

Balancing Teams through Accountability

Capsule: If all members of a group can benefit from collective action, the only deterrent from benefiting without contribution is the avoidance of punishment. This has implications in encouraging group members in lab groups and other cooperative activities to demand accountability and withhold rewards based on participation.

Summary: Boyd and Mathews highlight that, in a group dynamic, participants can be thought either as contributors, working together and benefiting from the collective good, defectors, not contributing and benefiting, or nonparticipants, not contributing to the collective good but not consuming benefits, rather engaging in an independent activity. Furthermore, amongst the group of contributors, there are those who punish defectors, the punishers, and those who do not. In the group dynamic, punishers are necessary to ensure that the defectors do not dominate the group and perpetuate apathy, however, a critical mass of punishers is necessary as large groups of defectors make it difficult for individuals feel as if they must punish the whole group for substandard participation. This theory goes on to postulate that the evolution of groups is cyclical. In a group of defectors, nonparticipants will appear gradually to work independently. In a group of nonparticipants, contributors will gradually appear because two contributors can achieve more than two nonparticipants acting alone. In a group of contributors, defectors will start to appear again and, without a punisher, will dominate the group and begin the cycle again. For this reason, punishers readily invade this cyclical group of people and act to stabilize the group shifting, and keep the group in a better situation for a longer period. The idea of a “punisher” is to encourage individuals to demand accountability of all group members to maintain group stability.

Implications in Engineering Education: In the scope of engineering education, where collaborative groups are prevalent in laboratory courses, in solving problem sets, or in design projects, keeping all students involved in the process is necessary to extract the maximum educational benefit. While much has been reported on how to handle problematic members of a cooperative group, this report on the theory of group dynamics and evolution of group participants encourages instructors to convince all students in the group to demand accountability of one another. The group must have contributors, but also must have a critical mass of punishing contributors to appropriately influence defectors in the group. The form of punishment available to contributors, beyond that of communicating to the instructors on a student’s lack of participation, may only be verbal “reprimand” or exclusion in attractive parts of a particular activity, but this may prove effective in utilizing these individuals to reach the common good. One other point raised by this paper is the necessity for the benefits to be excludable, i.e. the students acting as contributors, defectors, and non-participants should not get the same grade, but rather have some sort of intra-group evaluation. This serves as a form of punishment from the instructor to mediate the defectors (in particular) beyond the punishment administered by contributors in the group.

References: R. Boyd and S. Mathew (2007). "Behavior - A narrow road to cooperation." *Science* 316(5833): 1858-1859.

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