Sharing the spoils: the trouble with reputation as a motivation and reward for teamwork

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One key difference between teams in science and teams elsewhere is the central importance of academic reputation as the primary reward for work in science. In this presentation I will draw on empirical and conceptual work to discuss how reputation as a reward is different from other rewards when it comes to collaboration, including rewards in the form of money, learning, enjoyment, and the use-value of shared artifacts (like software, data, or instruments). I frame the problem of collaboration in a restricted form to focus this inquiry: collaboration requires solving a "division of claims" problem. Participants in an undertaking with shared outcomes must have some way of resolving and distributing the results; sharing the spoils, so to speak. If those divisions are perceived to be at risk of being unfair then this is a significant barrier to collaboration. This is, of course, a rank simplification, but hopefully a useful one.

When the motivation for collaboration is experiential (enjoyment or learning) the division is relatively straightforward, since each participant ends the collaboration wholly possessing his or her experience. When the motivation for collaboration is in the creation of a shared artifact, the division of claims can proceed in two ways. If the artifact is digital, then all participants can receive a full copy. If the artifact is physical, then the artifact can be shared through time-slicing, as when a collaboration builds a scientific instrument like a Synchotron, telescope, or a sample collection (like blood in the MACS AIDS research collaboration). Money, of course, is nearly ideal for settling the division of claims, since (physically at least) it can be easily and simply divided by participants according to a pre-arrangement. Once split money stays split; it is under the control of participants.

Reputation, on the other hand, is quite a tricky thing to divide. This is in part because reputation is not a substance, nor an experience, nor an artifact. The "stuff" of reputation is different. Reputation is in the eye of the beholder, it derives its value through how others perceive the world. And it is difficult for participants to control how others perceive the world and their collaboration. Long-lived and widely perceived (and thus valuable) scientific reputation requires the association of an individual with a contribution; teams, at the very least, place a level of indirection in this association. Yet teams may do worse than this: For example the well-known Matthews Effect in citations has this form: readers tend to attribute greater contribution in publications to those who are already known. Similarly, as we observed in an empirical study of the production of scientific software, initial creators are perceived as likely to garner the reputational benefits of software projects preferentially even long after their initial contributions, discouraging collaborations. These problems are particularly acute when teamwork involves aggregation and integration of contributions.

Of course real world participants in collaborations have multiple, overlapping and competing motivations for their participation; the world is not as simple as our analytic concepts. Yet by treating rewards of collaboration separately we may advance teamwork in science. For example, four strategies present themselves. First, groups considering collaboration could seek to resolve reputational divisions upfront, at least as far as they are able, through shared publication agreements. Second, artifact building groups may wish to organize their collaboration in a manner that avoids aggregation and integration (such as using a plugin architecture for their software or datasets). Third, groups may agree to (or come to use after the fact) accounting systems identify contributions within teams, such as drawing on version control systems or post-hoc descriptions of who really did what within a team (as with letters of recommendation in high energy physics collaborations). Finally, and more innovatively, it may be more appropriate to construct scientific teams not with the expectation of joint reputational rewards at all (writing papers together) but around experiential and, especially, use-value rewards, learning more from the organization of open source software projects than the organization of business startups.