

Open Science

PRACTICES AND GUIDELINES – INSTITUTE OF PSYCHOLOGY

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1. Open Science – Background and relevance

Why Open Science?

Open Science is a timely topic that is becoming increasingly important in psychological research and on the research policy agenda, both nationally and internationally. The Open Science movement proposes a transition to a more open and participatory way in which we practice science. The main goal of the Open Science movement is to increase transparency and collaborative sharing in all research stages from conception to publishing and evaluation of research. Ultimately, such an approach should lead to more robust and efficient science, as well as improved access to scientific results for everyone. Therefore, [Open Science](#) may not only help to combat the [replication crisis](#), but should also increase the scientific and societal impact of research in general.

Additionally, adopting Open Science practices is becoming more essential for researchers as funding organizations maintain Open Science-related demands and require proposals to include a data management plan, the involvement of a data steward, and open access publications resulting from funding projects.

Open Science practices

In line with Leiden University's mission to stimulate all aspects of Open Science, and the recommendations by the university's [Open Science Task Force](#), the Institute of Psychology also strongly supports Open Science practices. This document describes different Open Science practices that are either encouraged and/or required during the different research stages within the Institute of Psychology, including: preregistration and registered reports, research data management, open access publication, open data, open code, and open software. One major general goal of all these good practices is to create more awareness about the value of Open Science among academics; and that through this awareness, academics will improve how science is practiced.

Note that the Open Science practices are encouraged by the institute are not limited to what is listed in this guideline. Nor should what is described in this guideline be considered as the holy grail of Open Science. For instance, although the institute acknowledges [citizen science](#) as an important pillar of the Open Science movement, this guideline does not cover this topic. The practices described here specifically entail those for which procedures are in place and/or involve those practices which will receive more attention over the short and medium term within this institute.

Broader context of Open Science

The transition towards Open Science should be considered in a broader context. For instance, Open Science practices will need to be carefully combined with changes in ethics and privacy regulations. It needs to be acknowledged that the transition towards more Open Science is a demanding venture for both researchers and research supporters, who are already under pressure in the current academic climate.

Therefore, Open Science should also be seen in light of a cultural change toward a new and more inclusive way of working together for a collective interest. Such a cultural shift may increase the

research quality, for example by a greater emphasis on team work and collaboration with data stewards and privacy officers, and through more well-thought-out research procedures.

To achieve the necessary cultural change in academia, good and clear incentives for practicing Open Sciences are crucial. Specifically, a [new recognition and reward system](#) for both researchers and research support is required, in which research quality (over quantity), collaboration, and team work is recognized and rewarded. Recently, a new Recognition & Rewards Committee has been established within the institute to support the facilitation of and stimulate Open-Science practices and the associated incentives. A key aim of this committee is to formulate a vision on how to alleviate work pressure and create more balance in the diverse academic duties.

Becoming more open as an organization is a joint responsibility shared by all, from individual researchers (both junior and senior) to the research supporters and the board of the institute. A cultural change obviously does not happen overnight, but small steps can be made that are needed for gradual change. As Open Science is a transition in its essence and a shared responsibility, all employees at the Institute of Psychology are encouraged to provide suggestions for changes and additions to the guidelines presented in this document. Finally, all employees at the Institute are encouraged to join the [Open Science Community Leiden](#), a learning community where anyone can learn and discuss Open Science practices.

2. Tips for good research practices per research stage

Writing a grant proposal

- Ensure budget for [open access publications](#).
- Describe how you will [manage your research data](#) in order to enable reuse of your data following FAIR principles.

When submitting to the ethics committee or after having received ethics approval

- Consider [preregistration or a registered report](#).
- Include [privacy statements](#) in the consent form that enable data sharing.

Data analyses and writing up the paper

- If desirable, you can store your [data package](#) in a trustworthy repository. This repository should have a persistent identifier, e.g., [OSF](#), [Zenodo](#). Note however that it is undesirable to have duplicate packages on separate repositories. It is strongly recommend to establish a connection with the university's archiving platform [DataverseNL](#), where the final publication package needs to be stored.
- Archive the first version for submission ([preprint](#)) in a repository (e.g. OSF).

Before you submit a paper

- Does the journal policy comply with the [Transparency and Openness Promotion \(TOP\) Guidelines](#)?¹
- Is the journal compliant with your funder requirements?
- Can you find an outlet that is free of any costs?²
- Do you have to pay an [article processing charge \(APC\)](#)?
 - If so, is there funding for these costs?
 - Can you ask for a waiver?
 - In case of full open access journals, check whether it is not a [predatory journal](#) or contact the [central library](#).
- Make sure the Leiden University affiliation(s) and email addresses are correct on the proofs. Also see [authorship guidelines](#).

After acceptance of the paper

- [Upload your paper in LUCRIS](#). Use Taverne to make your paper accessible after the embargo period of 6 months if it was not published under gold open access.
- Store your [publication package](#) in DataverseNL. Make sure to link to the related publication (and vice versa).
- Update submitted [preprint](#) with the accepted version.

¹ TOP Factor is a metric that reports the steps a journal is taking to implement Open Science practices. Journals can be on the [TOP Factor website](#).

² VSNU deals and journals without APCs. See [this link](#).

3. Preregistration and registered reports

Although the Institute of Psychology does not formally require preregistration or registered reports, the institute strongly recommends these practices. Together with research supporters, the Psychology Research Ethics Committee (CEP), in collaboration with Open Science Community Leiden (OSCL), is enhancing the CEP tool to facilitate researchers in preregistering their work. A new feature will allow researchers to download a form that is suitable for preregistration on recognized platforms for this purpose, such as aspredicted.org. This form will be prefilled with relevant information from the approved ethics protocol. This new feature in the CEP tool is expected to become available early 2022.

Preregistration

[Preregistration](#) can increase the quality, transparency and credibility of research. Preregistration works particularly well for confirmatory research, for instance when clear hypotheses are formulated and/or when the goal is to replicate studies. With preregistration, a research plan of the study is specified in advance and submitted to a registry, which can include decisions about the hypothesis, methods, and/or statistical approach. Thus, this approach can make explicit which decisions were made prior to the study and which were made post hoc. Preregistration may reduce problematic research practices such as [p-hacking, publication bias, and HARKing](#), primarily through creating awareness and stimulating better plans. It is one solution to combat some of the issues that may underlie the replication crisis.

For exploratory research, preregistration could make explicit what insecurities are recognized a priori and what decisions are made post hoc. However, new initiatives such as [blinded analysis](#) may be superior to preregistration to achieve similar goals for exploratory research. Next to preregistration and blinded analyses, new initiatives like [multi-verse analysis](#), [many-analyst approaches](#), and [adversarial collaborations](#) could be considered in an inclusive approach to enhance research quality.

Currently, there are several online platforms that facilitate preregistration, such as the [Open Science Framework \(OSF\)](#) and aspredicted.org. Clinical trial registrations can be similar to preregistration, but the registered research plan may be less specific compared to preregistration. Clinical trial registration can be done on any primary registry recognized by the World Health Organization, such as the [ISRCTN Registry](#) or [Clinicaltrials.gov](https://clinicaltrials.gov). Trials that are run in the Netherlands or carried out by Dutch researchers can be registered via the [CCMO](#) (Central Committee on Research Involving Human Subjects) registry, which will soon become available (replacing the former [Netherlands Trial Register](#)).

Preregistration can also be done for research on secondary data, for example in the context of projects from a large consortium, or research using data from an external partner. A preregistration can be filed under embargo with a timestamp only to be accessed by the authors themselves so that ideas cannot be scooped. When the final product is published or under review, the preregistration can be submitted together with the paper, so that reviewers can evaluate whether or not the preregistered plan was followed. In practice, more often than not researchers have to deviate from their preregistration as they encounter unexpected analytical choices. Thus, preregistration allows

researchers to demonstrate what decisions were made prior to the study versus at a later stage in the study. Although preregistrations are not formally peer-reviewed, a careful check of the preregistration is also increasingly recognized as a valuable part of the review process.

Registered reports

Some journals also have the option to publish [registered reports](#), in which the introduction and method sections of a paper can be peer-reviewed and published before data collection. In the case of a published registered report, the full manuscript is provisionally accepted for publication if the authors follow through with the registered methods, irrespective of the research outcome. [This approach](#) has the same benefits as preregistration, but in addition it could eliminate the bias against null findings in publishing, and the authors receive thorough feedback from reviewers during the conception of the study, likely improving research methods and robustness of the outcomes. See [here](#) for journals that accept registered reports.

4. Research data management

This section describes the established research data management procedures within the institute. Over the course of 2022, a so-called data protocol will be developed in which the institute-wide data management policy will be elaborated in detail.

Established procedures: data management plan and publication packages

All researchers are encouraged to complete their data management plan using the most recent [template](#) of Leiden University. This form guides the researcher in the steps towards FAIR (Findable, Accessible, Interoperable and Reusable) data use. The institute has developed instructions and implemented procedures with regard to long-term data archiving according to the FAIR principles, and follows the [National Guideline](#) for the archiving of academic research for faculties of behavioural and social sciences in the Netherlands. All employees from the institute are expected to act in accordance with the [Netherlands Code of Conduct for Research Integrity](#) — ‘as open as possible, as closed as necessary’. The institute provides [DataverseNL](#) to archive publication packages.

All published research data and data reported in the (unpublished) chapters of a PhD dissertation are required to be uploaded to DataverseNL within one month after definitive publication of an article, and after submission to the doctorate committee, respectively. A [publication package](#) contains all the elements that can be shared and are required for reanalysis, review and replication of the published work (e.g., manuscript, stimulus materials, questionnaires, raw data, analyzed data, code, etc.). Data packages uploaded in DataverseNL are findable for others and are stored with a persistent identifier that can be used in citations. So far, each unit has assigned a data manager to review and archive data. Early 2022, these activities will be taken over by an institute-wide domain-specific data steward. Apart from DataverseNL, there are many other platforms available for data archiving and/or sharing (e.g. Zenodo, DANS Easy, OpenNeuro, Neurovault, GitHub, OSF, etc.). Researchers are free to upload their publication packages on these platforms. For instance, if they think that the use of such a platform will increase findability of their work. However, researchers are urged to consider if it is desirable to have duplicate publication packages uploaded on different platforms. If researchers wish to store their package in other repositories in addition to DataverseNL, they are strongly encouraged to make use of repositories that are trustworthy and that [enable a connection](#) with the university’s archiving platform DataverseNL, where the final publication package needs to be stored.

Research data management training

The [Centre for Digital Scholarship](#) has developed a domain-specific training focusing on research data management. All new PhD students in the institute are required to follow the [training](#) and submit a data management plan within 6 months after the start of their PhD project. Currently, these data management plans are evaluated and approved by the Research Committee of the Institute of Psychology. The template for the data management plan can be found [here](#). The data management training is offered twice a year and is also accessible for postdocs and staff. Postdocs and staff can take part in other [workshops](#) delivered by the Centre for Digital Scholarship, such as a workshop ‘How to write a DMP’.

Short and medium term plans

Early 2022, the institute-wide domain-specific data steward will take over activities related to the data management plans from the Research Committee. Additionally, the procedure will be further improved: an electronic data management plan will become available for improving, for example, the submission procedure, registration, integration with ethics and privacy applications, and possibility for amendments throughout the research project.

Privacy and the GDPR

The Institute of Psychology works closely with the Privacy Office FSW in the transition towards Open Science. Both parties will cooperate to ensure compliance with the General Data Protection Regulation, specifically by applying the frameworks of Privacy by Default and Privacy by Design. The Privacy Office's role will be to maintain the lawful, fair and transparent procedures surrounding personally identifiable information in datasets intended to be publicized. Practicing Open Science will be treated as any other data processing act for which Leiden University is the controller. Specifically, the Privacy Office will apply both the general legal framework for Open Science practices, while also providing support for specific cases and questions that may arise during these practices.

In general, GDPR is not be an obstacle for data processing acts and therefore should not hamper the transition towards Open Science. Nevertheless, researchers who have doubts or have identified potential (information) security or privacy issues may raise these with the Privacy Office at any point.

Ultimately, the Privacy Office supports the transition to Open Science as a way to raise awareness about privacy and information security issues. Open Science helps to make the acts of data processing associated with scientific publication more transparent, which is also strongly valued from a privacy perspective.

5. Open access publishing

Publishing papers in open access journals increases the visibility of the research and thereby its impact, and is nowadays a requirement by most funding organizations. In line with the [Leiden University publication policy](#), all peer-reviewed journal articles published by researchers at the Institute of Psychology must be made openly accessible in [Scholarly Publications Leiden University](#).

Routes to publishing open access

Publishing open access comes in two flavors: gold or green open access. Under gold open access, a researcher publishes a paper with a journal that facilitates full open access publication. Depending on the journal, an article processing charge (APC) needs to be paid. The other option is green open access publishing under which the author publishes their work behind a pay bar, but also uploads an earlier version in an open access repository. The central Leiden University Library offers such a repository (the Scholarly Publication Leiden University), in which case researchers upload their publication via [LUCRIS](#). Applying the [Taverne amendment](#), researchers can upload the published version under a 6-months embargo in the Scholarly Publications Leiden University, irrespective of the publisher's terms and conditions. Researchers are additionally encouraged to make papers more available by uploading papers to a preprint repository such as [PsyArXiv](#), [SocArXiv](#), [arXiv](#), or [bioRxiv](#) at the time of submission. In this case, researchers upload the same version that was submitted to the journal before peer review. A guideline with more background information on preprints can be found [here](#). Furthermore, researchers can often update this preprint with their own copy of the accepted manuscript, under conditions such as that this links to the DOI of the publisher (typesetted) version (see <https://v2.sherpa.ac.uk/romeo/>).

Note that when research is funded by external funding agencies (e.g. NWO, ERC) these agencies often already demand open access of all types of publications, including journal articles and book chapters (see [PLAN S](#)). Researchers are then required to budget costs related to publications. For advice with regard to the budgeting of such costs, researchers can consult the Centre for Digital Scholarship. The Institute of Psychology expects that all their researchers register their academic work in LUCRIS and upload the journal article in the Scholarly Publications Leiden University. The article is then immediately shown on the researcher's personal webpage, and findable by search engines such as Google Scholar.

Researchers of the Institute of Psychology are also encouraged to make conference papers, book chapters, and books openly accessible. Although practices for open access publishing for these outputs are not as common yet as for journal articles, open access publishing for academic and professional articles and chapters is supported under [Taverne](#). Monographs are not supported under Taverne. Examples on how to make books open access can be found [here](#).

Article processing charge (APC), funding, 'good practice' journals, and predatory journals

There are two models for journals: hybrid and full open access. Hybrid journals publish standard behind a paywall, as users have to pay for access to content. However, these journals provide the option for an open content license (for example a [creative commons license](#)) and make reuse possible. In that case, they charge an APC, a payment that a journal charges to cover the publication process. Full open access journals do not publish behind a paywall. The APCs of hybrid and full open access journals vary, but can be up to €9500 for a journal such as Nature. As such, the transition to

open access publishing can be a costly endeavor, at the advantage of publishing companies. However, the [UNL](#) (former VSNU) has negotiated several deals with publishing companies, making open access publishing available in more than 11.000 of (hybrid) journals at reduced or no APCs. Information on the deals, journals, terms and conditions can be found [here](#). Browse the Journal Browser for the possibilities to publish open access listed per journal. If you only wish to see the journals that will allow you to publish without having to pay, you should use the filter in the menu on the left-hand side of the [Journal Browser](#).

The Institute of Psychology does not impose a maximum on APC payments. APC payments from research projects that are externally funded require permission from the principal investigator of those projects. For externally funded projects, these payments can be (partly) covered by the fund as these costs must be taken into account in the budget when submitting a proposal. APC payments from the basic funding (*eerste geldstroom*) require permission from the chair of the researcher's unit and depend on the budget of the unit. Please make sure you have permission before submission.

Researchers are strongly recommended to think ahead about publication costs and to make agreements with collaborators about who covers the APC and other additional charges for pages and color illustrations. For instance, the agreement could be that APC is covered by the first and/or last author of the publication. Or if an article is co-authored with other institutions, researchers could collectively decide that each institution is expected to pay its fair share of the APC.

In choosing their outlet, authors should be careful of predatory journals: full open access journals that hold low standards against high profit margins. Make use of [Think, Check, Submit](#) to identify trusted journals and publishers for your work. Researchers can reach out to the Centre for Digital Scholarship for help with choosing trusted outlets. The institute encourages publishing in journals that are owned by the scholarly community (e.g., through scholarly societies), that are non-profit and adopt responsible publishing practices. Researchers are recommended to publish in journals that comply with the [Transparency and Openness Promotion \(TOP\) Guidelines](#). [TOP Factor](#) is a metric that reports the steps a journal is taking to implement open science practices. For questions related to open access publishing, researchers can contact the [Centre for Digital Scholarship](#) for advice and training.