



Université
de Liège



On **collaboration** and **competition** in scientific community

Kirill Bessonov

Montefiore PhD student meeting

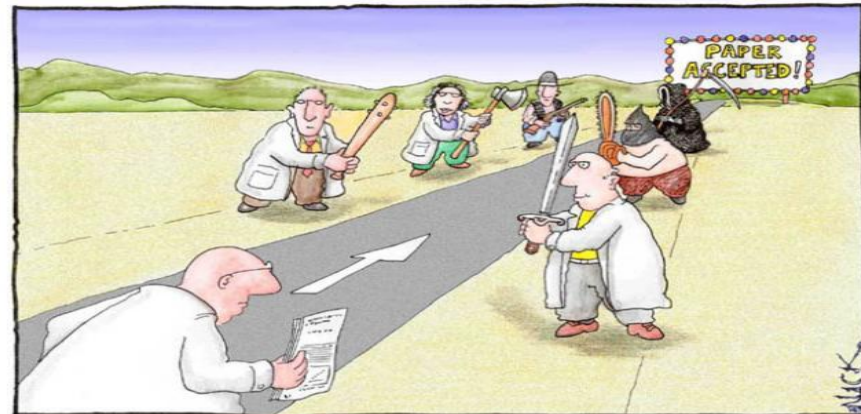
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Sections

- Scientific community **properties** and **origins**
- **Collaboration** aims and motives
- Competition in science today
 - Pros and Cons
- Negative aspects of competition exemplified

Properties of scientific community

- Organized in groups
- The community has certain hierarchy
 - Not all scientists are equal
 - Elite/very successful (edit journals, allocate funds)
 - Less successful
- The community has its rules – professionalism
 - Rules and rights to its group members
 - Recognition/distinction of its members
 - Nobel prizes
 - Awards
 - Academic degrees
- Relies on society support



Collaboration

- Officially documented in XII century
 - Leader is France
 - Strongest collaboration rates in XII century
 - In England the science was done individualistically
 - “Lone Wolf” style
 - In Italy and France investigations done in group
 - “The Committee of the Whole”
- **Reason:** to advance science for the science’s sake but sacrificing individuality (altruistic motives)
- Necessary to deal with **cross-discipline** problems

Motives for collaboration

List of motives

To gain **access** to special equipment and skills

Increase **efficiency** by saving **time** and **labor**

Avoid **competition**

Avoid intellectual **isolation** (visibility and recognition)

To gain **experience**

To **train** researchers

One person is **not a warrior against whole army**



collaborate



Collaboration today

- Collaboration is complex nowadays
 - Deformed by unhealthy competition
 - Requires strategic planning
 - Commercialization of science



Competition and competitiveness

Competition is “a process or condition underlying the distribution of resources and rewards” [2]

Competitiveness “refers to a bidder’s fitness for a contest or likelihood of winning” [2]

High competitiveness is highly desired by each scientist in an ever increasing competitive climate [2]

*“Because **science** is a **cumulative, interconnected, and competitive enterprise**, with tensions among the various societies in which research is conducted, now more than ever researchers must balance **collaboration** and **collegiality** with **competition** and **secrecy**” [4]*

Competition targets

- Scientific community was always competing due to scarce resources
- Competition seeks / fights for:
 - Superiority
 - Influence
 - Recognition / Prestige
 - Faculty positions
 - Publications (quantity / quality)
 - Students
 - Many other reasons

Effects of healthy and unhealthy competition

Positive ("healthy" competition)	Negative (unhealthy competition)
Promotes innovation/productivity	1.Academic misconduct
Open examination of work / proposals by others	2.Strategic behavior and game-playing "desire to look good"
Promotes fair judgment	3.Decline of information open-sharing
Advances science more rapidly due to incentives for ones efforts	4.Sabotage of others' ideas and work
	5.Peer-review processes interference
	6.Deformation of peer relationships
	7.Careless research behavior

The Perverse Effects of Competition on Scientists' Work and Relationships

Melissa S. Anderson · Emily A. Ronning ·

- 2002 study on 51 early- and mid-career scientists at major research universities in USA
- Based on data records on NIH-grant (R01) and postdoctoral (T32, F32) 1st time award recipients

Negative aspects of competition

- The nature of competition had changed
 - mainly linked to negative outcomes[5]
 - negatively correlated with sense of community
 - high correlation with **unethical behavior**[2]
 - scientific fraud will become more common[2]
 - high **pressure** to publish (quantity but not quality)



Causes of negative competition

- Why it all happened?
 - “intense struggle of **scarce resources**”
 - **excess supply** of human capital [2]
 - Labor excess economy – “*legion of discontented*” [6]
 - keeps **costs down** and **productivity high**
 - **pyramid scheme** in science hierarchy
 - » with an expanding base of newcomers providing inexpensive, highly skilled labor
 - » few scientists at the top hierarchy (elite)
 - Institutions seek money and prestige
 - Converted in money-making machines



1. Strategic game-playing

- To survive in scientific community requires careful **strategic planning**
 - Desire for good reputation
- Examples
 - Not giving credit to other scientists
 - Only doing experiments that give money and recognition
 - Change of research focus due to topic popularity or change get funded
 - Research half-done before grant application



2. Decline of information open sharing

- More and more scientists play a strategic game
- Reluctance to share information
 - May lose competitive advantage
 - Ideas might be stolen
- Perception that “people are after one’s ideas” [2]



*“There are other people that have **huge labs**. They come in and they see what you did. They send, like, five or six postdocs to do it, and **they publish it before you did**” - study participants’ opinion on presenting at conferences [2]*

3. Sabotage of others' ideas and work

- Sabotage of others' progress
 - taking photos of posters and publish it before the original author
 - not including full detail of protocol in publications
 - omit “*tiny little details*” [2]
 - stealing others ideas (e.g. during grant review)
 - big vs small lab competition



4. Interfering with peer-review process

- **Strategic behavior** of reviewers during proposals review, manuscript publication
 - Game-playing (e.g. delaying publication)
 - Sabotage of others' ideas
- Opportunity to take advantage by reviewers
- Reviewers are overwhelmed
 - Not thorough review of submitted material
- Solution
 - ask certain reviewers not be included in review process

"If they [reviewers] don't like it, you'll never get published. You proved them wrong? ... You better have tenure or something!"[2]

5. Deformation of relationships

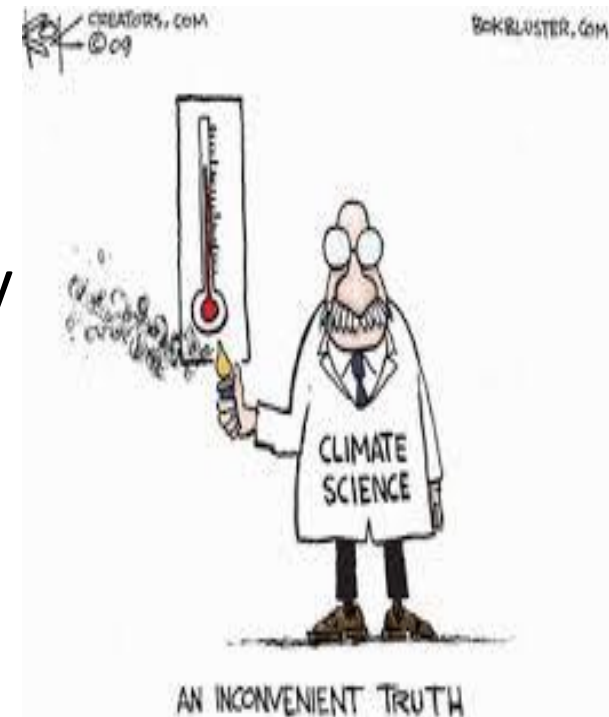
- Excessive competition deforms relationships
- PhD students and post-docs mostly affected
 - “students are reagents” [2]

Some PhD advisors “will take **two** postdoctoral fellows, after their Ph.D.’s, put them **on exactly the same project**, and one person gets the paper, period, and the other one gets zero” [2]

PhD advisor “There are going to be kids that **aren’t going to make it**. I know they’re not going to make it, but I’m going to lie to them. I’m going to say, “Well, you **might** get a Ph.D.” And I know that their chances are probably one in three ... I might **need that work**, those pair of hands at that particular point and time” [2]

6. Careless research behavior

- **Cutting corners** to get research published
- Dishonesty more frequently with PostDoc due to publication pressure
 - Least experience you have, more you've been asked
 - Desire to move-on in life
- Deterioration of paper quality
 - emphasis on quantity and not quality
- Selecting best results to show
- Biased interpretation of data



Final thoughts

- In past 30 years research landscape (especially in USA) had changed dramatically
 - From altruist aim of expanding population knowledge to **scientific enterprise** of knowledge production
- Research driven by market-capitalism(competition)
- Competition levels are **damaging to innovation**[2]
- Little attention is paid to **negative competition**
- We should aim to less competitive universe
 - Science objective is to serve humanity
 - Balance in number of scientists and resources

The background of the image is a deep space photograph. It features a vast field of stars, with a prominent, bright, yellowish-white galaxy core in the center. The galaxy's structure is elongated and slightly curved, with a dense concentration of stars and dust. The surrounding space is filled with numerous smaller, distant stars, some appearing as bright points of light and others as faint, diffuse clouds. The overall color palette is dominated by deep blues and blacks, with the warm tones of the galaxy's core providing a focal point.

Thank you for your attn!

*“Everyone thinks of changing the world,
but no one thinks of changing **himself**”*

Leo Tolstoy

References

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