

Scientists are more specialized in larger and interdisciplinary teams

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Contemporary scientific challenges increasingly require large teams and interdisciplinary perspectives. However, it is not fully understood how these trends affect the division of labor among team members. In other

words, how do team members divide the work and how do teams assure that individuals' contributions are brought back together to solve a scientific problem?

Henry Sauermann, Professor of Strategy at ESMT Berlin, and Prof. Carolin Haeussler from the University of Passau, conducted a study on the impact of increased team size and interdisciplinarity on the division of labor. They analyzed author contribution statements from 12,964 published articles in a range of fields and compared the extent to which team members engaged in various research activities such as conceptualizing the project, collecting data, and writing the paper.

They found that division of labor increased with the size of the team, meaning a higher proportion of team members specialized in fewer tasks, sometimes only contributing to one [activity](#). However, generalist members, which are less specialized and contribute to multiple activities, did not disappear completely. The share of specialist members stopped increasing at around 30% in teams with 15 members, while the share of generalist members decreased before stabilizing at around 18% in groups of 10 members. Therefore, although the proportion of specialists increased and generalists decreased, even larger teams were composed of a mix.

Interestingly, these trends towards specialization differ depending on the particular research activity. Prof. Sauermann says, "Conceptual activities such as designing the study tend to be shared more than empirical activities in small teams. However, in larger teams it is the reverse, with empirical activities being shared more widely than conceptual activities."

The authors also find that [interdisciplinary](#) teams use greater division of labor—team members tend to specialize in fewer research activities. But there is an interesting twist, says Prof. Haeussler: "Some teams gain interdisciplinary perspectives by bringing together field specialists such

as an engineer and a biologist. Other teams are composed of individuals who are themselves interdisciplinary in their backgrounds—think bio-engineers. We see that different approaches to interdisciplinarity have very different implications for how [labor](#) is divided between [team members](#)."

The authors also find important differences in task allocation depending on scientists' individual characteristics, with women more likely to be involved in performing experiments than conceptual activities. Moreover, Haeussler and Sauermann note that many teams seem to violate common authorship guidelines, which require authors to be involved in both empirical and conceptual activities. As such, authorship guidelines may need to be revised to accommodate increasing specialization in scientific work.

More information: Carolin Haeussler et al, Division of labor in collaborative knowledge production: The role of team size and interdisciplinarity, *Research Policy* (2020). [DOI: 10.1016/j.respol.2020.103987](#)

Provided by ESMT Berlin

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