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Effects of publications in proceedings on the measure of the core size of coauthors

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HIGHLIGHTS

- Work on a recent publication by Ausloos [1] on the core of coauthors is discussed.
- Three cases of statistical physicists are examined. Time effect is examined in one case.
- Their publication list is broken into proceedings or peer review papers.
- Subcores of coauthors are found and their values discussed.
- This may suggest team funding criteria or criteria on career evolution.

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ABSTRACT

Coauthors (CA) of a "lead investigator" (LI) can receive a rank (r) according to their "importance" in having published joint publications with the LI. It is commonly accepted, without any proof, that publications in peer review journals and for example conference proceedings do not have the same "value" in a CV, and the same applies to papers contributing to encyclopedia and book chapters. It is examined here whether the relationship between the number (J) of publications of some scientist with her/his coauthors, ranked according to their decreasing importance, i.e. $J \propto 1/r^{\alpha}$, as found by Ausloos (2013) [1], still holds if the overall publication list is broken into such specific types of publications. Several authors, with different careers, but mainly having worked in the field of statistical mechanics, are studied here to sort out answers to the questions. The exponent α turns out to be weakly scientist dependent, only if the maximum value of J and r is large and is $\sim +1$ then. The m_A core value, i.e. the core number of CAs, for proceedings only is about half of the total one, i.e. when all publications are counted. Contributions to the numerical values from both encyclopedia and book chapters are marginal. The role of a time span on m_A is also examined in two cases in relation to career activity considerations. It can be considered that the findings serve as a contrasting point of view on how to quantify an individual (publication) career as recently done by Petersen et al. (2010, 2012, 2011) [2–4], here emphasizing the collaboration size and evolution, rather than a citation count, moreover specifying the type of publication. Through the various m_A's one can distinguish different behavior patterns of a scientific publication with CAs.

1. Introduction

In order to justify and/or promote a young researcher's work, he/she is often sent to present his/her research at scientific meetings, and publish the research results in proceedings. It is also somewhat commonly accepted, without any proof, that

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proceedings papers contain more coauthors than peer review journals. One does not question here whether one should be considering the publications in proceedings and those in peer review journals with an equal weight to measure the value of some scientific report. In favor of publishing contributions in proceedings, it seems to be one way to justify more quickly the time spent by a visitor in a team or in a laboratory,—because conference proceedings are thought to be less strict or take less time at the reviewer level than well established peer review journals. Necessarily, the team leader or laboratory coordinator is associated to such publications, justifying his/her principal investigator (PI) status. Of course, the PI number of publications is then increased greatly. One basic question which would seem to be raised on such aspects of scientific life concerns the number of relevant coauthors for the set of publications of a PI. One may wonder about their quantitative role for a PI or the team.

Ausloos' "coauthor core" definition and its subsequent measure [1] tackle such considerations in a constructive way, through the relationship between the number (J) of (joint) publications with coauthors ranked according to rank (r) importance. The approach presents great differences with respect to the recent Petersen et al. career life time, growth and/or decay considerations [2] later expanded in Refs. [3,4]. These emphasize the citation count within some Hirsch index idea [5,6], taking into account some normalization based on the group size and its time evolution, yet mainly testing the popularity of a *paper*. Ausloos' approach emphasizes the role of *persons* in a team scientific production, in relation with a PI, rather than citations.

In fact, the PI behind and in a publication is sometimes hard to define. It is known that the notion of PI arises from administrative considerations. Sometimes a coauthor (CA), not necessarily receiving the first place in a coauthor list on a publication, has played an important role in the scientific investigations. However, without a criterion, one cannot write that such a CA has done "more work" than a PI,—or conversely. That is one of the main reasons why the wording PI will be thereafter abandoned and replaced by LI standing for "leading investigator", e.g., as someone accepted by the community as a well known leader for some investigation.

Usually the position on a CA list in a publication hints toward some responsibility, but not always. The expected emphasis on the position of a scientist on a publication list is a delicate matter when quantifying a contribution. The more so because it is thought that abusive coauthorship and publication parasitism exists, as emphasized by Kwok [7], i.e. the "White Bull effect". Sometimes indeed, a large quantity of so called proceedings papers or invited lectures have many coauthors,—usually in order to take into account various contributions on the reviewed subject and/or to promote team size visibility, among many other likely reasons.

On the other hand, recall that the m_A-index [1] measures the core of coauthors in a research team, as if centered on a researcher, a LI, who can be anyone. The m_A-index is deduced from a plot of the number (J) of joint publications of this LI with CAs ranked according to their rank (r) of importance; $r = 1$ being the most prolific CA with the LI.

Ausloos [1] has found a simple power law relating J and r

$$J \propto 1/r^{\alpha}. \tag{1}$$

The power law exponent α is not exactly $+1$. It depends on the examined data range,—as usual; this is well known [8]. One may also conjecture that irregularities and deviations from such a simple analytic law, Eq. (1), may be due to: publication inflation, proceedings counting, coauthorship inflation, for whatever reason [9],—even considering that all counts are made on a reliable data basis. Nevertheless, from this point of view, one can derive the m_A-index, giving the core of coauthors range, through a condition similar to that defining the h-index of a scientist [5,6], i.e.

$$m_A \equiv r, \quad \text{such that } r \leq J. \tag{2}$$

Most likely, Ausloos' law, Eq. (1), seems to be best for large teams, and/or for authors having many publications and many coauthors. Indeed, as pointed out already in Ref. [1], when an author has few publications, or has few coauthors, the law might be a statistically poor description of the (rare) empirical data. On the other hand, deviations in the presence of a large set of publications and a large set of coauthors might be due to several causes.

So called "intrinsic causes" might arise from a large productivity of the group based on a high turnover of young and junior researchers, with $r \gg 1$, but having few J with the LI. On the other r range, i.e., for small r, many contributions may arise from stable partners who provide visibility of the team by going to conferences and summer schools. Among "extrinsic causes", one can simply also mention funding conditions or applications for funding constraints requesting to show the rather large size of the LI team. Indeed, public and private research funding agencies *claim* to search for and to promote such collaborations. Again, to estimate the quality of such CA is far from obvious, as is to measure their internal impact for the team and LI.

Therefore it is of interest to examine the generality of Eq. (1). This is made here by breaking the overall publication list into specific types of publications, like in peer reviewed journals, proceedings and invited chapters of books or encyclopedias, ... Several LI cases are studied here. As examples, two well known LI in statistical physics: (i) H.E. Stanley (HES), the most prolific of such authors (with the highest h-index known for physicists, $h > 115$, though this is irrelevant for the present purpose); and (ii) D. Stauffer (DS), an accepted leader in theoretical and numerical statistical physics. Moreover, (iii) M. Ausloos (MA), who invented the m_A-index [1] is included, due to his large publication list with CAs, in the same quantitative range as DS, but with papers much less quoted than those of HES or DS.