



Let's Get SSMART: New Grant Program funds “Research on Research”

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BERKELEY – The Berkeley Initiative for Transparency in Social Science (BITSS) is pleased to announce the winners of a new grant program exploring the reliability, reproducibility, and validity of policy-relevant research.

Ten teams of researchers were selected to receive awards of up to \$30,000 each as part of the new *Social Science Meta-Analysis and Research Transparency (SSMART)* grant program. SSMART, funded in part by the Laura and John Arnold Foundation, aims to increase the quality of research in economics, political science, psychology, and related disciplines.

The selected projects fall within three categories: (1) developing innovative methods to improve the transparency and credibility of research findings; (2) developing new tools and approaches for meta-analysis; and (3) studies of researcher norms and strategies to promote the practice of open science.

For this inaugural competition, 39 proposals were received, requesting more than \$1 million in funding (see Figure 1). The SSMART review committee—including experts in economics, political science, and psychology¹—selected proposals representing a mix of disciplines and focus areas.

Figure 1. Funding requests for SSMART grants, by discipline

Discipline	Funding requested	%
Computer Science	\$59,865	5.5%
Political Science	\$137,745	12.6%
Other	\$146,708	13.4%
Public Health	\$179,559	16.4%
Economics	\$257,240	23.4%
Psychology	\$316,210	28.8%
TOTAL	\$1,097,327	100.0%

Synopses of the awards are below. Research projects are expected to be completed by December 2016 and progress can be tracked on the Open Science Framework (OSF). BITSS is an initiative of the Center for Effective Global Action (CEGA), headquartered at University of California, Berkeley. For more information, visit <http://bitss.org>.

¹ The review committee included Ted Miguel (UC Berkeley, Economics); Neil Malhotra (Stanford, Political Science); Garret Christensen (UC Berkeley, BITSS); Courtney Soderberg (Center for Open Science); Jennifer Sturdy (UC Berkeley, BITSS); Gautam Rao (Harvard, Economics); Kevin Esterling (UC Riverside, Political Science); Leif Nelson (UC Berkeley, Psychology) – *recused from final selection*. Reviewers were split into 4 groups, each containing an external reviewer plus one BITSS staff or faculty member. A fifth group was formed to review a proposal submitted by one of the external committee members, to ensure fair review. Each group reviewed 4-9 proposals, with assignments based on discipline and category (to maximize reviewers' expertise).

Category 1: Developing innovative methods to improve the credibility of research findings

Reporting Guidance for Trial Protocols of Social Science Interventions

Researcher(s): Sean Grant (RAND Corporation)

Open Science Framework Page: <https://osf.io/uv4hs>

Abstract: Protocols improve reproducibility and accessibility of social science research. Given deficiencies in trial protocol quality, the SPIRIT Statement provides an evidence-based set of items to describe in protocols of clinical trials on biomedical interventions. However, such reporting guidance does not exist for trial protocols of social science interventions. This project will involve an online Delphi process to adapt and modify items of the SPIRIT Statement for guidance on reporting protocols of social science intervention trials. This Delphi process will identify consensus from a diverse panel of experts on items to include in guidance for trial protocol content for social science interventions—leading to the development of a useful tool for increasing the transparency of trial protocols and registries.

Optimal Use of Spatial Information in Crowd-Sourced Meta-Analysis of Understudied Populations

Researcher(s): James Rising (UC Berkeley), Solomon Hsiang (UC Berkeley)

Open Science Framework Page: <https://osf.io/u3czt/>

Abstract: We propose to develop a novel technique, “spatial meta-analysis,” that optimally estimates meta-analytic results for populations in a specific location, even in cases where the population is never sampled. Heuristically, this approach “interpolates” statistical findings across space, in addition to accounting for observable characteristics of populations. We propose to implement a proof-of-concept for this approach in our novel platform for crowd-sourcing meta-analysis, the Distributed Meta-Analysis System (DMAS). DMAS leverages the internet for assembling and disseminating meta-analysis in any research field. As a test case, we will construct a crowd-sourced spatial meta-analysis for studies of the relationship between climate and social conflict.

Power calculations and clustering: New techniques for transparent social science research

Researcher(s): Catherine Wolfram (UC Berkeley), Fiona Burlig (UC Berkeley), Louis Preonas (UC Berkeley), Matt Woerman (UC Berkeley)

Open Science Framework Page: <https://osf.io/cnpjk/>

Abstract: We propose to develop power calculation methods that will improve inference in empirical social science research. Many power calculations are based on existing formulas and canned packages. These methods are designed for independent and identically distributed errors, contrary to the modern practice of clustering standard errors to allow for arbitrary dependence among groups of observations. Moreover, even when researchers employ simulation-based power calculation methods accounting only for one-way correlated error structures, when using panel datasets, these assumptions are likely incorrect. We propose deriving analytic results to fully characterize these problems, investigating the extent to which they matter in the literature, and creating open-source statistical packages to allow researchers to easily perform cluster-robust power calculations and ex post analyses.

Category 2: Developing new tools and approaches for meta-analysis

Examining the Reproducibility of Meta-Analyses in Psychology

Researcher(s): Daniel Lakens (Eindhoven University of Technology), et al.

Open Science Framework Page: <https://osf.io/q23ye/>

Abstract: Recent concerns about the reliability of single studies might also apply to meta-analyses, where the selection, inclusion, and coding of studies introduces substantial flexibility in the analysis and interpretation of results. It is essential that meta-analyses can easily be reproduced to allow researchers to evaluate the impact of subjective choices on meta-analytic effect sizes, but also to update meta-analyses as new data comes in, or as novel statistical techniques are developed. We plan to quantify the reproducibility of meta-analyses in psychology by reproducing twenty published meta-analyses. We will examine how much variability in effect size estimates is observed in reproduced meta-analyses, both as a function of subjective choices, as when novel statistical techniques to correct for bias are applied to published meta-analyses.

A Meta-Analysis of Distributional Treatment Effects in the Microcredit Literature

Researcher(s): Rachael Meager (Massachusetts Institute of Technology)

Open Science Framework Page: <https://osf.io/qse8j/>

Abstract: This study will develop new methodology for meta-analyses of distributional treatment effects in order to produce a new meta-analysis of microcredit interventions. Bayesian hierarchical models provide the framework for aggregation of quantile treatment effects and variance treatment effects, allowing for heterogeneous effects across studies while also estimating a generalized effect. I will also develop accompanying metrics of external validity, by extending the existing Bayesian pooling metrics to assess the heterogeneity in distributional effects across sites. The resulting analysis should reveal the full distributional impact of microcredit access, and thus inform future policy decisions regarding microfinance institutions.

Using P-Curve to Assess Evidentiary Value of Social Psychology Publications

Researcher(s): Leif Nelson (UC Berkeley)

Open Science Framework Page: <https://osf.io/ngdka/>

Abstract: The proposed project will utilize p-curve, a new meta-analytic tool to assess the evidentiary value of studies from social psychology and behavioral marketing. P-curves differs from meta-analytic methods by analyzing the distribution of p-values to determine the likelihood that a study provides evidence for the existence of an effect; in the event that there is not evidentiary value in a study, p-curve can also determine whether a study is powered such that it would detect an effect 33% of the time, given it exists. We will apply p-curve to each empirical paper in the first issue of 2014 in three top-tier journals: Psychological Science, The Journal of Personality and Social Psychology, and The Journal of Consumer Research. Additionally, we will conduct a direct replication of one study from each of these issues.

External Validity in U.S. Education Research

Researcher(s): Sean Tanner

Open Science Framework Page: <https://osf.io/qep7f/>

Abstract: This study will assess the external validity of U.S. education research through a meta-analysis of results from thousands of education studies clustered within 562 interventions. By analyzing studies clustered within interventions, this research will describe how well a single study's results are predicted by additional studies of the same

intervention in addition to analyzing how well study samples match the target populations of interventions. The results of this study will provide a comprehensive description of external validity in recent U.S. education research, while also suggesting features of research on which the scientific community and funding agencies should focus.

Getting it Right with Meta-Analysis: Correcting Effect Sizes for Publication Bias in Meta-Analyses from Psychology and Medicine

Researcher(s): Robbie C.M. van Aert (Tilburg University)

Open Science Framework Page: <https://osf.io/9jqht/>

Abstract: The intended project will first create a large-scale dataset consisting of primary study results as reported in many published meta-analyses from psychology and medicine. Second, the severity of publication bias and its inflating effects on effect size estimation will be systematically studied by using the newly developed p-uniform method, because p-uniform has better statistical properties than existing methods for assessing publication bias. Meta-regression procedures will be included to study whether inflation of effect size due to publication bias differs between psychology and medicine, and whether less precise studies are accompanied with more extreme effect size estimates (i.e., small-study effects).

Category 3: Studies of researcher norms and strategies to promote open science

Open Science in Development Engineering: A New Model for Replication

Researcher(s): Paul Gertler (UC Berkeley)

Open Science Framework Page: <https://osf.io/576xj/>

Abstract: Replication is a common safeguard against publishing bias and the distorted body evidence it can create. Yet, there is no systematic and commonly adopted approach within academic publishing to conducting replications in a robust, verifiable and transparent way. Also lacking is a positive incentive structure that rewards rigor over fishing exercises, in which a replicator is motivated to identify errors above all else. The journal of Development Engineering, a new open access, interdisciplinary journal launching in Fall 2015, intends to pilot a new model of open science publishing in response to these challenges. The journal editors will select accepted, pre-published manuscripts at random for replication. The journal will assess the effectiveness of this replication model with observational data collection and comparison with existing replication approaches.

How often should we believe positive results?

Researcher(s): Eva Vivalt (Australian National University), Aidan Coville (World Bank)

Open Science Framework Page: <https://osf.io/g8dwy/>

Abstract: High false positive and false negative reporting probabilities (FPRP and FNRP) reduce the veracity of the available research in a particular field, undermining the value of evidence to inform policy. However, we rarely have good estimates of false positive and false negative rates since both the prior and study power are required for their calculation, and these are not typically available or directly knowable without making ad hoc assumptions. We will leverage on AidGrade's dataset of 647 impact evaluations in development economics and complement this by gathering estimates of priors and reasonable minimum detectable effects of various intervention-outcome combinations from policymakers, development practitioners and researchers in order to generate estimates of the FPRP and FNRP rates in development economics.