

My Brother's Keeper

Thoughts on the Challenges of
Research Collaboration

Max Weber

"The intellect, like all cultural values, has created an aristocracy based on the possession of rational culture and independent of all personal ethical qualities of man. The aristocracy of intellect is hence an unbrotherly aristocracy."

Sigmund Freud

- My emotional life has always insisted that I should have an intimate friend and a hated enemy. I have always been able to provide myself afresh with both, and it has not infrequently happened that friend and enemy have come together in a single individual, though not, of course, both at once.
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- Today the solitary scientist – armed with the tools of a single discipline – seeking to conquer some devastating disease is largely a romantic myth. Francis Macrina
 - From 1930 to 1989 the mean number of authors per biomedical research article increased from 1.3 to 6.0
 - In Britain, from 1988 to 1995, the mean number of authors' addresses has increased from 1.7 to 2.0
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Collaboration – A process by which parties who see different aspects of a problem can constructively explore their differences and search for solutions that go beyond their own limited vision of what is possible
Barbara Gray

- Key concepts
 - Interdependence
 - Joint ownership
 - Collective responsibility
 - Solutions emerge from addressing differences
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Problems that lend themselves to collaboration

1. Ill-defined problems or disagreements regarding definition
 2. Multiple stakeholders with vested interests
 3. Disparity of power or resources among stakeholders
 4. Different levels of expertise and different levels of access to relevant information
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5. Problems characterized by technical complexity and scientific uncertainty
 6. Differing perspectives on a problem leading to adversarial relations
 7. Unilateral efforts unsuccessful
 8. Existing processes insufficient to address problems
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Organizational Barriers to Collaboration

- 1. Review and rewards
 - A. Emphasis on first and last authored papers
 - B. Preference for independent investigator initiated research programs
 - C. Punishment of young scientists for collaborating
 - D. Need for reviewers who understand multi-disciplinary, interdisciplinary, and translational research
 - E. Need for reviewers who can recognize the contributions of researchers involved in joint research endeavors
 - F. Study sections organized by discipline
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Organizational Barriers to Collaboration

2. Funding/Support

- A. Difficulty in obtaining support for high risk, long term projects
 - B. Space – inadequate design (research motels)
 - C. Recruitment and retention of high quality fellows
 - D. Absence of training in collaborative research
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The complexities of collaboration

It is easy for a senior scientist to be collaborative and part of a team: they already have tenure. People already know who they are

Alan Leshner

Collaboration introduces into scientific work dimensions of interpersonal interaction that are not ordinarily considered very important in scientific work

The complexities of collaboration

1. Decision making processes
2. Accountability and responsibility
3. Autonomy
4. Shared ownership

Collaboration requires new social relationships/arrangements – how to integrate multiple approaches to a problem

The problems of language

- The problem of language and its pragmatics is perhaps most visible in interdisciplinary areas of research – chemical biology, computational chemistry, computational biology, bioinformatics – that span more than one field.

Konopka and Crabbe

- A question – Do concepts and paradigms from contributing fields retain their original meaning or even still make sense in the new interdisciplinary field?
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- Importance of developing a common language as a prerequisite for collaborative work.
 - As the process of translation from the conceptual vocabulary of one discipline to another proceeds members check the accuracy of their interpretations by means of metaphor and analogy. The result is a shared conceptual vocabulary, smaller and less specialized than the vocabulary of any single discipline, but enabling each network member to assimilate the work of the other into his own.
- Kahn and Prager
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- Multidisciplinary research – researchers in different disciplines work independently or sequentially, each from his or her own disciplinary-specific perspective, to address a common problem. (Rosenfield)
 - Interdisciplinary research – a cooperative effort by a team of investigators, each expert in the use of different methods and concepts, who have joined in an organized program to attack a challenging problem (IOM)
 - Transdisciplinary research – the development of a common conceptual framework that bridges the relevant disciplines and that can serve as the basis for generating new research questions directly related to the defined problem
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Adversarial Collaboration

- Empirical resolution of scientific disputes through a facilitated collaboration
 - Jointly designed studies to speak to disputed issues and narrow or clarify differences
 - Both parties agree on empirical tests for resolving a dispute and to conduct these tests with the help of a third party scientist arbiter/mediator
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The adversarial collaboration process

1. Systematic review of relevant studies
 2. Formulate hypotheses
 3. Argue and develop procedures to test hypotheses
 4. Implement procedures
 5. Analyze and re-analyze data
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Adversarial Collaboration

Success is measured by

- 1. Yielding surprising results
 - 2. Producing insightful discussion
 - 3. Generating testable hypotheses about outstanding issues
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The challenge of adversarial collaboration

- ❑ 1. Ego threatening
 - ❑ 2. Possibility of being shown to be wrong
 - ❑ 3. Personal animosity or competition
 - ❑ 4. ideological/theoretical/paradigmatic differences
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Preconditions for adversarial collaboration

- 1. Acknowledge possibility of differences residing in procedural differences
 - 2. Trusted 3rd party
 - 3. Differences not too deep or too philosophical
 - 4. Curiosity about differences stronger than commitment to one's position
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Prenuptials for scientists: collaborative research agreements

- Categories to be covered
 - 1. goals of collaboration
 - 2. scientific parameters
 - Respective contributions
 - Research Agenda
 - Decision making
 - Authorship and acknowledgment
 - Publicity
 - Intellectual property, patents and copyrights
 - Data Management
 - Sharing materials and resources
 - Collaboration with non-signatories
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Collaborative research agreements

- 3. Project management
 - Process
 - Communications
 - Dispute resolution
 - Confidentiality
 - Administration
 - Financial obligations
 - Legal obligations
 - Accountability
 - Quality assurance
 - Staffing
 - Duration and time frames
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