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Reply to Liberman and López Olmedo's "Psychological Meaning of 'Coauthorship' Among Scientists"

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The concepts of co-authorship and research collaborations seems both straightforward and at the same time very complicated. Several studies have emphasized that co-authorship practices differ depending on the research field, and this needs to be taking into consideration when examining research communication, collaboration and productivity. The study by Sofia Liberman and Roberto López Olmedo (2017) is a great contribution to the examination and discussion of these concepts. I will discuss their study based on my knowledge from the fields of scientometrics and sociology of science.

### **Measuring Co-Authorship**

The first thing to note is that the authors state that there are different approaches in how scientific studies measures co-authorship, however, without referring to such studies. The co-authorship studies that have come to my attention measure co-authorship through the list of authors named in of byline of the same publication this creates a quantitative measurable link or bond between these researchers. Therefore, the measuring of co-authorship is straightforward.

The problem arises when research collaboration comes into measurement, since scientific studies use different ways of measuring research collaboration. Liberman and López Olmedo point out how “*different types of collaborations entails different types of relationships between researchers (...)*.” Hence, it is problematic to equate co-authorship and research collaboration. Earlier bibliometric studies had a tendency to use co-authorship and research collaboration as synonymous concepts, and some studies still do. The common argument for using co-authorship as a proxy for research collaboration is that it is the best available indicator for quantitative studies of research collaboration, and co-authorship is a reflection of some kind of collaboration.

Hence, co-authorship is what links the researchers together by the publication in the formal or the “outer cycle” of science communication system. Researchers become authors through this link and establish themselves in both the science communication and reward system. The scientific norms in these systems assume that it is possible to identify and assign the individual intellectual responsibility of a piece of scientific work (Biagioli and Galison 2003). The tendency to co-author publications and the general rise in the average number of authors makes it more complicated to identify the individual contribution and necessary to discuss the concept of co-authorship. Not to mention, how this should incorporate into an examination and discussion of how different epistemic cultures affect researchers’ practices of co-authorship.

Liberman and López Olmedo’s study brings interesting aspects about how scientists conceptualize co-authorship, but it is not surprising that research collaboration and teamwork are among the most used words to define co-authorship for all fields, except for chemistry. If one examines co-authorship studies, it will probably be the same words appearing as definer words of such studies. However, the remaining definer words confirm

many suggestions from previous studies (e.g. Corley and Sabharwal 2010, Lee and Bozeman 2005). Not to mention, that many of these words correspond to the Mertonian norms of science (Merton 1973), and focuses on how the collaboration and co-authoring improves the research. For example *Sharing ideas and work*, *Richer ideas*, and *Ideas enrichment* all focus on the synergy that collaboration adds to the research process. The words *Learning* and *Knowledge* fit the idea that collaborations occur because of needs for experts and educating junior researchers.

## A Broader Scope

At the same time, one could question why the researchers use the word *Active Participation*, since in an ideal world one would expect all collaborators to be actively involved in the research process. Could this be an indication of problems with gift or career authorship? On the other hand, is it just a way of being inclusive, so all who contributed to the research project should be included as co-authors? It could be interesting to go deeper into the meaning of these words and discuss how they reflect certain research cultures. Similarly, the words *More publications and productivity* corresponds to the often-mentioned problems with publication pressure, where researchers need to spread their work in multiple projects to ensure no zero publishing periods.

The results of Liberman and López Olmedo study would benefit from a greater discussion and references to science communication and sociology of science studies, especially of the included research fields; physics, mathematics, biological sciences and chemistry. For example, multiple studies have concluded that the extent of research collaboration differs across subject fields, thus it affects the researchers' perception and practices of co-authorship. Birnholtz (2006) interviewed researchers from CERN and found that in high-energy physics the practices of co-authorship do not correspond to the traditional model of authorship. The authorship it-self was a reward for working on a common project, and some admitted they have not even read the articles they were co-authoring.

Lariviere et al. (2016) examined the authorship contribution statements for PLOS ONE articles, and found differences in co-authors' contributions depending on their field and rank. Physics has an egalitarian view on authorship, so they give all the authors credit for all kinds of contributions, while biomedicine and clinical medicine have a greater division of labor, and have a greater focus on the individuals reward. Chemistry is moderate, where execution and analysis of technical and experimental work, like life sciences, is highly associated with authorship, but often in association with another type of task (writing, designing experiment etc.). Mathematics is a vastly theoretical field with fewer authors on the research articles, which reflects the contribution statements giving equal credit and responsibility for all parts of the research article. The authorship and science cultures studies correspond very well with the results from the Liberman and López Olmedo study, and they enhance the validity of their study.

I was surprised about the results of the study by Liberman and Galán Díaz (2005) of the concept of international collaboration, where the findings show that researchers did not mention co-authorship as a main concept. Therefore, I checked their study and found that international publications were among the main concepts, and I might be over-interpreting, but the link from international collaboration to international publication is co-authorship.

Thus, co-authorship is definitely among the mentioned concepts, and in association with the main concepts. Therefore, I think it could be interesting to repeat a similar study using the stimulus word *collaboration* to explore how researchers conceptualize research collaboration and whether they immediately think of co-authorship. This study would also reveal to what extent there are variability between the definer words for co-authorship, international collaboration and collaboration, as well as between different research fields. There would be a great possibility to do a comparative study based on the collected interview and survey data of these concepts and explore to what extent these concepts semantically overlap.

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