

All Together Now

Harvard Business School's Linda A. Hill explains how to unleash an organization's collective genius and innovation

Interview by Gareth Cook

What allows a creative enterprise—a film studio, a design firm, a start-up—to flourish? It's an old question but one that has become increasingly relevant as we transition to an economy built on the exchange of knowledge and information. Linda A. Hill, a professor of business administration at Harvard Business School, has studied how creative teams come together and how certain leadership qualities build these collectives. Recently Hill pooled her knowledge with colleagues from Pixar, the Massachusetts Institute of Technology and other institutions to co-author *Collective Genius*, which offers insight into innovative groups. In an interview with *Scientific American Mind* contributing editor Gareth Cook, Hill describes how certain key principles, such as embracing debate, open-minded leadership and active experimentation, can allow creative organizations to thrive.

FAST FACTS

IN CREATIVE COMPANY

- 1 Three factors appear to aid organizations in finding novel solutions: creative abrasion, creative agility and creative resolution.
- 2 These strategies allow people to pursue multiple ideas and to test them against one another in ways that encourage further experimentation, debate and problem solving.
- 3 This approach requires a leader who is flexible and open-minded, finding ways to recombine different solutions as opposed to simply selecting one over another.

SCIENTIFIC AMERICAN MIND: In your research, you and your colleagues have identified three abilities that truly innovative organizations share. Can you describe each?

HILL: Whether we were looking at an Islamic bank in Dubai, a luxury goods retailer in Korea or the global marketing division of a German automaker, my co-authors and I found that innovative organizations are communities that have mastered three capabilities critical to innovation: creative abrasion, creative agility and creative resolution.

Creative abrasion refers to the ability to generate a marketplace of ideas through discourse and debate. Innovative organizations know how to amplify rather than minimize differences. We're not just talking about brainstorming,

Photography by Jared Leeds



which asks people to suspend their judgment and to share their ideas no matter how “off the wall” or “half-baked.” Creative abrasion is about having heated yet healthy arguments to generate a portfolio of alternatives. People in innovative organizations have learned how to inquire, actively listen and advocate for their point of view. They understand that you rarely get innovation without diversity of thought and conflict.

Creative agility is the ability to test and refine ideas through quick pursuit, reflection and adjustment. It is about knowing how to do the kind of discovery-driven learning used by scientists and designers, for example, to solve problems—an interesting mix of the scientific method and the artistic process. Creative agility is about acting your way, as opposed to planning your way, to a solution. One could think of it as running a series of experiments, not pilot studies. In research, pilot studies are often about being right—when they don’t work, something or someone is to blame. Experiments, in contrast, are about learning—and a negative outcome can provide important insights.

The third capability, creative resolution, is the ability to do integrative decision making so that diverse ideas, even opposable ones, can be combined or reconfigured to create a new solution. In innovative organizations, people are not willing to go along to get along. They do not allow one individual or group to dominate—not the bosses, not the experts. They do not compromise or take the path of least resistance. This approach allows leaders to combine multiple ideas as opposed to selecting only one option.

How does a group put these principles into practice? And how does a leader participate in this process?

Think about what it takes to create a film at Pixar. No solitary genius, no flash of inspiration, produces these movies. It takes about 250 people working diligently for four to five years to make one film.

Throughout the making of a Pixar film, the story evolves. Different shots move through the production pipeline at different speeds and not in order. Some scenes take months or longer because they represent unprecedented artistic or technical challenges. Ten seconds of film (such as in the movie *Up* when the boy hands the chocolate to the big bird) can take even the most gifted animator six months to perfect.

In addition, at Pixar no part of a movie is considered fin-

ished until the entire movie is done. Halfway through the making of one movie, an animator gave a character a slightly arched eyebrow, suggesting a mischievous side. The director saw this moment in a daily review of the work in progress and said, “No, no. That’s out of character. Nicely done, but lose it.”

A few weeks later the director came back with a different reaction. He’d been thinking about those few seconds of film and concluded they should put it in. Because an animator added his personal take—what we call his “slice of genius”—the director was able to reconceive the character in a subtle but important way and improve the story.

This is an example of the power of collaboration and creative resolution. The director combined ideas instead of seeing one idea as right and another as wrong.



Great innovation leaders see their role not as visionaries but as social architects. Their job is to set the stage, not to perform on it.

The unavoidable paradox at the heart of innovation is the need to unleash the talents of individuals and harness those talents in the form of a solution that is useful to the organization. Creative workers need a leader who understands the power of collaboration, someone who will create an environment in which everyone is willing and able to share and refine ideas together. Innovation is a journey, a collaborative problem-solving process—most often among people with diverse perspectives and expertise.

That example illustrates creative resolution in action, showing how a leader integrates different visions. Can you give an example of creative abrasion and creative agility in context?

The infrastructure group at Google is the group responsible for keeping Google’s search engine and applications up and running 24/7. You can imagine what a wicked set of problems that presents.

When Google was preparing to introduce Gmail and integrate YouTube, they knew their data storage system at the time was inadequate. Bill Coughran (then senior vice president of engineering) and the infrastructure group were charged with tackling this mission-critical task.

THE AUTHOR

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Instead of picking a team, Bill elected to let small project teams emerge and organize “spontaneously around different solutions,” as he puts it. Two separate groups soon coalesced around promising alternatives. One group, Big Table, proposed an evolutionary approach building on the current system. The other, Build It from Scratch, thought it was time to build a brand-new system.

Separately, both teams were allowed to work full-time on their ideas. Even with everyone working at breakneck speeds, the process took two years. In periodic engineering reviews, Bill and his leadership team worked to “drive debate” and “inject honesty” (to use their words) into each team’s thinking. This is creative abrasion. The friction created as people present, defend and critique ideas propels the project forward.

Both teams were encouraged to build prototypes so they could bump up against reality and discover for themselves the pluses and minuses of their proposed solutions. The Build It from Scratch team shared their prototype with the operations group whose beepers would go off in the middle of the night if a problem arose with the Web site. They heard loud and clear about the limitations of their design. In other words, they used creative agility, actively testing ideas to assess each approach.

As the evidence came in, it became clear that the Big Table system was the better alternative for the time being—frankly, the need for a solution was becoming urgent. But to ensure that the knowledge gained by the Build It from Scratch team was retained, Bill asked members of that team to join a new team that was emerging to take on the next big infrastructure challenge.

Putting these principles into practice and running parallel experiments may seem inefficient. By the end of the process at Google, one engineer who was initially skeptical told us that he saw the wisdom of letting smart people play out their particular passions. If people had been forced onto one big team, their focus might have been about winning and proving whose solution was right rather than learning and discovering the best solution.

Bill at Google and the leaders at Pixar all understood that most innovations are the result of bottom-up, not top-down initiatives [projects that are not dictated by management]. As Bill told us, “Talented, passionate people don’t want to follow you to create a better future; they want to co-create it with you.” So he intervened in a top-down way only when necessary. He explained to us that finding the right balance between patience and urgency wasn’t easy. His dilemma was to give the two teams the time they needed to develop and test their ideas, all the while urging them forward as quickly as possible to meet Google’s bold ambitions and pressing needs.

What do you think are the biggest misunderstandings that people have about what it takes to lead a creative effort?

Many people believe in the myth that innovation happens when a solo genius has an aha! moment, but that is usually not

the way. In fact, most innovations happen through collaboration, with many false starts and missteps along the way. Often innovations result from combinations of many ideas, even old ideas being combined in new ways or being applied to new circumstances.

Think about it this way: when we are trying to do something truly new—when we are far out on the cutting edge—we cannot know, by definition, where to go or maybe even how to get there. Instead we have to act and learn our way forward, to discover what that new future is going to be.

Great innovation leaders see their role not as visionaries but as social architects. This does not mean they lack vision. To the contrary, many are quite visionary. But because they understand how innovation really happens, they reject that leadership ideal. They understand that their job is to set the stage, not to perform on it.

You have written and lectured extensively on the need for strong leadership and its connection to creativity. Why is this so important?

I became a professor of business because without economic development, none of us can have the livelihoods or lives to which we aspire. And I became interested in innovation, in part, because we have so many complex problems and opportunities out there in the world, both in business and in society at large, that need innovative solutions.

We need a lot of new thinking and new ways of doing things to address them. That is why I am interested in business and, particularly, in what leaders of businesses do that makes the difference. If we can build organizations that are willing and able to innovate time and again, then I believe that we can create better societies. That is what drives me personally. **M**



Each week in Mind Matters, www.ScientificAmerican.com/mind-matters, researchers explain their disciplines' most notable recent findings. Mind Matters is edited by Gareth Cook, a Pulitzer Prize-winning journalist in Boston.

FURTHER READING

- **Motivation through the Design of Work: Test of a Theory.** J. Richard Hackman and Greg R. Oldham in *Organizational Behavior and Human Performance*, Vol. 16, No. 2, pages 250–279; August 1976.
 - **Idea Generation in Groups: A Basis for Creativity in Organizations.** Paul B. Paulus and Huei-Chuan Yang in *Organizational Behavior and Human Decision Processes*, Vol. 82, No. 1, pages 76–87; May 2000.
 - **Collective Genius: The Art and Practice of Leading Innovation.** Linda A. Hill, Greg Brandeau, Emily Truelove and Kent Lineback. Harvard Business Review Press, 2014.
- From Our Archives*
- **Your Creative Brain at Work.** Evangelia G. Chrysikou; July/August 2012.
 - **The Aha! Moment.** Nessa Victoria Bryce; July/August 2014.
 - **Creativity Is Collective.** S. Alexander Haslam, Inmaculada Adarves-Yorno and Tom Postmes; July/August 2014.