscript including only an Abstract, Introduction and Method, with any results known to the authors temporarily redacted. The Stage 1 submission, including the Abstract, must also avoid anticipating the findings or conclusions. The Stage 1 manuscript should include a brief introduction to the topic, a clear justification of the importance of the verification attempt, and a detailed protocol describing the (re)analyses. In cases where the study data are not publicly available, authors can submit their Stage 1 manuscript prior to analysing the data, provided they have secured the necessary agreement from the original authors to make the data available. In cases where the submitting authors are already in possession of the data (with permissions secured from the appropriate data

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<sup>2</sup> The definition of what constitutes “reasonable” will be judged on a case-by-case basis by the editors, but as general guidance, attempts to obtain data may be considered reasonably exhausted where the authors of the Verification Report have received an explicit refusal from the data owners/curators to share the data, where attempts to communicate with the data owners/curators through all available channels (email, telephone) have repeatedly failed, where the data owners/curators are either deceased or no longer exist, or where the data are confirmed as being lost or destroyed.

owners/curators) or it is publicly accessible, they have the option to either (a) submit prior to analysing the data (with the Stage 1 manuscript and cover letter noting that data have not yet been analysed), or (b) to submit the Stage 1 manuscript *after* completing the (re)analyses but ensuring that all mention of the results is redacted, including the Results and Discussion sections in their entirety.

The Stage 1 manuscript should be accompanied by a cover letter that includes the following:

- A brief case for the importance of the verification attempt, independently of the results
- A statement affirming (a) that none of the authors of the Verification Report were authors or co-authors of the original work, and (b) that none of the authors of the Verification Report are active collaborators of any of the authors of the original work (including holding shared grant funding in the previous three years or any other close connections). Where authors are in doubt about the eligibility of a submission on these grounds, please contact the editorial office in advance of submission ([cortex@ed.ac.uk](mailto:cortex@ed.ac.uk)).
- A statement making clear whether the authors are submitting their Stage 1 manuscript prior to acquiring the data (and if so, a confirmation that all necessary permissions to acquire and reanalyse the data have been granted by the original authors/data custodian) OR instead whether they have already acquired the data and completed the (re)analyses but with the results redacted.

Stage 1 Verification Reports are assessed according to the following criteria:

1. *The relevance of the verification attempt to the disciplinary remit of Cortex.* Disciplinary fit will be assessed by the editors prior to in-depth review and manuscripts that fall beyond the journal's scope (neuropsychology, cognitive psychology cognitive neuroscience) will in most cases be desk rejected. Submissions focusing on published empirical articles at *Cortex* will automatically pass this criterion.
2. *The value of the verification attempt.* The editors will assess the importance of the verification attempt prior to in-depth review. The value of a Stage 1 manuscript may be diminished where the editors or reviewers judge that the original claims have already been subjected to sufficient evaluation (e.g. through prior Verification Reports or other means) and a more recent replication would serve as a more informative target for verification. Verification attempts that take into account the full basis of published claims are also more likely to be accepted. For example, where the conclusions of the original article were based on multiple studies within one article, a Verification Report may be stronger where it assesses the reproducibility and/or robustness of all studies in the article rather than a subset. Authors are also welcome to submit a single Verification Report scrutinising multiple studies and datasets. Submissions that propose tests of both reproducibility and robustness will receive higher priority than either reproducibility or robustness alone. Submissions that propose tests of robustness without also proposing tests of reproducibility are unlikely to satisfy this criterion. Editors and reviewers will assess the value of the verification attempt independently of the results.

3. *The methodological validity of the reported (re)analyses.* All (re)analyses must be clearly justified, statistically defensible, and designed to interrogate either the reproducibility of the original analyses or the reproducibility of the original analyses plus robustness of the original claims using new analyses. In general, submissions that seek to use the original data to answer different questions from the original study will be desk rejected.

Manuscripts that are reviewed favourably at Stage 1 will receive an *in-principle acceptance (IPA)*, similar to the policy for [Registered Reports](#). IPA commits the journal to publishing the completed verification attempt regardless of the eventual results, provided the submitting authors adhere to their approved protocol and that the conclusions are based on the evidence obtained. Following IPA, authors are required to publicly register their Stage 1 manuscript at <http://osf.io/rr> (instructions on how to do so will be contained in the Stage 1 acceptance letter). Authors can then resubmit a Stage 2 manuscript that includes the results of the verification attempt plus a Discussion and Conclusion.

Stage 2 Verification Reports are assessed according to the following criteria:

1. *Adherence to protocol.* Authors must follow the protocol approved at Stage 1. In cases where the results were unknown to the submitting authors until after Stage 1 acceptance, deviations from protocol (including altered or additional analyses) may be permitted to account for unanticipated characteristics of the now-observed data. Any such deviations must be transparently flagged and clearly justified.
2. *The extent to which the conclusions of the (re)analyses are based on the evidence obtained.* The submitting authors must present an appropriately balanced and unbiased interpretation of the results that takes into account limitations of both the original study and the (re)analyses.

At Stage 2, the abstract should make clear whether or not the original claims were verified by the (re)analyses, and the title can also be updated. The Stage 2 manuscript (main text) must include a direct URL to the registered Stage 1 manuscript, using one of the following statements:

- If the authors were already in possession of the data at Stage 1 submission AND had knowledge of the results of the (re)analyses prior to IPA, then the following statement should be included: “This article received results-blind in-principle acceptance (IPA) on [date]. Following IPA, the accepted Stage 1 version of the manuscript, not including results and discussion, was preregistered on the OSF [URL TO PUBLIC PROTOCOL]. This preregistration was performed after data analysis.”
- If the authors were either NOT in possession of the data prior to IPA (and instead have secured permission to receive the data following IPA) or were in possession of the data prior to IPA but had not yet analysed it, then the following statement should be included: “This article received results-blind in-principle acceptance (IPA) on [date]. Following IPA, the accepted Stage 1 version of the manuscript, not including results and discussion, was preregistered on the OSF [URL TO PUBLIC PROTOCOL]. This preregistration was performed prior to data analysis.”

## **Submissions for which original study data are NOT available**

Where the submitting authors have requested data from the original authors or relevant data custodian but have been unable to obtain the necessary access, the authors should submit a Verification Note rather than a Verification Report. A Verification Note consists of an extended abstract justifying the importance of verifying the original study in question and documenting the attempt to obtain the original data, the reason(s) for the lack of data availability (e.g. request denied or unanswered by the original authors or data custodian, together with the explanation for any refusal such as lack of legal or ethical permission; data no longer in existence; original authors deceased or otherwise not contactable), and a conclusion that the claims in the original article cannot be independently verified. Submissions must focus exclusively on the facts and not include any judgments about the integrity of the original authors.

A Verification Note should be accompanied by a cover letter including documentary evidence of the data request (e.g. emails, scans of written correspondence or other evidence). These materials will be assessed by the editors at submission and will not be published. However, where possible the editors will usually attempt to contact the original authors or relevant data custodian to confirm the accuracy and completeness of the submitting authors' account of events. Publication cannot proceed until the editors are satisfied that the reasons for lack of data availability provided by the submitting authors are complete and factually correct. Editors (and in some cases reviewers) will also assess submissions according to the value of the (hypothetical) verification attempt and, where the verification would have targeted a paper not published in *Cortex*, whether the original study falls sufficiently within the *Cortex* disciplinary remit.

## **Reviewer selection**

Judging the importance and validity of a reanalysis can benefit from intimate knowledge of the original data; therefore the authors of the original study may be invited to review a Verification Report even when they have engaged in prior contact with the submitting authors. For this reason, editors cannot guarantee that any requests by the submitting authors to exclude the original authors from the review process will be honoured. However, in assessing the reviews, the editors will take into account the risk that authors of the original work may have a vested interest in a particular outcome being accepted or rejected.

Like all empirical articles at *Cortex*, Verification Reports will adhere to the TOP guidelines and are eligible to be awarded Badges for Open Practices. In some cases, a Verification Report or Verification Note may be accompanied by an editorial comment, replies from the original authors, or by one or more Discussion Forum articles.

# VERIFICATION REPORTS: WORKFLOW

