



PSYCHOLOGY

Social Savvy Boosts the Collective Intelligence of Groups

People who are good at solving one type of brainteaser tend to excel at a variety of mental calisthenics—support, many psychologists say, for the concept of general intelligence. A study published online this week in *Science* (www.sciencemag.org/cgi/content/abstract/science.1193147) extends this concept to groups of people, arguing that groups have a “collective intelligence” that predicts their performance on a range of collaborative tasks.

The researchers, led by Anita Woolley, an organizational psychologist at Carnegie Mellon University in Pittsburgh, Pennsylvania, reached this conclusion after studying 699 people working in small groups. They also investigated why some groups appear to be smarter than others. Surprisingly, the average intelligence of the individuals in the group was not the best predictor of a group’s performance. The degree to which group members were attuned to social cues and their willingness to take turns speaking were more important, as was the proportion of women in the group.

“This paper really takes all the lessons of 100 years of psychometric research on individual intelligence and applies it in a novel way to look at group decision-making,” says Richard Haier, a neuroscientist at the University of California, Irvine, who studies intelligence. “You can get a lot of interesting ideas out of this.”

In the first part of the study, Woolley and colleagues at the Massachusetts Institute of Technology recruited 120 people from the Boston area and randomly assigned them to teams of three. Whereas most previous research has focused on what makes certain teams excel at a

given type of task, Woolley says she wanted to look instead at whether a team’s performance on one task generalizes to others.

Teams worked on a variety of tasks, including brainstorming to come up with possible uses for a brick and working collaboratively on problems from a test of general intelligence called Raven’s Advanced Progressive Matrices. These problems involve evaluating several shapes arranged in a grid and identifying the missing item that would complete the pattern. The groups also worked on more real-world scenarios, such as planning a shopping trip for a group of people who shared a car. The researchers scored these tests according to predetermined rules that considered several factors (awarding points when shoppers got to buy items on their list, for example). Each participant also took an abbreviated version of the Raven’s test as a measure of individual intelligence.

These experiments showed that a group’s performance on any one task did in fact predict its performance on the others. That suggests that groups have a consistent collective intelligence, Woolley says. She and colleagues calculated a “*c* factor” for each group, based on its performance across tasks, a direct parallel to the much-debated general intelligence factor, *g*. Neither the average intelligence of group members nor the intelligence of its smartest member correlated with the group’s performance.

To investigate further, Woolley and colleagues recruited another 579 people from Boston and Pittsburgh and assigned them to groups of two to five members. This time the researchers did find a weak correlation between both the average and the high-

est individual intelligence of members of a group and its collective intelligence. But other factors were stronger predictors. One was the group members’ average score on a test that required them to infer what was on another person’s mind—whether they were annoyed or worried, for instance—by looking at a photograph cropped to show just the eyes. That suggests that “social sensitivity” is a key ingredient of successful teams, Woolley says. The researchers found that the degree to which members took turns speaking also predicted their performance. The proportion of women in a group also correlated with collective intelligence, but Woolley says much of this effect can be explained by the gender difference in social sensitivity: women tend to have more of it.

The “careful, empirical experiments” are a welcome addition to the literature on teams, which is dominated by observational studies, says Brian Uzzi, a sociologist at Northwestern University in Evanston, Illinois. He agrees with the authors’ conclusion that the collective intelligence of groups may be more amenable to improvement than general intelligence in individuals, which most research suggests is difficult to change. Coaching to improve social perceptiveness and turn taking, or selecting individuals with those tendencies, might make for smarter groups, for example.

Research on how the gender composition of teams affects their performance has a long and controversial history, says Katherine Phillips, an organizational behaviorist at Northwestern. Some studies have found that women improve teams by virtue of their social acuity, whereas others have found that women are more likely to remain quiet and let others have their say in team discussions, sometimes to the detriment of the team. In the current experiments, women may have been more likely to speak up because none of the group members had particular expertise in the problems at hand, Phillips says.

However, the random makeup of the groups may limit the reach of the findings, cautions Linda Gottfredson, a sociologist who studies intelligence at the University of Delaware, Newark. She notes that the groups were composed of strangers. “It is possible that turn taking in conversation was so important for that reason,” she says. “They did not know how bright and sensible the others were.” In a more typical workplace setting, Gottfredson says, individuals would be more familiar with their teammates and know whom to listen to and encourage to speak. In that case, she says, the members’ individual intelligence may be a more important factor than turn taking.

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