

**Yanmeng Xing, Ying Fan, Roberta Sinatra and An Zeng (An Zeng Guangdong University of Technology) - The neglected risk of working in a big scientific group**

In science, mentorship is a determinant of the achievements of both mentees and mentors. Various existing works have revealed the positive association between the success of the mentors and mentees, ranging from academic proliferation and prizes. Nevertheless, academia also experiences a high dropout, especially among researchers at early career stages, even in successful groups. Specifically, we collect genealogical data on nearly 350,733 mentor-mentee pairs and 309,654 scientists who published 9,248,726 papers in chemistry, physics, or neuroscience from 1900 to 2021 and investigate the relationship between mentor and mentee achievements. We find that the mentees trained in large groups perform better than those from small groups if they work in academia after training. The degree of collaboration with a mentor during the training period is positively associated with the mentee's long-term academic performance. However, we also find two surprising results : (1) Mentees from large groups have a lower academic survival rate than those from small groups. (2) The more productive a mentor is, the smaller the probability a mentee survives in academia. Furthermore, the evolution analysis over 60 years shows that the large laboratories are losing advantages in transporting talents into academia. Taken together, we surprisingly find that the success of the mentors could act as a negative factor associated with the survival rate of the mentees in academia. Our findings have the potential to give practical suggestions to individuals and education managers concerning career development and researcher cultivation.