

# What Google Learned From Its Quest to Build the Perfect Team

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**Like most 25-year-olds**, Julia Rozovsky wasn't sure what she wanted to do with her life. She had worked at a consulting firm, but it wasn't a good match. Then she became a researcher for two professors at Harvard, which was interesting but lonely. Maybe a big corporation would be a better fit. Or perhaps a fast-growing start-up. All she knew for certain was that she wanted to find a job that was more social. "I wanted to be part of a community, part of something people were building together," she told me. She thought about various opportunities — Internet companies, a Ph.D. program — but nothing seemed exactly right. So in 2009, she chose the path that allowed her to put off making a decision: She applied to business schools and was accepted by the Yale School of Management.

When Rozovsky arrived on campus, she was assigned to a study group carefully engineered by the school to foster tight bonds. Study groups have become a rite of passage at M.B.A. programs, a way for students to practice working in teams and a reflection of the increasing demand for employees who can adroitly navigate group dynamics. A worker today might start the morning by collaborating with a team of engineers, then send emails to colleagues marketing a new brand, then jump on a conference call planning an entirely different product line, while also juggling team meetings with accounting and the party-planning committee. To prepare students for that complex world, business schools around the country have revised their curriculums to emphasize team-focused learning.

Every day, between classes or after dinner, Rozovsky and her four teammates gathered to discuss homework assignments, compare spreadsheets and strategize for exams. Everyone was smart and curious, and they had a lot in common: They had gone to similar colleges and had

worked at analogous firms. These shared experiences, Rozovsky hoped, would make it easy for them to work well together. But it didn't turn out that way. "There are lots of people who say some of their best business-school friends come from their study groups," Rozovsky told me. "It wasn't like that for me."

Instead, Rozovsky's study group was a source of stress. "I always felt like I had to prove myself," she said. The team's dynamics could put her on edge. When the group met, teammates sometimes jockeyed for the leadership position or criticized one another's ideas. There were conflicts over who was in charge and who got to represent the group in class. "People would try to show authority by speaking louder or talking over each other," Rozovsky told me. "I always felt like I had to be careful not to make mistakes around them."

So Rozovsky started looking for other groups she could join. A classmate mentioned that some students were putting together teams for "case competitions," contests in which participants proposed solutions to real-world business problems that were evaluated by judges, who awarded trophies and cash. The competitions were voluntary, but the work wasn't all that different from what Rozovsky did with her study group: conducting lots of research and financial analyses, writing reports and giving presentations. The members of her case-competition team had a variety of professional experiences: Army officer, researcher at a think tank, director of a health-education nonprofit organization and consultant to a refugee program. Despite their disparate backgrounds, however, everyone clicked. They emailed one another dumb jokes and usually spent the first 10 minutes of each meeting chatting. When it came time to brainstorm, "we had lots of crazy ideas," Rozovsky said.

One of her favorite competitions asked teams to come up with a new business to replace a student-run snack store on Yale's campus. Rozovsky proposed a nap room and selling earplugs and eyeshades to make money. Someone else suggested filling the space with old video games. There were ideas about clothing swaps. Most of the proposals

were impractical, but “we all felt like we could say anything to each other,” Rozovsky told me. “No one worried that the rest of the team was judging them.” Eventually, the team settled on a plan for a microgym with a handful of exercise classes and a few weight machines. They won the competition. (The microgym — with two stationary bicycles and three treadmills — still exists.)

Rozovsky’s study group dissolved in her second semester (it was up to the students whether they wanted to continue). Her case team, however, stuck together for the two years she was at Yale.

It always struck Rozovsky as odd that her experiences with the two groups were dissimilar. Each was composed of people who were bright and outgoing. When she talked one on one with members of her study group, the exchanges were friendly and warm. It was only when they gathered as a team that things became fraught. By contrast, her case-competition team was always fun and easygoing. In some ways, the team’s members got along better as a group than as individual friends.

“I couldn’t figure out why things had turned out so different,” Rozovsky told me. “It didn’t seem like it had to happen that way.”

**Our data-saturated age** enables us to examine our work habits and office quirks with a scrutiny that our cubicle-bound forebears could only dream of. Today, on corporate campuses and within university laboratories, psychologists, sociologists and statisticians are devoting themselves to studying everything from team composition to email patterns in order to figure out how to make employees into faster, better and more productive versions of themselves. “We’re living through a golden age of understanding personal productivity,” says Marshall Van Alstyne, a professor at Boston University who studies how people share information. “All of a sudden, we can pick apart the small choices that all of us make, decisions most of us don’t even notice, and figure out why some people are so much more effective than everyone else.”

Yet many of today’s most valuable firms have come to realize that

analyzing and improving individual workers — a practice known as “employee performance optimization” — isn’t enough. As commerce becomes increasingly global and complex, the bulk of modern work is more and more team-based. One study, published in [The Harvard Business Review last month](#), found that “the time spent by managers and employees in collaborative activities has ballooned by 50 percent or more” over the last two decades and that, at many companies, more than three-quarters of an employee’s day is spent communicating with colleagues.

In Silicon Valley, software engineers are encouraged to work together, in part because studies show that groups tend to innovate faster, see mistakes more quickly and find better solutions to problems. Studies also show that people working in teams tend to achieve better results and report higher job satisfaction. In a 2015 study, executives said that profitability increases when workers are persuaded to collaborate more. Within companies and conglomerates, as well as in government agencies and schools, teams are now the fundamental unit of organization. If a company wants to outstrip its competitors, it needs to influence not only how people work but also how they work *together*.

Five years ago, Google — one of the most public proselytizers of how studying workers can transform productivity — became focused on building the perfect team. In the last decade, the tech giant has spent untold millions of dollars measuring nearly every aspect of its employees’ lives. Google’s People Operations department has scrutinized everything from how frequently particular people eat together (the most productive employees tend to build larger networks by rotating dining companions) to which traits the best managers share (unsurprisingly, good communication and avoiding micromanaging is critical; more shocking, this was news to many Google managers).

The company’s top executives long believed that building the best teams meant combining the best people. They embraced other bits of conventional wisdom as well, like “It’s better to put introverts together,”

said Abeer Dubey, a manager in Google's People Analytics division, or "Teams are more effective when everyone is friends away from work." But, Dubey went on, "it turned out no one had really studied which of those were true."

In 2012, the company embarked on an initiative — code-named Project Aristotle — to study hundreds of Google's teams and figure out why some stumbled while others soared. Dubey, a leader of the project, gathered some of the company's best statisticians, organizational psychologists, sociologists and engineers. He also needed researchers. Rozovsky, by then, had decided that what she wanted to do with her life was study people's habits and tendencies. After graduating from Yale, she was hired by Google and was soon assigned to Project Aristotle.

**Project Aristotle's researchers** began by reviewing a half-century of academic studies looking at how teams worked. Were the best teams made up of people with similar interests? Or did it matter more whether everyone was motivated by the same kinds of rewards? Based on those studies, the researchers scrutinized the composition of groups inside Google: How often did teammates socialize outside the office? Did they have the same hobbies? Were their educational backgrounds similar? Was it better for all teammates to be outgoing or for all of them to be shy? They drew diagrams showing which teams had overlapping memberships and which groups had exceeded their departments' goals. They studied how long teams stuck together and if gender balance seemed to have an impact on a team's success.

No matter how researchers arranged the data, though, it was almost impossible to find patterns — or any evidence that the composition of a team made any difference. "We looked at 180 teams from all over the company," Dubey said. "We had lots of data, but there was nothing showing that a mix of specific personality types or skills or backgrounds made any difference. The 'who' part of the equation didn't seem to matter."

Some groups that were ranked among Google's most effective teams, for

instance, were composed of friends who socialized outside work. Others were made up of people who were basically strangers away from the conference room. Some groups sought strong managers. Others preferred a less hierarchical structure. Most confounding of all, two teams might have nearly identical makeups, with overlapping memberships, but radically different levels of effectiveness. "At Google, we're good at finding patterns," Dubey said. "There weren't strong patterns here."

As they struggled to figure out what made a team successful, Rozovsky and her colleagues kept coming across research by psychologists and sociologists that focused on what are known as "group norms." Norms are the traditions, behavioral standards and unwritten rules that govern how we function when we gather: One team may come to a consensus that avoiding disagreement is more valuable than debate; another team might develop a culture that encourages vigorous arguments and spurns groupthink. Norms can be unspoken or openly acknowledged, but their influence is often profound. Team members may behave in certain ways as individuals — they may chafe against authority or prefer working independently — but when they gather, the group's norms typically override individual proclivities and encourage deference to the team.

Project Aristotle's researchers began searching through the data they had collected, looking for norms. They looked for instances when team members described a particular behavior as an "unwritten rule" or when they explained certain things as part of the "team's culture." Some groups said that teammates interrupted one another constantly and that team leaders reinforced that behavior by interrupting others themselves. On other teams, leaders enforced conversational order, and when someone cut off a teammate, group members would politely ask everyone to wait his or her turn. Some teams celebrated birthdays and began each meeting with informal chitchat about weekend plans. Other groups got right to business and discouraged gossip. There were teams that contained outsize personalities who hewed to their group's sedate norms, and others in which introverts came out of their shells as soon as meetings began.



The data didn't offer clear verdicts. In fact, the data sometimes pointed in opposite directions. The only thing worse than not finding a pattern is finding too many of them. Which norms, Rozovsky and her colleagues wondered, were the ones that successful teams shared?

**Imagine you have** been invited to join one of two groups.

Team A is composed of people who are all exceptionally smart and successful. When you watch a video of this group working, you see professionals who wait until a topic arises in which they are expert, and then they speak at length, explaining what the group ought to do. When someone makes a side comment, the speaker stops, reminds everyone of the agenda and pushes the meeting back on track. This team is efficient. There is no idle chitchat or long debates. The meeting ends as scheduled and disbands so everyone can get back to their desks.

Team B is different. It's evenly divided between successful executives and middle managers with few professional accomplishments. Teammates jump in and out of discussions. People interject and complete one another's thoughts. When a team member abruptly changes the topic, the rest of the group follows him off the agenda. At the end of the meeting, the meeting doesn't actually end: Everyone sits around to gossip and talk about their lives.

Which group would you rather join?

In 2008, a group of psychologists from Carnegie Mellon, M.I.T. and Union College began to try to answer a question very much like this one. "Over the past century, psychologists made considerable progress in defining and systematically measuring intelligence in individuals," the researchers [wrote in the journal Science in 2010](#). "We have used the statistical approach they developed for individual intelligence to systematically measure the intelligence of groups." Put differently, the researchers wanted to know if there is a collective I. Q. that emerges within a team that is distinct from the smarts of any single member.



To accomplish this, the researchers recruited 699 people, divided them into small groups and gave each a series of assignments that required different kinds of cooperation. One assignment, for instance, asked participants to brainstorm possible uses for a brick. Some teams came up with dozens of clever uses; others kept describing the same ideas in different words. Another had the groups plan a shopping trip and gave each teammate a different list of groceries. The only way to maximize the group's score was for each person to sacrifice an item they really wanted for something the team needed. Some groups easily divvied up the buying; others couldn't fill their shopping carts because no one was willing to compromise.

What interested the researchers most, however, was that teams that did well on one assignment usually did well on all the others. Conversely, teams that failed at one thing seemed to fail at everything. The researchers eventually concluded that what distinguished the "good" teams from the dysfunctional groups was how teammates treated one another. The right norms, in other words, could raise a group's collective intelligence, whereas the wrong norms could hobble a team, even if, individually, all the members were exceptionally bright.

But what was confusing was that not all the good teams appeared to behave in the same ways. "Some teams had a bunch of smart people who figured out how to break up work evenly," said Anita Woolley, the study's lead author. "Other groups had pretty average members, but they came up with ways to take advantage of everyone's relative strengths. Some groups had one strong leader. Others were more fluid, and everyone took a leadership role."

As the researchers studied the groups, however, they noticed two behaviors that all the good teams generally shared. First, on the good teams, members spoke in roughly the same proportion, a phenomenon the researchers referred to as "equality in distribution of conversational turn-taking." On some teams, everyone spoke during each task; on others, leadership shifted among teammates from assignment to

assignment. But in each case, by the end of the day, everyone had spoken roughly the same amount. "As long as everyone got a chance to talk, the team did well," Woolley said. "But if only one person or a small group spoke all the time, the collective intelligence declined."

Second, the good teams all had high "average social sensitivity" — a fancy way of saying they were skilled at intuiting how others felt based on their tone of voice, their expressions and other nonverbal cues. One of the easiest ways to gauge social sensitivity is to show someone photos of people's eyes and ask him or her to describe what the people are thinking or feeling — an exam known as the Reading the Mind in the Eyes test. People on the more successful teams in Woolley's experiment scored above average on the Reading the Mind in the Eyes test. They seemed to know when someone was feeling upset or left out. People on the ineffective teams, in contrast, scored below average. They seemed, as a group, to have less sensitivity toward their colleagues.

In other words, if you are given a choice between the serious-minded Team A or the free-flowing Team B, you should probably opt for Team B. Team A may be filled with smart people, all optimized for peak individual efficiency. But the group's norms discourage equal speaking; there are few exchanges of the kind of personal information that lets teammates pick up on what people are feeling or leaving unsaid. There's a good chance the members of Team A will continue to act like individuals once they come together, and there's little to suggest that, as a group, they will become more collectively intelligent.

In contrast, on Team B, people may speak over one another, go on tangents and socialize instead of remaining focused on the agenda. The team may seem inefficient to a casual observer. But all the team members speak as much as they need to. They are sensitive to one another's moods and share personal stories and emotions. While Team B might not contain as many individual stars, the sum will be greater than its parts.

Within psychology, researchers sometimes colloquially refer to traits like "conversational turn-taking" and "average social sensitivity" as aspects

of what's known as psychological safety — a group culture that the Harvard Business School professor Amy Edmondson defines as a “shared belief held by members of a team that the team is safe for interpersonal risk-taking.” Psychological safety is “a sense of confidence that the team will not embarrass, reject or punish someone for speaking up,” [Edmondson wrote in a study published in 1999](#). “It describes a team climate characterized by interpersonal trust and mutual respect in which people are comfortable being themselves.”

When Rozovsky and her Google colleagues encountered the concept of psychological safety in academic papers, it was as if everything suddenly fell into place. One engineer, for instance, had told researchers that his team leader was “direct and straightforward, which creates a safe space for you to take risks.” That team, researchers estimated, was among Google’s accomplished groups. By contrast, another engineer had told the researchers that his “team leader has poor emotional control.” He added: “He panics over small issues and keeps trying to grab control. I would hate to be driving with him being in the passenger seat, because he would keep trying to grab the steering wheel and crash the car.” That team, researchers presumed, did not perform well.

Most of all, employees had talked about how various teams felt. “And that made a lot of sense to me, maybe because of my experiences at Yale,” Rozovsky said. “I’d been on some teams that left me feeling totally exhausted and others where I got so much energy from the group.” Rozovsky’s study group at Yale was draining because the norms — the fights over leadership, the tendency to critique — put her on guard. Whereas the norms of her case-competition team — enthusiasm for one another’s ideas, joking around and having fun — allowed everyone to feel relaxed and energized.

For Project Aristotle, research on psychological safety pointed to particular norms that are vital to success. There were other behaviors that seemed important as well — like making sure teams had clear goals and creating a culture of dependability. But Google’s data indicated that

psychological safety, more than anything else, was critical to making a team work.

“We had to get people to establish psychologically safe environments,” Rozovsky told me. But it wasn’t clear how to do that. “People here are really busy,” she said. “We needed clear guidelines.”

However, establishing psychological safety is, by its very nature, somewhat messy and difficult to implement. You can tell people to take turns during a conversation and to listen to one another more. You can instruct employees to be sensitive to how their colleagues feel and to notice when someone seems upset. But the kinds of people who work at Google are often the ones who became software engineers because they wanted to avoid talking about feelings in the first place.

Rozovsky and her colleagues had figured out which norms were most critical. Now they had to find a way to make communication and empathy — the building blocks of forging real connections — into an algorithm they could easily scale.

**In late 2014**, Rozovsky and her fellow Project Aristotle number-crunchers began sharing their findings with select groups of Google’s 51,000 employees. By then, they had been collecting surveys, conducting interviews and analyzing statistics for almost three years. They hadn’t yet figured out how to make psychological safety easy, but they hoped that publicizing their research within Google would prompt employees to come up with some ideas of their own.

After Rozovsky gave one presentation, a trim, athletic man named Matt Sakaguchi approached the Project Aristotle researchers. Sakaguchi had an unusual background for a Google employee. Twenty years earlier, he was a member of a SWAT team in Walnut Creek, Calif., but left to become an electronics salesman and eventually landed at Google as a midlevel manager, where he has overseen teams of engineers who respond when the company’s websites or servers go down.

## Illustration by James Graham

Illustration by James Graham

“I might be the luckiest individual on earth,” Sakaguchi told me. “I’m not really an engineer. I didn’t study computers in college. Everyone who works for me is much smarter than I am.” But he is talented at managing technical workers, and as a result, Sakaguchi has thrived at Google. He and his wife, a teacher, have a home in San Francisco and a weekend house in the Sonoma Valley wine country. “Most days, I feel like I’ve won the lottery,” he said.

Sakaguchi was particularly interested in Project Aristotle because the team he previously oversaw at Google hadn’t jelled particularly well. “There was one senior engineer who would just talk and talk, and everyone was scared to disagree with him,” Sakaguchi said. “The hardest part was that everyone liked this guy outside the group setting, but whenever they got together as a team, something happened that made the culture go wrong.”

Sakaguchi had recently become the manager of a new team, and he wanted to make sure things went better this time. So he asked researchers at Project Aristotle if they could help. They provided him with a survey to gauge the group’s norms.

When Sakaguchi asked his new team to participate, he was greeted with skepticism. “It seemed like a total waste of time,” said Sean Laurent, an engineer. “But Matt was our new boss, and he was really into this questionnaire, and so we said, Sure, we’ll do it, whatever.”

The team completed the survey, and a few weeks later, Sakaguchi received the results. He was surprised by what they revealed. He thought of the team as a strong unit. But the results indicated there were weaknesses: When asked to rate whether the role of the team was clearly understood and whether their work had impact, members of the team gave middling to poor scores. These responses troubled Sakaguchi, because he hadn’t picked up on this discontent. He wanted everyone to

feel fulfilled by their work. He asked the team to gather, off site, to discuss the survey's results. He began by asking everyone to share something personal about themselves. He went first.

"I think one of the things most people don't know about me," he told the group, "is that I have Stage 4 cancer." In 2001, he said, a doctor discovered a tumor in his kidney. By the time the cancer was detected, it had spread to his spine. For nearly half a decade, it had grown slowly as he underwent treatment while working at Google. Recently, however, doctors had found a new, worrisome spot on a scan of his liver. That was far more serious, he explained.

No one knew what to say. The team had been working with Sakaguchi for 10 months. They all liked him, just as they all liked one another. No one suspected that he was dealing with anything like this.

"To have Matt stand there and tell us that he's sick and he's not going to get better and, you know, what that means," Laurent said. "It was a really hard, really special moment."

After Sakaguchi spoke, another teammate stood and described some health issues of her own. Then another discussed a difficult breakup. Eventually, the team shifted its focus to the survey. They found it easier to speak honestly about the things that had been bothering them, their small frictions and everyday annoyances. They agreed to adopt some new norms: From now on, Sakaguchi would make an extra effort to let the team members know how their work fit into Google's larger mission; they agreed to try harder to notice when someone on the team was feeling excluded or down.

There was nothing in the survey that instructed Sakaguchi to share his illness with the group. There was nothing in Project Aristotle's research that said that getting people to open up about their struggles was critical to discussing a group's norms. But to Sakaguchi, it made sense that psychological safety and emotional conversations were related. The behaviors that create psychological safety — conversational turn-taking

and empathy — are part of the same unwritten rules we often turn to, as individuals, when we need to establish a bond. And those human bonds matter as much at work as anywhere else. In fact, they sometimes matter more.

“I think, until the off-site, I had separated things in my head into work life and life life,” Laurent told me. “But the thing is, my work is my life. I spend the majority of my time working. Most of my friends I know through work. If I can’t be open and honest at work, then I’m not really living, am I?”

What Project Aristotle has taught people within Google is that no one wants to put on a “work face” when they get to the office. No one wants to leave part of their personality and inner life at home. But to be fully present at work, to feel “psychologically safe,” we must know that we can be free enough, sometimes, to share the things that scare us without fear of recriminations. We must be able to talk about what is messy or sad, to have hard conversations with colleagues who are driving us crazy. We can’t be focused just on efficiency. Rather, when we start the morning by collaborating with a team of engineers and then send emails to our marketing colleagues and then jump on a conference call, we want to know that those people really hear us. We want to know that work is more than just labor.

Which isn’t to say that a team needs an ailing manager to come together. Any group can become Team B. Sakaguchi’s experiences underscore a core lesson of Google’s research into teamwork: By adopting the data-driven approach of Silicon Valley, Project Aristotle has encouraged emotional conversations and discussions of norms among people who might otherwise be uncomfortable talking about how they feel. “Googlers love data,” Sakaguchi told me. But it’s not only Google that loves numbers, or Silicon Valley that shies away from emotional conversations. Most workplaces do. “By putting things like empathy and sensitivity into charts and data reports, it makes them easier to talk about,” Sakaguchi told me. “It’s easier to talk about our feelings when we can point to a number.”

Sakaguchi knows that the spread of his cancer means he may not have much time left. His wife has asked him why he doesn't quit Google. At some point, he probably will. But right now, helping his team succeed "is the most meaningful work I've ever done," he told me. He encourages the group to think about the way work and life mesh. Part of that, he says, is recognizing how fulfilling work can be. Project Aristotle "proves how much a great team matters," he said. "Why would I walk away from that? Why wouldn't I spend time with people who care about me?"

**The technology industry** is not just one of the fastest growing parts of our economy; it is also increasingly the world's dominant commercial culture. And at the core of Silicon Valley are certain self-mythologies and dictums: Everything is different now, data reigns supreme, today's winners deserve to triumph because they are cleareyed enough to discard yesterday's conventional wisdoms and search out the disruptive and the new.

The paradox, of course, is that Google's intense data collection and number crunching have led it to the same conclusions that good managers have always known. In the best teams, members listen to one another and show sensitivity to feelings and needs.

The fact that these insights aren't wholly original doesn't mean Google's contributions aren't valuable. In fact, in some ways, the "employee performance optimization" movement has given us a method for talking about our insecurities, fears and aspirations in more constructive ways. It also has given us the tools to quickly teach lessons that once took managers decades to absorb. Google, in other words, in its race to build the perfect team, has perhaps unintentionally demonstrated the usefulness of imperfection and done what Silicon Valley does best: figure out how to create psychological safety faster, better and in more productive ways.

"Just having data that proves to people that these things are worth paying attention to sometimes is the most important step in getting them to actually pay attention," Rozovsky told me. "Don't underestimate the



power of giving people a common platform and operating language.”

Project Aristotle is a reminder that when companies try to optimize everything, it’s sometimes easy to forget that success is often built on experiences — like emotional interactions and complicated conversations and discussions of who we want to be and how our teammates make us feel — that can’t really be optimized. Rozovsky herself was reminded of this midway through her work with the Project Aristotle team. “We were in a meeting where I made a mistake,” Rozovsky told me. She sent out a note afterward explaining how she was going to remedy the problem. “I got an email back from a team member that said, ‘Ouch,’” she recalled. “It was like a punch to the gut. I was already upset about making this mistake, and this note totally played on my insecurities.”

If this had happened earlier in Rozovsky’s life — if it had occurred while she was at Yale, for instance, in her study group — she probably wouldn’t have known how to deal with those feelings. The email wasn’t a big enough affront to justify a response. But all the same, it really bothered her. It was something she felt she needed to address.

And thanks to Project Aristotle, she now had a vocabulary for explaining to herself what she was feeling and why it was important. She had graphs and charts telling her that she shouldn’t just let it go. And so she typed a quick response: “Nothing like a good ‘Ouch!’ to destroy psych safety in the morning.” Her teammate replied: “Just testing your resilience.”

“That could have been the wrong thing to say to someone else, but he knew it was exactly what I needed to hear,” Rozovsky said. “With one 30-second interaction, we defused the tension.” She wanted to be listened to. She wanted her teammate to be sensitive to what she was feeling. “And I had research telling me that it was O.K. to follow my gut,” she said. “So that’s what I did. The data helped me feel safe enough to do what I thought was right.”