Research Transparency and Reproducibility Training (RT2)

2017 Report

September 20-22, 2017
London, England

OVERVIEW

The Berkeley Initiative for Transparency in the Social Sciences (BITSS), an initiative of the Center for Effective Global Action (CEGA), held its first international Research Transparency and Reproducibility Training (RT2) at International Workplace in London, England on September 20-22, 2017. This RT2 event was the fifth three-day training organized by BITSS since 2014. The event was sponsored by the Laura and John Arnold Foundation, the John Templeton Foundation, and the William and Flora Hewlett Foundation.

Through this training, participants learned about the theoretical and practical aspects of the credibility crisis and were introduced to a number of tools and methods to implement transparency and reproducibility in their own workflows.[1] In particular, the training provided an overview of concepts including pre-registration and pre-analysis plans, replication, reproducible literature reviews, data management and de-identification processes, transparent reporting, and meta-analysis. They were also given the opportunity for hands-on practice with version control using GitHub, dynamic documents, and study registration using the Open Science Framework (OSF). Finally, participants were introduced to a number of cutting-edge open science tools during a series of lightning talks on Jupyter, JASP, and Preprints, concluding the final day with a timely discussion of the debate surrounding significant levels and the strength of evidence.

RT2 London also provided ample opportunities for networking and collaboration in addition to serving as platform for BITSS to identify and advise capable leaders for the Catalyst Program.

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[1] All training materials are available online at: https://osf.io/cdfh7/

Participant Profile

BITSS received 65 applications from individuals from 21 different disciplines and sub-disciplines, including economics (28.1%), governance (15.6%), psychology (14%), and political science (7.8%). More than half of the applicants (53.1%) were PhD students, while 14% were faculty, 9.3% were researchers, 7.8% were post-docs, and 6.2% were master's students.

Out of the 65 applicants, 36 participants–18 women and 18 men–were selected and invited to attend RT2. The cohort included 13 PhD students, 10 post-doctoral scholars or research practitioners, 7 university faculty, 3 Master's students, and 1 researcher manager. Participants came from a wide array of academic disciplines, including 30.5% from economics, 13.9 % from political science, 16.7% from psychology, 5.6% from biostatistics, 22.2% from other social sciences, and 11.1% from other disciplines. 34 of these selected participants were able to attend (see Figure 1 below for attendees' disciplines and positions).

In addition to ensuring gender balance among participants, BITSS focused on improving gender balance among faculty, with 6 (43%) out of 14 female faculty members. Though this is an improvement from past years', BITSS will continue to strive for diversity and inclusion in both its faculty and participant selection processes in planning for future RT2 events.
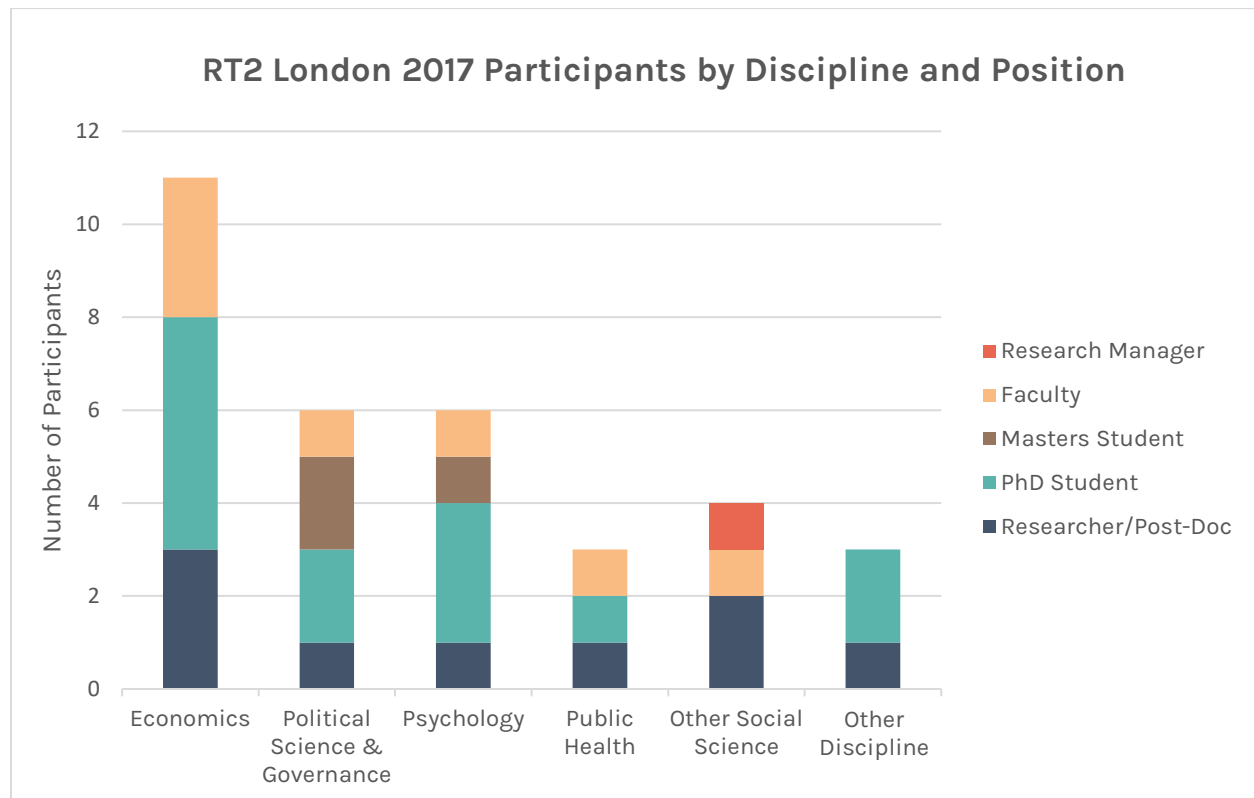

Figure 1: Distribution of BITSS 2017 RT2 London participants by discipline and position.

Feedback and Lessons Learned

An evaluation survey was administered to participants after each day of RT2 to assess the usefulness, pace, and instructor preparedness for each session. Participants could provide additional feedback through a comments section in these daily surveys and during the final wrap-up session of the event. The following is a summary of the key findings from these responses.

The three-day training consisted of 16 sessions. On a scale of 1-5 (5 being the most useful and 1 being least useful), participants rated overall curriculum at 4.71 (see Table 1 below), an increase from the last RT2 event in Berkeley that had an average ranting of 4.64. In terms of faculty quality, RT2 participants provided an overall rating of 4.57, a slight decrease in comparison to the RT2 Berkeley 2017 faculty rating of 4.68. However, on average, participants expressed strong confidence in terms of the training's contribution to their understanding of fundamental problems in social science research (4.59) as well as their understanding of best practices in research transparency and reproducibility (4.68).

| *How would you rate RT2 in terms of:*	**Average Score (RT2 Berkeley 2017)**	**Average Score (RT2 London 2017)**
Overall curriculum quality?	4.64	**4.71**
Overall faculty quality?	4.68	**4.57**
Improving your overall knowledge on the problems facing social science research transparency and reproducibility?	4.55	**4.59**
Improving your overall knowledge on research transparency and reproducibility best practices?	4.68	**4.68**

Table 1: Comparison of participants rates between the two 2017 RT2 events in Berkeley and London.

BITSS developed and distributed a Participant Manual to all participants and faculty before RT2 London. The manual included a brief overview of topics to be covered at the training, a suggested reading list, a list of actions to take before the training (e.g., software installation, OSF account registration), a final agenda, and lists of RT2 Faculty and Participants. Most participants reported that they reviewed the manual before Day 1 and gave it an average rating of 4.13 in terms of improving their knowledge of research transparency and reproducibility. A few participants suggested including materials on R for those who may want to switch from using Stata to R during the Dynamic Documents sessions.

Sessions were rated 4.41 on average, with the highest rated individual sessions being Power and the Strength of Evidence (4.86), Lightning Talks (4.68), Reproducible Literature Reviews (4.67), and Replication (4.6).

At the beginning of Day 1, participants were introduced to a 'roadmap' (see Figure 2), which provided a systematic overview of the flow of the three days. The agenda was structured to mirror the steps in a researcher's workflow. Faculty began their presentations with a reference to this roadmap to show how all the sessions fit together and reflected on their perspective or "lens," based on their discipline and research focus. Based on the feedback from daily surveys,
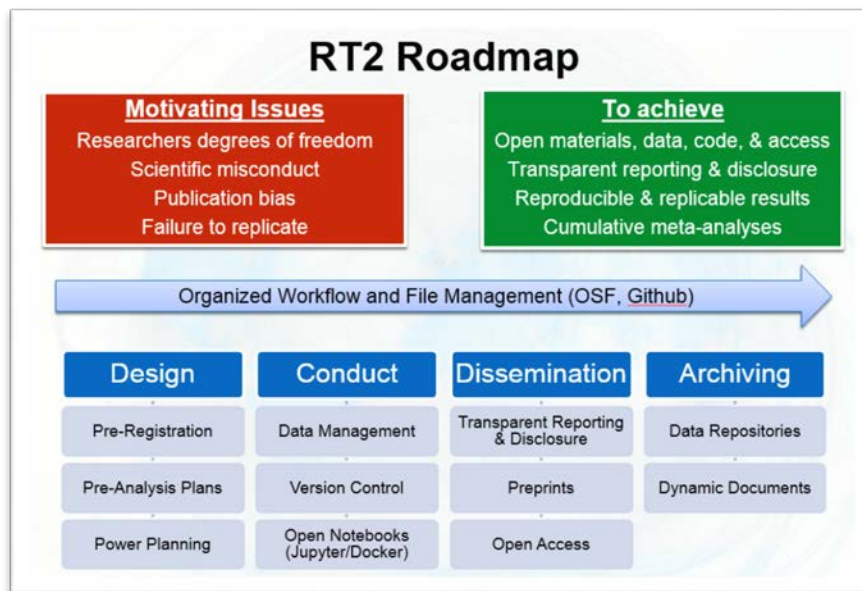
participants believed the roadmap helped by adding clarity and improving the flow of the agenda.

Figure 2: RT2 Roadmap for integrating research transparency and reproducibility in the workflow

Day 3 of the training provided participants with hands-on experience with version control using GitHub and the Command Line, and dynamic documents using Stata and R. Most of the surveyed participants were able to install the required software before the session (88% for GitHub and 95% for Stata/R) and 91% signed up for an OSF account. Participants appreciated the exposure to and hands-on experience with these tools, with the session on version control receiving an average rating of 4.41 and dynamic documents receiving an average rating of 4.

To improve the experience for the software sessions, multiple participants recommended i) allocating more time and ii) having an introductory training to allow them to familiarize themselves with the software before engaging more deeply with it during the training. They also expressed a preference for focusing on one of the two software options in the Dynamic Documents session (R or Stata) by splitting into two groups. In addition, participants reported problems with the venue's wireless internet connection and recommended adding separate sessions exclusively dedicated to practicing the use of the software tools.

Participants welcomed the opportunity to learn about other new tools presented during the Lightning Talks. In written feedback, participants expressed their willingness to further

explore how to integrate JASP and Jupyter into their workflows. Moreover, the presentation about BITSS Preprints drew a lively discussion with participants expressing interest in learning more or uploading their own paper to a preprints service.

Long-Term Impact and Considerations for Future RT2 events

RT2 received overwhelmingly positive feedback regarding the curriculum, quality of faculty, and event logistics. Participants expressed confidence in their grasp of the challenges in research transparency and reproducibility and welcomed the new methods and tools presented during the training.

One important consideration for future RT2 events concerns the challenge of ensuring that the content and discussions during the training are inclusive and relevant for all participants, given the diverse audience. In general, participants appreciated the opportunity to hear presenters from different academic backgrounds, as they brought in their own perspectives and insights to each topic. One stated that this made it "easier to re-engage with each session over a long day."[2] Still, some participants recognized the challenge of differences in terminology across disciplines and suggested starting RT2 with a review of methods and approaches or distributing a glossary of terms. One participant also suggested using live polling platforms such as polleverewhere.com to promptly assess participants' understanding of topics and enable participants to anonymously report examples of misconduct from their own experience. BITSS has also seen an increase in the number of qualitative and mixed methods researchers at RT2 trainings. Some of these participants pointed out the challenge of translating the curriculum in a way that is applicable to their work, suggesting the need for additional or modified sessions.

All sessions seemed to be relatively well-paced and participants actively took part in the discussions. A participant suggested using an online course before the conference to introduce basic concepts and ensure that participants are familiar with software in advance. During the wrap-up session, many participants confessed they were not immediately confident in their ability to pass on all of their new technical knowledge to their colleagues or students, and that more time spent in experiential learning could potentially address this challenge.

BITSS was excited to hear many of the participants express a readiness to implement research transparency tools and standards in their own workflows and help share best practices at their home institutions through the [BITSS Catalyst Program](#). In addition to expressing a desire to keep in touch with BITSS and other RT2 participants, a number of participants discussed interest in holding trainings at their own institutions. In the future, BITSS could facilitate more opportunities to socialize, connect, and develop potential collaborations throughout the training.

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[2] Quote from daily participant feedback forms, RT2 London 2017.

BITSS is delighted to have had such an enthusiastic cohort of participants who were eager not only to improve the transparency and reproducibility of their own work, but also to pass on what they learned to their colleagues, peers, students, and communities. The diversity of participants' disciplines, levels of experience, and roles in the research process helped drive insightful discussions.

As we continue to keep in touch and evaluate the results from our forthcoming post-training surveys, we hope that participants apply the concepts and tools they learned and continue to develop their skills in performing transparent and reproducible research. We thank all those who attended for their participation and for being a part of the open science movement!

Thank you!