Editorial: Reporting Guidelines for Psychopharmacology

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Introduction

Robust and generalizable data, and the full and transparent reporting of those data, are key to drawing the right conclusions, deciding on next experimental steps and achieving scientific progress (Steckler, 2015). Notably, many scientific articles, not just those in the field of psychopharmacology, lack sufficient methodological detail (Vasilevsky et al. 2013) and important information on experimental design (Bebarta et al., 2003; Hirst et al., 2014; Kilkenny et al., 2009; Macleod et al., 2015; McCance, 1995; Vesterinen et al., 2011). These details are essential to allow the reader to understand what exactly was done in a study, to judge the quality of the data, and to repeat the study. Accordingly, many scientific journals are emphasizing guidelines for the full and transparent reporting of data (Curtis and Abernethy, 2015; Curtis et al., 2015; Kenall et al., 2015; Kilkenny et al., 2011; Nature Publishing Group, 2014; Nosek et al., 2015).

To help authors in Psychopharmacology to continue to produce high quality articles containing all the information necessary to judge the rigor of a study, to improve reporting practice and to enhance the impact of articles published in the journal, the editors of Psychopharmacology have agreed on the following guidelines, in accordance with Springer's long-standing policy on the full and transparent reporting of data and experimental design:

Abstract

The Abstract should contain the purpose, methods, results and conclusions. In the results, the effect size should be included if possible.

Experimental design and statistics

The Methods section should provide information sufficient to allow replication of the work and full details on the statistical methods used. The figure legends should provide information essential to interpreting the data presented. The following information should be included in the Methods:

1. The exact sample size (*n*) for each experimental group/condition (as a number, not a range).
2. An explanation of how the sample size was chosen for each experiment, including power analysis where appropriate.
3. A description of sample collection that enables the reader to understand whether the samples represent technical or biological replicates, and an explanation of inclusion/exclusion criteria if data samples or subjects were excluded from the analysis (outlier criteria).
4. A description of how samples/animals were allocated to experimental groups and processed, and full details of the randomisation procedure used (if relevant).
5. A statement on whether the investigator was blinded to group assignment and outcome assessment, and how this blinding was achieved and evaluated (if relevant).
6. How many times each experiment shown was replicated (if applicable).
7. Primary and secondary endpoints/measures should be specified.
8. Information on the statistical methods and measures used. Authors should indicate whether tests were one-sided or two-sided and whether adjustments were made for multiple comparisons. The figure legends should indicate whether medians or means are shown, whether error bars are standard deviations (SD), standard error of mean (SEM) or confidence intervals, and should include the number of data points per group used to generate the figure.
9. A justification for the appropriateness of the statistical test used should be provided, e.g., whether data meet the assumptions of the tests (e.g., normal distribution), whether the variation within each group of data has been estimated, and whether the variance observed is similar between the groups that are being statistically compared.
10. Systematic reviews should follow recognised guidelines on conduct and reporting (e.g., PRISMA: http://www.prisma-statement.org/).

If the study involves human participants, authors should refer to the relevant reporting guidelines from the EQUATOR Network: http://www.equator-network.org/.

Availability of Data

Authors are encouraged to deposit key raw and all processed datasets on which the conclusions of the paper rely in publicly available repositories (e.g., using Dryad (http://datadryad.org/), FigShare (http://figshare.com/), the Neuroscience Information Network (http://www.neuinfo.org/about/index.shtm), OpenfMRI (https://openfmri.org/)). Alternatively, the data may be presented in the main paper or supporting files (e.g., as Supplementary Material), in an annotated, machine-readable format whenever possible. Links to deposited datasets or datasets in additional files should be explicitly referenced in a section entitled “Availability of data and materials”.

If computer code was used to generate results that are central to the paper’s conclusions, a statement should be included in the “Availability of data and materials” section to indicate whether and how the code can be accessed, including version information as necessary and information on possible restrictions on availability.

The editor may specifically request that data be made publicly available. If data cannot be deposited in response to such a request, reasons should be provided to the editor and in the "Availability of data and materials" section. Under such circumstances, the editor will determine whether the manuscript can still be considered for publication. Whether or not made publicly available, data should, if ethically appropriate, be made available to other interested scientists upon request.

Appropriate credit should be given to the originators of the raw data. Third parties using the data for further analysis and publication should cite the source, which could be the publication in Psychopharmacology or elsewhere.

Resources

A description of all resources used with enough information to be uniquely identified should be included as a Methods subsection entitled 'Resources'.

- Antibodies: source, characteristics, dilutions and how they were validated for the system under study should be reported.
- Cell lines: source, whether identity has been authenticated and whether cell lines were tested for mycoplasma contamination should be reported.
- Animals: source, species, strain, sex, age, husbandry, inbred and strain characteristics of transgenic and mutant animals should be reported.
- Tools (software, databases and services): standard tool names, provider and version number, if available, should be reported.
- Test compounds: source, purity, chemical structure (if not published previously), salt form, formulation, vehicle, relevant pharmacokinetic and pharmacodynamics properties in the relevant species, e.g., plasma and brain concentration, brain penetration, half-life, stability, affinity, selectivity, target engagement (if not published previously) should be reported. For information already reported elsewhere, the relevant references should be provided. If that information is not available, it remains at the discretion of the editor to decide whether this is acceptable. Test compounds should be tested in appropriate concentration or dose-response.

  Work on the actions of biological extracts of unknown chemical composition, i.e., of a mixture of ingredients that is insufficiently defined and/or of unknown concentrations that might affect the results, is normally not considered for publication. Clinical studies using plant materials with unknown or uncontrolled constituents are discouraged. Exceptions will be made if the plant materials are highly standardized and well characterized (e.g., tobacco; cannabis with specified cannabinoid content). If the pharmacological actions of all the relevant components are taken into account, studies with certain biological materials of uncertain composition may be considered for publication in Psychopharmacology.

Authors are also encouraged to provide Research Resource Identifiers (RRIDs) for antibodies, organisms and tools (Resource Identification Portal (https://scicrunch.org/resources).

While we realize that our new guidelines will cause additional work for authors, we consider these factors to be crucial elements in the reporting of scientific findings in our field and are convinced that the gain of the extra information provided will greatly outweigh this effort and will further increase the impact of the articles published in Psychopharmacology.

Acknowledgements

The Reporting Guidelines for Psychopharmacology are modified from guidelines recently published by the BioMed Central Reproducibility Working Group (http://www.genomebiology.com/authors/instructions/minimum_standards_reporting; see also Kenall et al., 2015).

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