



Student Government

UNIVERSITY OF COLORADO **BOULDER**

University of Colorado Student Government Legislative Council

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84 LCR 06 Transparent Research Policy

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A Resolution to Develop and Adopt a Policy on Transparent Research Practices

Resolution History

CU-Boulder is regarded as an international leader in scientific research. In addition to the academic departments and the nearly 90 research centers, CU-Boulder houses 11 research institutes, which account for more than half of the university's sponsored research dollars and are supported by more than 900 researchers, students, and staff.¹ According to the Flagship 2030 Strategic Plan, CU-Boulder strives to enhance the international model of the flagship university by "setting new standards in education, research, scholarship, and creative work," and in developing this strategic plan, the focus was primarily on our role as a *research* university.

It is a priority at CU-Boulder to engage with the international scientific community and to promote leading standards in scientific research. CUSG and the United Government of Graduate Students (UGGS) are members of the Right to Research Coalition,² the University Libraries is a member of the Scholarly Publishing and Academic Resources Coalition (SPARC),

¹ <http://www.colorado.edu/research/research-institutes>

² <http://www.righttoresearch.org>

³ and CU-Boulder is a member of the Coalition of Open Access Policy Institutions.⁴ Through communities like these, CU has joined international initiatives aimed to improve the quality of the scientific research model. For example, CU-Boulder has recently joined international efforts to disseminate scholarly work to the communities who support it (e.g., tuition-paying students; tax-paying citizens) by launching its own Open Access repository (CU Scholar)⁵ and by adopting a campus-wide Open Access policy⁶ that grants CU-Boulder nonexclusive license to the scholarly work of its faculty, including published journal articles and conference proceedings.

Recently, the scientific community has put a lot of energy and resources into estimating how accurate and reliable scientific findings really are. One way to do this is to conduct a previously published study and see if the findings replicate. Although the topic of replication (or reproducibility) has been discussed among scientists for decades, it is now receiving a great deal of attention and for good reason. Research on anticancer drugs sparked much of this concern when more and more researchers started reporting how the majority of drugs shown to be effective in preclinical studies somehow lose their effectiveness when later tested and so are never eventually implemented by physicians.⁷ To examine this, a team of researchers attempted to replicate 53 "landmark" studies and were only able to confirm the results of 11% of them.⁸ In the studies that replicated, the original authors had paid close attention to controls and the potential influence of experimenter bias. In their published reports, they included the complete dataset, including all variables, conditions, and cases. In the studies that did not replicate, on the other hand, data were not analyzed by researchers blind to the study's hypotheses, complete datasets were rarely reported, and original authors often admitted to only reporting data and analyses that confirmed their hypotheses. A similar large-scale replication attempt was reported by a team at Bayer HealthCare who reported that only 25% of published preclinical trials could be replicated.⁹ So to be clear, the overwhelming majority of these preclinical findings appear to not be valid or reliable, and a major issue that contributed to this problem was that published reports were biased in that they tended to only report findings that confirmed the researchers' hypotheses.

This issues pervades several other areas of research as well. A team of researchers attempted to replicate 100 psychology findings that were published in 2008, and only 35 could be replicated.¹⁰ In another large-scale replication attempt, 24 independent labs attempted to each replicate a single, well-known, psychological finding, and only two were able to do so.¹¹ Several researchers have attributed this lack of reproducibility to a lack of research transparency (e.g., only reporting findings that confirm the hypothesis)¹², and several others

³ <http://sparcopen.org>

⁴ <http://sparcopen.org/people/coapi/>

⁵ <http://scholar.colorado.edu>

⁶ <http://scholar.colorado.edu/openaccess.html>

⁷ <http://www.nature.com/nrclinonc/journal/v8/n4/full/nrclinonc.2011.34.html>

⁸ <http://www.nature.com/nature/journal/v483/n7391/full/483531a.html>

⁹ <http://www.nature.com/nrd/journal/v10/n9/full/nrd3439-c1.html>

¹⁰ <http://science.sciencemag.org/content/349/6251/aac4716>

¹¹

http://www.slate.com/articles/health_and_science/cover_story/2016/03/ego_depletion_an_influential_theory_in_psychology_may_have_just_been_debunked.html

¹² <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4115664/>

have shown just how easy it is to analyze any dataset to confirm nearly any hypothesis¹³ with certain practices that are quite common in scientific research.¹⁴ Some have even gone so far to suggest that “most published research findings are false.”¹⁵

Many researchers are referring to this state of science as a “replication crisis” because irreproducibility is harmful. It leads researchers down a rabbit hole of false findings who are otherwise trying to further an area of research, it decreases public confidence in science,^{16,17} and it places a huge financial burden on the communities that support that research (e.g., tuition-paying students; tax-paying citizens). For example, it is estimated that the United States spends \$28.2 billion annually on preclinical research that is irreproducible¹⁸ (i.e., likely not valid).

However, several other researchers are referring to this time in history as a revolution and a sort of “uprising focused on how we should be doing science now” and that this is the time to finally improve some of our research practices because of changing technology and changing demographics of researchers.¹⁹ A wide range of interventions have been proposed aimed to address the reproducibility issues, and one set of proposals in particular has gained a lot of momentum. The Transparency and Openness Promotion Guidelines (TOP Guidelines)²⁰ recommend eight standards aimed at moving science toward transparency, openness, and reducing irreproducibility. They include rewarding scientists for engaging in transparent practices, practices that make replication attempts easier, and practices known to increase confidence that research findings are reliable. For example, when studies are pre-registered, researchers must declare their research plan (e.g., procedure; data analysis plan) prior to collecting any data. This prevents researchers from searching for the particular analysis that confirms their hypothesis after the study is completed or just hiding the study in a file drawer if they do not like the results. Pre-registration was implemented as a policy in 2000 for all research funded by the National Heart Lung, and Blood Institute (NHLBI). Prior to 2000, 57% of the published studies reported that the drugs or dietary supplements included in the study were effective at improving cardiovascular health. However, since studies were required to pre-register, only 8% of published findings showed a drug or supplement to be effective.²¹

The scientific community is beginning to adopt research transparency standards such as the TOP Guidelines. Some scientific journals now promote and reward transparent practices²² and some are even mandating them such as requiring the dataset to be published along with the manuscript (e.g., Public Library of Science²³; Proceedings of the Royal Society B: Biological Sciences²⁴). Some university organizations have been established to promote research transparency and educate its scientific community (e.g., Berkeley Initiative for

¹³ <http://pss.sagepub.com/content/early/2011/10/17/0956797611417632>

¹⁴ <http://pss.sagepub.com/content/early/2012/04/16/0956797611430953.abstract>

¹⁵ <http://journals.plos.org/plosmedicine/article?id=10.1371/journal.pmed.0020124>

¹⁶ <http://nypost.com/2012/04/02/faith-in-science/>

¹⁷ <http://www.ncbi.nlm.nih.gov/pubmed/21668088>

¹⁸ <http://journals.plos.org/plosbiology/article?id=10.1371/journal.pbio.1002165>

¹⁹ <http://m.pps.sagepub.com/content/10/6/886.full>

²⁰ <https://cos.io/top/>

²¹ <http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0132382>

²² http://www.psychologicalscience.org/index.php/publications/journals/psychological_science/badges

²³ <http://journals.plos.org/plosone/s/data-availability>

²⁴ <https://royalsociety.org/journals/ethics-policies/data-sharing-mining/>

Transparency in the Social Sciences²⁵) and a few university libraries have endorsed transparent practices (e.g., Carnegie Mellon University²⁶). However, no university to date has established a campus-wide policy regarding research transparency.

It is clear that the scientific community is struggling with reproducibility issues and that scientific organizations are becoming aware of these issues and working to improve research transparency standards. Now is the time for CU-Boulder to again establish itself as a world class research institution by leading this movement at the university level and by establishing a university transparent research model for other universities to follow. A policy such as this would enhance the quality of research at CU-Boulder and increase public confidence in the findings of that research. Also, adopting a transparent research policy at a university has the added benefits of providing the community (e.g., tuition-paying students, tax-paying citizens) with more access to the research they support, and it makes for more efficient use of university resources.

Resolution Summary

This resolution seeks to address policy gaps that exist at CU-Boulder regarding the use of transparent and open research practices. Specifically, this resolution urges the administration to establish a working group comprised of administrators, faculty, and students to develop a campus-wide transparent research policy that would require all university research to (1) report all findings that were originally included and originally considered to be relevant for the research, (2) report the results of all studies conducted at CU-Boulder, not just those published in academic journals, and (3) publish datasets in open-access repositories.

Whereas, CU-Boulder is a world class university with a heavy emphasis on research as outlined in the Flagship 2030 Strategic plan;

Whereas, the typical way in which scientific research is conducted and published leads to a high false-positive rate and irreproducibility;

Whereas, the lack of reproducibility in scientific research is receiving widespread international attention;

Whereas, transparent research practices, such as the TOP Guidelines, are becoming the norm among leading research organizations who strive to improve reproducibility and enhance confidence in research findings.

THEREFORE, BE IT RESOLVED by the Legislative Council of the University of Colorado Boulder Student Government, THAT:

²⁵ <http://www.bitss.org/>

²⁶ <http://www.library.cmu.edu/datapub/sc/opencmu/cmu-position-statements>

Section 1: CUSG calls upon CU-Boulder to implement a campus-wide transparent research policy that would require the following practices to be adopted in all university-supported research:

- A. Report all variables, code, and results that were originally included and originally considered to be relevant for the research.
- B. Report the results of all studies conducted at CU-Boulder, not just those published in academic journals.
- C. Publish datasets in publicly-available repositories.

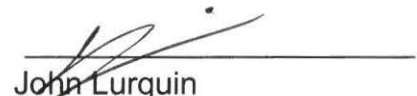
Section 2: CUSG encourages the administration to establish a working group comprised of administrators, faculty, and students to develop this campus-wide policy and provide recommendations for any necessary infrastructure.

Section 3: The resolution shall take effect upon final passage in Legislative Council and upon either obtaining the signature of two Tri-Executives and the Legislative Council President or the lapse of six days without action by the Tri-Executives.


4/21/16	Vote Count:	
4/28/16	1 st reading	Acclamation
	2 nd reading	Approved



Nicolas Trevino
Legislative Council President



John Lurquin
President of Student Affairs



Boneth Ahaneku
President of Internal Affairs



Joseph Soto
President of External Affairs

