
PERSPECTIVE/OPINION

Micropublishing During and After the COVID-19 Era

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In the COVID-19 situation, social and behavioral science evidence is accumulating rapidly through online data collection, but the options to share and publish this information are scarce. As a remedy, I recommend the adoption of micropublishing in the fields of social and behavioral sciences. While micropublishing has been gaining popularity, it is not yet widely accepted or utilized by existing academic journals. Greater implementation would improve the availability of data in the immediate COVID-19 era and establish a post-COVID-19 publishing methodology that could increase researcher and practitioner engagement in real time. I recommend micropublishing in a specific manner that bifurcates an experiment's methodology or survey method from the subsequently published data based on that experiment protocol. Published findings could be presented in a series and edited as new data emerges. This publishing system promotes cumulative science. To provide a visual example that supports my argument, I created a demo journal with sample papers organized according to the structure I recommend. The demo journal has features—except a Digital Object Identifier (DOI)—that make it possible to publish social and behavioral sciences research. It could be replicated for a newly established journal. Alternatively, existing journals could add a section dedicated to micropublication.

Keywords: covid-19; open science; publishing; questionable research practices; reproducibility

The fast and wide spread of the coronavirus disease (COVID-19) is a major threat to humankind. People from all walks of life are exposed to infection. To cope with this pandemic, the World Health Organization and other health organizations have recommended social distancing. Consequently, governments and autonomous organizations have set restrictions on people's movement and employment. Researchers and academics are dealing with similar limitations. Particularly for the social and behavioral sciences, in which some of the research requires interaction with human subjects, it may not be possible to conduct further research or to access laboratories. These impediments imply that considerable social and behavioral research is shrinking globally.

In response, research methods are shifting to online experiments and surveys. For example, several large psychological multi-lab collaborations, such as the COVIDiSTRESS project (<https://covidistress.github.io/>) or the Psychological Science Accelerator's COVID-Rapid project (<https://psysciacc.org/>), are considering implementing online questionnaires. Although various limitations have to be taken into consideration (for example, prolonged experiments result in a substantial number of dropouts; Sasaki & Yamada, 2019), online experiments and surveys enable researchers to collect diverse and comprehensive

data in a short period of time (Grootswagers, 2020). Therefore, some social and behavioral researchers, who are currently unable to conduct laboratory experiments, have been able to continue to collect data.

However, publishing limitations persist. While the number of manuscripts uploaded as preprints is growing, the bottleneck of outlets has resulted in many being left unpublished. Some publishers and printers are offering expedited publishing options for medical journals (Beeby, 2020). For example, some journals associated with social behavioral studies are willing to publish COVID-19-related research through fast peer reviews (e.g., Chambers, 2020; "Science in the time of COVID-19," 2020), and others have waived publication fees (e.g., Frontiers, 2020). At the same time, it is evident that there will only be a limited number of papers published through these emergency methods. *Psychology of COVID-19 Preprint Tracker* indicates that there are a very large number of COVID-19 preprints in psychology that are awaiting publication (Syed, 2020).

In this article, I focus on "micropublishing," which is a publishing method that specializes in the accumulation of data with minimal text. It is not yet popular among social and behavioral scientists. I argue that introducing micropublishing to these fields will remedy the lack of publishing options available during the immediate COVID-19 crisis and will establish a paradigm-shifting publishing method that could be used even after this pandemic is addressed.

Micropublishing

Academic publishing has changed drastically in the last few decades. Many features of the publication process are not traditionally associated with final publication, that is, open access, open material/data, preprint, pre-registration, and post-publication peer review. In this context, micropublishing of academic papers has emerged. Micropublishing is a term originally coined by independent (mostly private) publishers that print niche and shorter material and publish on-demand for target markets. This method is agile. There has been a movement to take advantage of this and use it for academic publishing. The launch of *microPublication Biology* (<https://www.micropublication.org/>) is emblematic of this trend. *microPublication Biology* offers fast and flexible publication with minimal text (only description¹ and method; minimal or no introduction and discussion), rapid peer review, rapid publication (within one week),² and direct registration of findings to genomic databases (for example, WormBase³). The contents of the paper can be any generic novelty-oriented research, replication experiments, experiments with negative results, proposals, or even methodology. This publication format itself could be disseminated across many academic disciplines as an academic micropublication (I will simply refer to it as “micropublication” hereafter). **Table 1** shows a short summary of the characteristics of micropublication and other formats. In some respects, micropublication is a middle ground between preprints and journal full papers. Registrability refers to whether pre-registration is possible, and there is non-refereed pre-registration available in each of the three formats. This is to be expected since authors only need to use a third-party registration site before submission. If authors desire peer review for pre-registration, they currently have the option of registered reports, which is a method for conducting experiments after the protocol has been accepted by peer review and finally reporting it as a full paper. In micropublications, the pre-registration protocol is peer-reviewed and published as a paper when it is accepted. This could be a new option in the pre-registration system, and it will be discussed in more detail later.

Social and behavioral research can also adopt this format. The introduction of pre-registration (and Registered Reports) and open data in these fields is progressing rapidly (e.g., Nosek, Ebersole, DeHaven, & Mellor, 2018; van 't Veer & Giner-Sorolla, 2016). Publishing direct replication reports of previous experiments has also become popular as famous mega-replication papers have been published in *Science* (Open Science Collaboration, 2015). Similarly, information in social and behavioral sciences, as well as

opinion papers, such as this one, are micropublishable. For empirical studies, a reader does not need a detailed introduction but can concentrate on examining the methods and results. Similarly, reviewers can focus on methods and results for their peer review. Micropublication journals are peer reviewed with equally high quality and standards as other journals, but the manuscript is written in a minimalistic form, so reviews inevitably take less time for completion.

To demonstrate this, I have created a micropublication journal in psychology, my area of expertise, entitled “*Psychological Micro Reports*” (<https://sites.google.com/view/pmr-journal/>). I have published sample papers as well as fact-based experimental data. This demo journal does not have a Digital Object Identifier (DOI) but has all the components of a psychology journal. For example, the journal employs fast-tracking peer review all year round, and accepted manuscripts are published (released) immediately.

Micropublishing to accumulate evidence

With the COVID-19 situation, social and behavioral sciences evidence is accumulating rapidly through online data collection, but the options to share this information are scarce. Micropublishing would make evidence available quickly. This publication method will be imperative to revitalize academic debate around the COVID-19 situation. An overview of uploaded preprints of COVID-19-related psychological research indicates that there are many overlapping research themes. For example, several studies have been conducted regarding risk perception (Gerhold, 2020; Niepel, Kranz, Borgonovi, & Greiff, 2020; Raude, Debin, Souty, Guerrisi, Turbelin, Falchi, ... Colizza, 2020; Wise, Zbozinek, Michelini, Hagan, & mobbs 2020; Zettler, Schild, Lilleholt, & Böhm, 2020), anxiety (Šrol, Mikušková, & Cavojova, 2020; Tabri, Hollingshead, & Wohl, 2020; Zheng, Yao, & Narayanan, 2020), controllability (Everett, Colombatto, Chituc, Brady, & Crockett, 2020; Li, Yang, Dou, & Cheung, 2020; Li, Yang, Dou, Wang, Zhang, & Lin, 2020; Šrol et al., 2020), stress and coping (Gerhold, 2020; Sweeny, Rankin, Cheng, Hou, Long, Meng, ... Zhang, 2020), and others that fall into the COVID-19-related research categories recently exemplified by Van Bavel, Baicker, Boggio, Capraro, Cichocka, Cikara et al. (2020). Distributed and overlapping findings should be aggregated in a series. In this current environment, it is desirable to micropublish the first proposal paper that describes an experiment's methodology or survey method and then publish data based on that protocol in a series of subsequent papers. The deviations, if any, can be noted. Furthermore, as is clear in my demo journal instructions,

Table 1: Characteristics among some publication formats.

	Preprint	Micropublication	Journal full paper
Structure	Complete IMRAD or Protocol	Description and Method	Complete IMRAD
Peer review	No	Fast	Slow
Registrability	Pre-registration	Pre-registration	Pre-registration and Registered report

constraints on generality and other limitations should be mentioned in the text. The disclosure of these deviations and limitations should never require too much space and should not detract from the brevity of the micropublication, because the experiments and data in micropublications are simpler than those in full papers, and there cannot be too many things to disclose.

Fast publishing implies inaccurate and sloppy research, but this publishing system promotes cumulative science. In other words, one paper may not have a strong value on its own, but the combination of multiple papers may be stronger. In addition, since publications are open for editing in micropublication journals, problems of individual papers can easily be corrected.

Future benefits of micropublishing

After the COVID-19 crisis is over, will micropublishing survive? Micropublishing offers many advantages in open science. It leads to flexible paper types (it breaks through the traditional format restrictions for original articles, short reports, and reviews) and opens the possibilities for publishing trivial or null results; this change mitigates publication biases (Mahoney, 1977). In addition, this system has the potential to develop Registered Reports. According to the Center for Open Science, Registered Reports are defined as “peer review before results are known to align scientific values and practices” (<https://cos.io/rr/>). Registered Reports are now being published in more than 240 journals and are expected to become an important norm for open and reproducible science by suppressing *p*-hacking (Simmons, Nelson, & Simonsohn, 2011) and HARKing (“hypothesizing after the results are known” coined by Kerr, 1998). In *p*-hacking and HARKing, the hypothesis and the experimental protocol have to be peer reviewed before the experiment (Stage 1) and no changes are allowed thereafter. Then, the results of the experiment and the interpretations are added and the manuscript is peer-reviewed again (Stage 2). Finally, both stages are compiled as a single paper. This system can prevent a variety of questionable research practices (QRPs) by limiting the degree of freedom the researcher has to establish hypotheses and analyze methods after the experiment is complete.

In this case, how does micropublishing implement Registered Reports? Take the example of my demo journal. The e0001 paper only describes the method of the experiment. This is the same as the Stage 1 protocol for Registered Reports. The e0002 paper, on the other hand, is based on the results. This is the same as the Stage 2 for articles. In other words, Stages 1 and 2 are one study, but separate micro papers: the final form of the registered reports should not be necessarily just one paper. Moreover, the authors of each micro paper can be different. I have proposed a division of labor between the pre-registration and experimental groups in Registered Reports (Ikeda, Xu, Fuji, Zhu, & Yamada, 2019; Yamada, 2018). This format of micropublication is an easy way to implement this recommendation. The division of labor makes the QRPs meaningless as the experiment performers and the hypothesis builders are different. It also allows each

researcher to focus on their research strengths, changing the status quo whereby only research experts can become published researchers (Yamada, 2019).

Limitations

The promotion of micropublication has three major concerns. The first stems from a science communication perspective. In recent years, scholarly information sharing in preprints has flourished, but such preprints have not been peer-reviewed. Nevertheless, there are cases where strong arguments are made on the basis of preprints. For example, making misplaced preprint-based policy recommendations in relation to COVID-19 caused considerable confusion, and possibly resulted in some lives being lost; many such papers related to COVID-19 were retracted in a short period of time, as Retraction Watch reported (<https://retractionwatch.com/retracted-coronavirus-covid-19-papers/>). A vitally important paper released during the COVID-19 pandemic points out that psychology does not have the capacity to advocate for COVID-19 and needs to start with an evidence level classification (IJzerman et al., 2020). The current paper is proposed based on the idea that micropublication ensures the quality of the evidence while achieving fast publication, and I believe that the format can be applied to the reproducibility problem in psychology as it is. Unlike preprints, micropublications are peer-reviewed. However, neither micropublications nor preprints should be used to make policy recommendations, and they should be distinguished from journal full papers. More generally speaking, strong arguments based on the publication of a single paper should be avoided.

The second concern relates to researcher evaluation. Researchers can quickly enrich their CVs by continuing to only micropublish because of the process's rapidity and brevity. It will thus be necessary to, at the very least, make micropublications clear in CVs so they can be identified (this is also recommended by *microPublication Biology*). However, this will only be understood by evaluators who understand micropublication. In fact, this issue is connected to structural reforms on researcher evaluation. Recently, many have questioned whether researchers should be evaluated based on impact factors. However, no new measures have emerged at a level that can be realistically adopted. In recent years, a service called Plaudit (<https://plaudit.pub/>) has provided a system for determining the reputations of researchers, guaranteed by ORCID, for each article. If this becomes widespread, journal-based assessments such as impact factors will gradually fade away, and the number of micropublications will become irrelevant in the evaluation of researchers.

It should be noted that post-publication peer review may be important in any case. The high time-pressure for micropublication peer reviews can lead to a cursory checking, resulting in a flood of terrible publications. However, as I mentioned earlier, micropublication reviewers will not be distracted by superfluous sections (typical introduction and discussion sections) and can focus on and examine the key points (methods, analysis, etc.). Further, elsewhere, I am discussing a new post-publication

peer review model in which open peer review comments on already-published articles are published in journals with a DOI (Ikeda, Yamada, & Takahashi, 2020). We are proposing this publishing model for general journals, but when we combine this with the idea of micropublication journals, very interesting things can happen. That is, a post-publication peer review comment can also be a micropublication paper. This chain of micropublications will be the hallmark of future accumulation and self-correcting science.

A final concern is the trade-off between brevity and theory. In other words, the minimization of the introduction and discussion, as described above, dilutes the description of the relationship between the background theory and experiment in the paper. This is a virtually unavoidable problem, but any experiment that requires so much careful introduction and discussion that it cannot be micropublished should be submitted to journals as a full paper. Micropublication is just one option other than full papers. Every paper should be written in its proper format, and the feature of micropublication is that it deliberately minimizes the theoretical aspects, which should be fine as long as the researcher correctly understands this point.

Conclusion

I recommend that micropublishing be adopted in the fields of social and behavioral sciences, because it would bring numerous benefits during and after the COVID-19 era. It is not necessary to launch a new micropublication journal (as I have with the demonstration of *Psychological Micro Reports*). Instead, existing journals could introduce a policy to accept such papers. The journal *Molecular Brain* has an article-type similar to micropublication, known as the Micro Report (<https://molecularbrain.biomedcentral.com/submission-guidelines/preparing-your-manuscript/micro-report>). Therefore, the Micro Report model could be replicated and implemented instantly. The spread of COVID-19 has dramatically changed research practices. It is imperative that journals adapt accordingly.

Notes

- ¹ The “description” is a micropublication-specific term that simply introduces experiments with a description of the results.
- ² One of the reviewers kindly informed me of the following concern. The micropublication tends to accelerate the frequency of publication, which in some cases may result in an overwhelming quantity of papers being produced. For example, we can imagine the current state of preprint servers as a similar phenomenon. This may lead to reduced accessibility of each paper and a lower signal-to-noise ratio for the required literature information. Therefore, micropublication journals will have to implement an easy-to-use search or filtering system. We need to take advantage of tags, and we should have a state-of-the-art recommendation and curation system in place.
- ³ One of the reviewers kindly informed me that there is a large-scale, micropublication-like example in genomic databases, although it is not peer-reviewed. Benjamin

Neale's Lab (<http://www.nealelab.is/uk-biobank>) releases very large-scale GWAS data (4203 phenotypes, 361194 individuals) using UK Biobank, but there is only a minimal description of the methods and results for each result set. In addition, a similar effort exists for brain imaging GWAS data (<https://open.win.ox.ac.uk/ukbiobank/big40/>). In view of this situation, I expect that the demand for micropublications will continue to increase in the future.

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Competing Interests

The author has no competing interests to declare. The author YY is an Associate Editor at Collabra: Psychology and was not involved in the review process of this article.

Author Contributions

Drafted and/or revised the article, Approved the submitted version for publication: YY.

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Peer review comments

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