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CLIQUE FORMATION IN COMPETITIVE, PEER-REVIEWED FUNDING PROGRAMS

A significant part of funding intended to drive the research and development (R&D) processes are distributed in various variants of competitive programs. Many of these rely on peer-review to evaluate the proposed research projects and to recognize the projects that combine innovation with greatest chances of success. The review process is known to suffer from several shortcomings, including mediocrity bias, lack of acceptance for truly novel ideas, institutional cronyism and formation and influence of 'old boy' networks (cliques), to name a few. The process has been studied, both conceptually and empirically, with the aim of reducing the unwanted effects, but the proposed improvements - if any - have been swamped by the near-exponential growth of the number of researchers, research proposals and increasingly competitive nature of research funding. Combined with much slower growth of funds, the problem of correct assessment of proposal innovativeness and value becomes more and more important.

We present a simple mathematical model of the process of proposal evaluation, taking into account the effects of a formation of a clique of researchers influencing the system to increase their chances of obtaining grants (old boy network). The influence may take place at two stages: selection of the members of the evaluation committees and the actual selection of the proposals approved for funding. Both lead to an establishment and growth of an insider clique due to higher chances of obtaining the research funding. While the qualitative behavior is similar in the two strategies, manipulating both the review panel composition and the proposal selection leads to much higher 'returns' to the clique members. It is shown that while increasing the panel size (as has been suggested in some analyses) may slow down the clique formation, it is not a sufficient solution for the problem of clique formation.

The simple analytical model may be further expanded, using agent based simulations (ABS) that include more realistic assumptions of the behavior of the involved parties. Such ABS model allows, for example, to study the effects of the system on the effectiveness of the proposal selection scheme in supporting true and valuable innovation.