

Editorial

Considering Registered Reports at *C&RL*

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In January 2020, I presented at the Librarians Building Momentum for Reproducibility virtual conference.¹ The theme of the presentation was preregistration and registered reports and their role in reproducibility of research results. The presentation was twofold in that it provided background information on these themes and then advocated for the adoption of a registered reports submission track in Library and Information Science journals. I asked attendees to notify me if they wanted to learn more and to join me in contacting LIS journals to advocate for this model. The first journal that we targeted was *College & Research Libraries*. We drafted a letter that was sent to editor Wendi Arant Kaspar who discussed the topic with the editorial board and ultimately asked me to write a guest editorial for *C&RL*.²

In this editorial, I will attempt to convey the value of registered reports, how it is consistent with *C&RL* priorities (e.g., promoting transparency in the research process), and how it could be implemented at *C&RL* logistically.

Registered reports enable research methods to be peer-reviewed before data collection. In practice, this means that a study's methods and analysis plan are submitted to a journal prior to beginning data collection. The registered report is then peer reviewed, and if accepted, the authors are given a provisional guarantee that the study will be published regardless of positive, null, or negative findings. As explained by the Center for Open Science:

*This format is designed to reward best practices in adhering to the hypothetico-deductive model of the scientific method. It eliminates a variety of questionable research practices [QRPs], including low statistical power, selective reporting of results, and publication bias, while allowing complete flexibility to report serendipitous findings.*³

When a registered report meets journal expectations, authors are given a conditional acceptance (also known as in-principle acceptance) and assured that the journal will publish the completed study if they indeed adhere to the registered methods.

Registered reports are considered one method for preventing questionable research practices (QRPs), which are practices that "can spuriously increase the likelihood of finding evidence in support of a hypothesis."⁴ Fidler and Wilcox describe QRPs as practices that "inflate the rate of false positives in the literature."⁵ The high prevalence of QRPs is considered a cause of the replication crisis, and as explained by Dorothy Bishop, "more journals are adopting the

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‘registered report’ format, in which editors evaluate the experimental question and study design before results are collected—a strategy that thwarts publication bias, P-hacking and HARKing” which are explained in more detail below.⁶ Registered reports improve efforts for distinguishing between confirmatory and exploratory research. Four examples of QRPs are listed below with more context.

Bias Against the Null/Publication Bias happens when studies produce null or negative findings, and instead of publishing, authors self-select to not submit this research to journals. This is also known as the ‘file-drawer problem’ or file-drawer effect in which researchers put studies with nonsignificant results in their file drawers.⁷ Likewise, publication bias could occur when/if journals choose not to publish null or negative findings. With bias against the null, there is a risk of only the potentially false “by chance” research being published.

Hypothesizing After Results are Known (HARK) is when authors present a *post hoc* hypothesis as though it were an *a priori* hypothesis.

p-hacking is performing multiple analyses in order to find patterns in the data that present as statistically significant (typically a p-value ≤ 0.05) even though the studies may not have been originally designed to look at those variable relationships. Additionally, p-hacking could include selective reporting of statistically significant observations.

Underpowered Studies are studies conducted with low statistical power which may lead to erroneous conclusions, false positives, or false negatives.

When conducting experiments in the social sciences and other disciplines, there are researcher degrees of freedom and flexibility in both conducting the studies and analyzing the results. For example, HARKing and/or p-hacking could be used to convey that a study produced statistically significant results consistent with study predictions when in reality, methods and analyses were unplanned, unpredicted and/or cherrypicked. Bias against the null could be allowing false positive studies to flourish in the scholarly literature, while underpowered studies could create a “crisis of confidence” in influencing false-positive findings as well as inflated effect sizes.⁸ Further, meta-analyses, an evidence synthesis method trending in the social sciences, exposes that p-hacking and publication bias distort the cumulative evidence, and Friese and Frankenbach advise that journals, funders, and institutions prioritize the prevention of QRPs to ensure trustworthy evidence.⁹ Another concern with meta-analyses, when including studies hindered by QRPs, they have a “garbage in, garbage out” problem in which meta-analyses are vulnerable to p-hacking and publication bias and therefore the outcomes could be a distorted view of the evidence base.

When a journal commits to helping to realign incentives and moves to adopt a registered reports submission track option, this does not eliminate the opportunity for exploratory research submissions. The exploratory research can co-exist with registered confirmatory research. Transparently differentiating between registered studies and unregistered studies helps make this distinction and could be appropriately interpreted by librarians and other practitioners working to make evidence-based decisions. Registered reports are not limited to quantitative research methods or original data collection. Guidance exists for ways in which research methods and analysis plans could be registered for qualitative research as well as methods analyzing secondary data.¹⁰ Librarians who already support systematic reviews and meta-analyses likely already have experience with preregistered methods for secondary data analysis.¹¹

C&RL has a reputation for being a premier venue for LIS scholarship, and with a commitment to a gold open access publishing model, scholars and practitioners have equitable access

to the fulltext versions of manuscripts. Additionally, *C&RL* has recently made a commitment to authorship transparency in adopting portions of the CRediT taxonomy with a scheduled rollout for 2021.¹² Adding a registered reports submission track would help ensure that *C&RL* maintains these high standards but with a heightened awareness toward research methods. As previously stated, registered reports are considered one avenue for thwarting publication bias, p-hacking, and hypothesizing after results are known. The existing *C&RL* guidance for reviewers already includes two points that speak to the ethos of a registered reports submission track: 1) Is the method used appropriate to the subject? 2) Does the evidence presented support the hypothesis?¹³

In addition to helping prevent QRPs, *C&RL*'s TOP (Transparency and Openness Promotion) Factor would be positively affected. Under the TOP Factor heading of Publication Bias, level 3 represents the journal's acceptance of registered reports as a submission option.¹⁴ Announced on May 5, 2020, Web of Science will be adding TOP Factors to their Master Journal List making the TOP Factor more discoverable for scholars seeking journals to submit their work.¹⁵

In terms of communicating a registered reports option to ACRL members and other potential *C&RL* authors, a new submission option could be clearly articulated in the author instructions as has been done with many of the 266 other journals already incorporating registered reports.¹⁶ Helping matters, librarians who have long supported systematic reviews as a consultant or co-author are likely already familiar with the registered reports model since it is used by both *Cochrane Reviews* and *Campbell Systematic Reviews*. Additionally, in at least one *C&RL* article, authors noted that their study was preregistered—“Same question, different world: Replicating an Open Access Research Impact Study,” from Arendt et al. where the research question and study methods were preregistered in the Open Science Framework Registry.¹⁷ Had *C&RL* already adopted the registered reports submission track, this is one example of a study that could have been peer reviewed prior to data collection.

Broadly, journal editors have expressed concerns over implementation and specifically, the technical procedures needed amidst antiquated journal submission websites. Luckily, there are resources available via the Center for Open Science to help *C&RL* proactively ensure the process is as non-disruptive as possible for editors, reviewers, and authors.¹⁸ In terms of changes to the peer review workflow, the Center for Open Science has outlined a process and uses the language Stage 1 and Stage 2. Stage 1 represents the intended hypothesis and methods and Stage 2 represents the post-study write-up. In anticipation for what the technical implementation in Open Journal Systems (OJS)/Public Knowledge Project would entail, there are already existing models in which OJS journals have enabled registered reports. One example is *Biolinguistics*. The cited resource provides detailed logistical information regarding how submitted manuscripts are triaged for both Stage 1 and Stage 2.¹⁹ A summary is below.

Stage 1:

Study introduction, methods, anticipated timeline, data sharing intentions, analysis plan, and registration plan for an approved repository (e.g., Open Science Framework Registry).

Reviewer role at this stage is to review:

- research question importance
- hypothesis/es rationale
- rigor and feasibility of methods

Stage 2:

Study is complete, and the manuscript is ready for review.

Reviewer role at this stage is to review:

- whether the Stage 1 submitted rationale and hypothesis/es matches the Stage 2
- whether the data collection tested the proposed hypothesis/es
- whether the Stage 1 submitted methods were precisely followed
- if anything new is presented in either the methods or analysis plan that was not introduced in Stage 1. If yes, the authors need to justify this choice and explain that it was methodologically sound
- whether the conclusions appropriately reflect the findings/results

In conclusion, I, along with the original letter signers, hope that *C&RL* will seriously consider this call for a registered reports submission track. This change would help strengthen the literature published in *C&RL* and advance the practice of replicable and reproducible research in librarianship. Previous *C&RL* articles have focused on academic librarian support of reproducible research, and this shift to permitting registered reports in an LIS journal would be aligned with this work as well as taking a step forward to look inwards at our own research practices.²⁰

Chris Chambers, Professor of Cognitive Neuroscience, author of the *Seven Deadly Sins of Psychology: A Manifesto for Reforming the Culture of Scientific Practice*, and outspoken advocate for registered reports, highlighted ten reasons why journals should offer registered reports in an article in the journal *Addiction*.²¹ In this article, he did not mince words when advocating for registered reports; he wrote, “The duty now falls on journals, and journal editors, to help provide solutions. Registered Reports is one such solution and there is no reason for any credible journal in a field suffering from QRPs not to offer the format at the earliest opportunity.”²² Now we are asking *C&RL* to do the same.

Notes

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