The Cooperative Revolution is Making Psychological Science Better: An Open Letter to
Producers and Consumers of Psychological Science

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correspondence and feedback regarding this letter to the first author, Chris Chartier
(cchartie@ashland.edu), by 3/21/2018.

The cooperative revolution is making psychological science better

Psychology is currently experiencing [something of a revolution](#), and it is a cooperative one. The cooperative revolution comes in response to psychology's so-called "replication crisis", a period of self-reflection that revealed [problematic flexibility in data analysis](#), [publication bias](#) (null findings are less likely to be submitted and/or published than positive findings), and [disappointingly low replicability rates](#)—challenges that are also playing out [across disciplines](#), ranging from cancer biology to neuroscience.

But change is coming. In the past decade, psychologists are more frequently and openly communicating with each other, initiating world-wide projects involving the collaboration of dozens of researchers, and pushing academic journals and professional organizations to rapidly adopt practices to increase the rigor and transparency of published work. Thanks to the internet, graduate students and researchers from less privileged institutions share the same platforms as their more privileged peers; information about new research, methods, and statistics are routinely discussed by scholars from all over the globe; and geographical distance is less of a barrier to collaboration than at any point in history.

In short, this is an exciting time to be in the field of psychology. We are encouraged by the hope and passion for our science that we currently see in our colleagues, and we believe this cooperative revolution will push our science to become more collegial, rigorous, progressive, and inclusive.

Criticism, cooperation, and collaboration

Our optimism should not be confused with naivety. We acknowledge that the debates surrounding methodological reforms have been accompanied by clear cases of incivility, both in public (e.g., calling other researchers names on social media) and in private (e.g., threatening a colleague's career over email). We would like to stress the importance of fostering a scientific discourse that can be both strongly critical and also civil. Incivility is by no means necessary to get a critical point across, and if anything, only distracts from the message. Importantly, psychologists are now [having conversations](#) about how to establish new norms for critical debates that occur in increasingly public spaces like blog posts and social media.

Science benefits when critique is not made personal and not taken personally—but scientists are closely associated with their findings, and having your work criticized is undeniably hard. We all experience this—for example, when reading critical reviews on a manuscript or grant proposal. But being wrong is a basic part of being a scientist. And for science to be self-correcting, [we need to embrace critique of our work](#). If someone points out errors in our work, we need to take a deep breath and objectively evaluate if we may be wrong. Paraphrasing [James Heathers](#): science

is not about producing *research*, but about producing *knowledge*, and for that we need to be deeply critical of our own work and that of others.

But embracing a spirit of strong criticism is not sufficient for good science. We need an environment of cooperation and collaboration. And, in our opinion, the past decade has been largely cooperative and positive, with the vast majority of reform-minded researchers operating in a tactful and professional manner. They are providing a valuable service to both producers and consumers of science, and are driven by a heartfelt desire to improve their field and its reputation among the public. Here, we highlight a select few efforts (many of which we are personally involved in) of supportive communities, civil conversations, statistical innovations, collaborative teaching materials, diverse and inclusive lab cultures, large-scale research collaborations, and technological infrastructure to support it all.

Supportive communities and constructive conversations

Social media and other online platforms have provided researchers with new ways to connect with other scholars, share and debate ideas, and learn from each other. Conversations occur in real-time instead of unfolding in slow-motion in the pages of printed journals. They can also be structured in ways that encourage people from all career stages to participate instead of only a limited number of eminent insiders.

A good example of constructive, online conversation is the Facebook discussion group [PsychMAP](#). PsychMAP provides a space for researchers to engage in constructive, open-minded, and nuanced conversations about psychological methods and practices. The group has thousands of members from around the world, from undergraduate students to senior professors.

Discussions range from critical-yet-civil debates about scientific priorities or the strength of a given literature, to specific questions about the best way to analyze a particular kind of data. The group is lightly moderated by four scholars who very occasionally step in to steer conversations away from focusing on specific individuals and toward asking broader questions about methods and practices. A Community Board of scholars from a diversity of research areas, career stages, and institution types has helped the group develop the breadth and inclusivity of both the topics discussed and the range of people who contribute to discussions. Spaces like PsychMAP have created opportunities for faster, more broadly accessible, and more inclusive scientific discourse.

We also see the spirit of cooperation, constructive discussion, and concrete progress in the [Society for the Improvement of Psychological Science](#) (SIPS). SIPS is a new academic organization aimed at bringing scholars together to improve methods and practices in psychological science. SIPS has now held two meetings, at which there are no pre-scheduled lectures, but a mixture of hands-on workshops and “hackathons,” geared toward learning a new skill or solving a concrete problem, and lightning talks and unconference sessions to pitch and discuss new ideas. Several of the projects we mention in this letter were initially brainstormed at

SIPS meetings. One surprising feature of this conference is that not only are the majority of attendees pre-tenure academics (including a large number of graduate students), but there is also significant representation from teaching focused colleges and other schools outside the well-funded and high-profile R1 universities.

One quick way to hear what participation in (and reflection on) these open science movements can actually sound like is to listen in on the excellent conversations on podcasts like the [Black Goat](#) (hosted by Simine Vazire, Alexa Tullett, and Sanjay Srivastava), [Everything Hertz](#) (James Heathers and Daniel Quintana) and [Circle of Willis](#) (Jim Coan and weekly guests). These podcasts engage with subjects like improving research practices, scientific communication, interprofessional dialogue, and personal growth. Notably, these podcasts are often informed by audience questions. Black Goat discussions, for instance, are frequently informed by listener feedback and questions gathered from Facebook, Twitter, and emails.

New statistical tools and technological infrastructure

The cooperative revolution has also benefited from exciting statistical innovations. Scientists are designing new tools to provide straightforward solutions to some of the problems related to the replicability crisis. For instance, it turned out that roughly half of the published psychology articles contain inconsistencies in reported [means](#) or [statistical test results](#). Although these errors can easily arise through honest mistakes (for instance, copy-paste errors), they can distort substantive conclusions. To facilitate detecting such errors, free programs and apps such as [GRIM](#), [statcheck](#), and [p-checker](#) have been developed. Researchers can easily use these tools to quickly screen their manuscripts for errors before they submit them to a journal.

Researchers and funders have also invested heavily in the infrastructure supporting our increasingly collaborative science, developing online platforms to archive and share our data and research materials (e.g., [Databrary](#), the [Open Science Framework](#)) and platforms devoted to archiving the cumulative evidence for the empirical effects underlying our theories (e.g., [Curate Science](#)). These resources create a flexible ecosystem of tools that researchers can use to speed up their current workflows and more easily adopt new practices. Many of the projects we discuss have both used and contributed to this research infrastructure to implement practices like preregistration, to meet specific research needs (e.g. [PsyArxiv](#), [OSF for Meetings](#)), and to ease the burden of coordinating very large research teams. The value of tools like these—both during these projects and after the research is complete—cannot be overstated.

Collaborations

Perhaps the most visible hallmark of the cooperative revolution has been the dramatic increase in large-scale collaborations across many areas of psychological science (e.g., [ManyLabs](#), [ManyBabies](#), the [Psychological Science Accelerator](#), [Registered Replication Reports](#), and [StudySwap](#)). Traditionally, most basic research in psychology has been conducted by a single lab

at one university, which creates necessary limits on the scope of the projects a researcher can take on—especially for topic areas that involve studying specific hard-to-recruit participant groups (i.e. young children, bilinguals, people with specific clinical diagnoses, etc.) rather than convenience samples (e.g., college students participating in studies for course credit). Large-scale collaborations create new opportunities for conducting highly powered studies and testing moderators even in resource-intensive topic areas.

For example, by pooling the effort of over 50 labs, the [ManyBabies](#) project is beginning to build large datasets that both validate important findings in developmental psychology and provide a context in which to debate how we can best collect and analyze these data. By the middle of 2018, ManyBabies will have conducted the largest lab-based study of infant cognition that we are aware of to date: a study on infants' attention to child directed speech ("baby talk") with over 1,500 young participants.

Similarly, although psychology has often been criticized for [focusing too heavily](#) on the United States and other western countries, the newly launched [Psychological Science Accelerator](#) is a globally distributed network of psychological science laboratories (currently 210), representing 45 countries on all six populated continents, that will collect data for democratically selected studies. The [network's mission](#) is to "accelerate the accumulation of reliable and generalizable evidence in psychological science, reducing the distance between truth about human behavior and mental processes and our current understanding." The Accelerator is committed to five core principles that reflect the ethos of the cooperative revolution quite well: (1) diversity and inclusion with respect to researchers and participants; (2) decentralized authority; (3) transparency, by requiring and supporting practices such as pre-registration, open data, analytic code, and materials; (4) rigor, both in the standards for approving individual studies and the process of managing the unique challenges of multi-site collaborations; and (5) openness to criticism, by inviting and carefully considering all critical feedback.

Open and inclusive teaching and training:

The spirit of cooperative material sharing has extended to how we teach the next generation of scientists. Psychologists have worked together to generate [excellent reading lists](#) on methods reforms and reproducibility, which they then share freely with others to use in both graduate and undergraduate courses. Some have even taken the extremely cooperative step of posting [complete syllabi](#) and [course materials](#) to be amended and adopted by any instructor who finds value in bringing those materials into their classroom.

Platforms like Twitter make space for new kinds of discussions, which—because they are so public—can have strikingly fast impacts on the culture of psychological research. One example is the question of how undergraduate students become involved in research labs, a critical type of experience for applying to graduate school in the sciences. A relatively large and diverse group

of scientists ([link](#)) has been discussing the importance of offering paid research opportunities instead of purely voluntary positions. Pro bono research work is simply not realistic for students who need summer income to pay their way through school and systematically excludes some students from getting research experience at a critical point in their careers. Anecdotally, we have noticed a promising uptick in advertisements for paid summer internships in some excellent labs in psychological science.

In a similar way, Twitter and Facebook have provided forums for discussion about codes of conduct (see the [code of conduct for SIPS attendees here](#)), which have been common in software development and related fields for several years. As part of the much longer conversation in academia of how to address the many members of our community who have experienced sexual harassment or assault, professional conferences in psychology have begun to adopt these codes of conduct as a way to clarify the norms of behavior we expect from our colleagues and to respond to people who violate these expectations.

Moving forward: A call to action

Psychology's revolution is well underway and is gaining momentum. Though considerable progress has already been made, there is still much work to be done. But we cannot do it alone. Whether you are a student just getting his hands dirty in lab work, an early career researcher carving out her scholarly niche, or a well-seasoned professor with decades of experience, we hope that you will join us in our pursuit of research integrity, transparency, and rigor.

Most researchers chose the profession for the same basic reasons: to gain knowledge about the world; to make a difference; to advance and improve society. These goals remain a shared feature of our work, regardless of the area of inquiry.

As we move forward, we are calling on all researchers (ourselves included) to continuously improve the rigor of their work. As researchers, we owe it to the scientific community and to society to produce the best research possible. This includes making our data available, thoughtfully engaging with criticism when it arises, and admitting when mistakes have been made—behaviors that reflect the scientific ideals of verifiability, organized skepticism, and fallibilism. We are all fallible and we all make mistakes. The revolution is our attempt to identify these mistakes more quickly, to advance a cumulative science through cooperation and collaboration, and to grow as researchers and as a field.

Chris, Melissa, Randy, Michèle, Dan, & Alison