

Prologue

HOW DIVERSITY TRUMPS ABILITY: FUN AT CALTECH

Oh do not ask what is it. Let us go and make our visit.

—T. S. Eliot

IN 1993, I got my first real job, as an assistant professor of economics at the California Institute of Technology in Pasadena, California, home of the Tournament of Roses. I lived one block from campus and one and a half blocks from the Caltech gym. I wore shorts to work every day—even when temperatures fell into the sixties. Apart from being hit in the head by a falling palm frond during a spell of Santa Ana winds, I had a wonderful time. Caltech offered me abundant resources and an environment that encouraged freewheeling exploration.

One winter evening in 1995, to have a little fun I constructed a computer model of diverse problem solvers confronting a difficult problem. Put aside for now what counts for fun at Caltech; “fun” at Caltech rarely makes sense to the outside world. In my model, I represented diversity as differences in the ways problem solvers encoded the problem and searched for solutions. I referred to these ways of solving the problem as tools. In working through the implications of my model, I stumbled on a counterintuitive finding: diverse groups of problem solvers—groups of people with diverse tools—consistently outperformed groups of the best and the brightest. If I formed two groups, one random (and therefore diverse) and one consisting of the best individual performers, the first group almost always did better. In my model, *diversity trumped ability*.

This result proved to be no house of cards. With the help of my good friend and coauthor Lu Hong, I unpacked a logic that underpins that finding. In doing so, Lu and I hit on a fundamental insight: *in problem solving, diversity is powerful stuff*. It doesn’t always trump ability, but it does so far more often than we’d expect. The power of diversity is not a new idea. (Evolutionary biologists see the selection of fortuitous diversity as the reason we’re here. What could be more powerful than that?) However, as became clear to Lu and me, the idea that our individual differences—the differences in how we think, in the cognitive tools we possess, in our perspectives—was far outside the mainstream in a society that prizes individual talent and achievement. It shouldn’t be. Progress depends as much on our collective differences as it does on our individual IQ scores.

The claim that diversity should get equal billing with ability is a strong and controversial one. Anecdotes, metaphors, and decorative quotes won’t be sufficient to convince skeptics. Hence, in this book, I make the case using frameworks and models. I show with modest rigor how diverse perspectives, heuristics, interpretations, and mental models improve our collective ability to solve problems and make accurate predictions. An advantage of using logic is that it gives conditions—these results hold when and if the following are true. Another advantage is that it provides the greatest chance of getting hit on the head by a palm frond (just a conceptual one). Models and logic don’t come without some costs. They limit what we can claim. We’re tied to the mast of our assumptions. They also require careful reading. Don’t worry, though; the book doesn’t read like that undergraduate economics textbook you resold for ten cents on the dollar. It’s fun.

This book can be read from multiple perspectives. Parts of this book have strong connections to two recent books on collective wisdom. The first is Howard Reingold’s

Smart Mobs, which describes how emergent collections of people can carry out tasks and can solve problems.¹ The second book is Jim Surowiecki's *Wisdom of Crowds*, which shows how crowds of people can make accurate predictions.² The words *crowds* and *mobs* are a bit misleading, as these intuitions apply to groups of ten as well as groups of a thousand. A board of directors is not a mob or a crowd, but it too benefits from diversity.

In this book, I also consider a third benefit of diversity: the increased probability of a savant. If we sample widely, we're more likely to find the one person who can solve the problem or who can make the key breakthrough. We did not get the theory of relatively from a crowd. We got it from a diverse, novel thinker in a patent office.

This book also has bearing on claims of the legal, instrumentalist benefits of identity diversity arguments. For a long time, my research papers and presentations included no mention of identity diversity. They considered only the differences inside people's heads, not differences in skin color, gender, or ethnicity. Yet, audiences continued to make a connection between cognitive differences (who we are inside our heads) and identity differences (who we are on the outside). Although promoting greater identity diversity in groups—particularly in groups that possess power—has long been the concern of the political left (usually for reasons of justice and fairness), the people who brought up this connection more often than not came from the corporate sector.

This reaction did not surprise me. Though the business world's concern is, and always has been, with the bottom line (we don't see many business leaders chanting "a people united will never be defeated" or anything of the sort), over the past few decades business leaders have moved in the direction of pro-diversity. Two fundamental changes have led to this directional shift: the business world has become more global (and therefore more aware of ethnic diversity) and the practice of work has become more team focused. The homogenous hierarchy has given way to the diverse team.³ To paraphrase one business executive, "Look, companies spend billions of dollars each year trying to manage diverse employees. That's not going to change."⁴ Some people dismiss claims that diversity is beneficial as empty rhetoric. And people have good reason to be dubious. These claims do not seem to be based on anything more than hope and metaphor (making them easy to dismiss). This book provides a foundation for those claims. Identity diversity does produce benefits—not every time, not in every context—but there is a there there.⁵

This book also provides a logic for greater interdisciplinary research. What, after all, are the different disciplines but collections of different sets of tools and understandings? That said, at the end of the day this book has to be a contribution to social science. That's the job of the social scientist—to add to the base of knowledge.

This book contributes to social science by unpacking the processes of problem solving and prediction, processes that social scientists often ignore or "black box." Two examples help to clarify what I mean. First, most social science models rarely differentiate among problem solving (curing a disease), prediction (estimating the outcome of the next election), and information aggregation (surveying people to find the grocer with the lowest prices). Even though these tasks differ, many economists would respond (perhaps correctly), "Yeah, yeah, yeah, it's all basically information aggregation. People have different information and the noise cancels." Second, many political science models in effect assume that information arrives on people's doorsteps in the form of *signals*. The story goes as follows: the president proposes a tax policy, a voter wakes up and finds a placard that reads "new policy to lead to a 3% increase in economic growth" on her doorstep the next morning. Moreover, each voter gets a *unique* placard and *on average* those placards are correct. But why are they correct? That is what I unpack.

In what follows I nourish these diverse readings. When possible, I point out the linkages to smart mobs, to wise crowds, to identity diversity, to globalization, and to interdisciplinary science. I do this not just to try to make everyone happy, but because the same logic that shows how cognitive diversity improves the performance of a predictive market can show how including identity diverse—and experientially and vocationally diverse—people improves the performance of a problem-solving team. To quote Dan Ackroyd from his *Saturday Night Live* days, “It’s a floor wax *and* a dessert topping.”

Before starting, I will put what follows in some context by returning to the original finding that diversity trumps ability. Does this logic imply that we should abandon the meritocracy? That we should remove those “my child is an honor student at Neil Armstrong Junior High” bumper stickers from our minivans and randomly allocate spots in our top colleges? Of course not. Ability matters. But—here’s the catch—so does diversity. Comparisons between the two (which matters more: diversity or ability?) require some care. We’re comparing an apple to a fruit basket. Ability is a property of an individual—a nice shiny apple. Neither a person nor an apple can be diverse. Diversity is a property of a collection of people—a basket with many kinds of fruit. Diversity and ability complement one another: the better the individual fruits, the better the fruit basket, and the better the other fruit, the better the apple. So while we might equally proudly affix “my other child’s different” bumper stickers to our vehicles (anyone with two kids can claim that to be true), ideally, our children would be individually able *and* collectively diverse. If so, what they could accomplish would amaze us.

In sum, rather than being on the defensive about diversity, we should go on the offensive. We should look at difference as something that can improve performance, not as something that we have to be concerned about so that we don’t get sued. We should encourage people to think differently. Markets create incentives to be different as well as to be able, but perhaps not to the appropriate levels. We should do more.

Of course, difference does not magically translate into benefits. My claims that diversity produces benefits rest on conditions. These conditions require, among other things, that diversity is relevant—we cannot expect that adding a poet to a medical research team would enable them to find a cure for the common cold. Further, for diverse groups to function in practice, the people in them must get along. If not, the cognitive differences between them may be little more than disconnected silos of ideas and thoughts. Diversity, like everything else (excepting, of course, moderation), has its limits.

Understanding diversity and leveraging its potential requires a deeper understanding than we currently possess. We won’t get far with compelling anecdotes and metaphors, which in the diversity realm exist in abundance. We have (as Kermit would say) “so many songs about rainbows and what’s on the other side.” What we need are formal definitions, assumptions, and claims. We need theorems about rainbows. We need a logic of diversity. This book provides that logic—not all of it, but enough to get us started. I’ll end with this observation: as individuals we can accomplish only so much. We’re limited in our abilities. Our heads contain only so many neurons and axons. Collectively, we face no such constraint. We possess incredible capacity to think differently. These differences can provide the seeds of innovation, progress, and understanding.