

OUTLIERS

The Story of Success

MALCOLM GLADWELL



LITTLE, BROWN AND COMPANY
NEW YORK • BOSTON • LONDON

CHAPTER THREE

The Trouble with Geniuses, Part 1

“KNOWLEDGE OF A BOY’S IQ IS OF
LITTLE HELP IF YOU ARE FACED WITH
A FORMFUL OF CLEVER BOYS.”

1.

In the fifth episode of the 2008 season, the American television quiz show *1 vs. 100* had as its special guest a man named Christopher Langan.

The television show *1 vs. 100* is one of many that sprang up in the wake of the phenomenal success of *Who Wants to Be a Millionaire*. It features a permanent gallery of one hundred ordinary people who serve as what is called the “mob.” Each week they match wits with a special invited guest. At stake is a million dollars. The guest has to be smart enough to answer more questions correctly than his or her one hundred adversaries—and by that standard, few have ever seemed as superbly qualified as Christopher Langan.

“Tonight the mob takes on their fiercest competition yet,” the voice-over began. “Meet Chris Langan, who many

call the smartest man in America." The camera did a slow pan of a stocky, muscular man in his fifties. "The average person has an IQ of one hundred," the voice-over continued. "Einstein one fifty. Chris has an IQ of one ninety-five. He's currently wrapping his big brain around a theory of the universe. But will his king-size cranium be enough to take down the mob for one million dollars? Find out right now on *One versus One Hundred*."

Out strode Langan onto the stage amid wild applause.

"You don't think you need to have a high intellect to do well on *One versus One Hundred*, do you?" the show's host, Bob Saget, asked him. Saget looked at Langan oddly, as if he were some kind of laboratory specimen.

"Actually, I think it could be a hindrance," Langan replied. He had a deep, certain voice. "To have a high IQ, you tend to specialize, think deep thoughts. You avoid trivia. But now that I see these people"—he glanced at the mob, the amusement in his eyes betraying just how ridiculous he found the proceedings—"I think I'll do okay."

Over the past decade, Chris Langan has achieved a strange kind of fame. He has become the public face of genius in American life, a celebrity outlier. He gets invited on news shows and profiled in magazines, and he has been the subject of a documentary by the filmmaker Errol Morris, all because of a brain that appears to defy description.

The television news show *20/20* once hired a neuropsychologist to give Langan an IQ test, and Langan's score was literally off the charts—too high to be accurately measured. Another time, Langan took an IQ test specially designed for people too smart for ordinary IQ tests. He

got all the questions right except one.* He was speaking at six months of age. When he was three, he would listen to the radio on Sundays as the announcer read the comics aloud, and he would follow along on his own until he had taught himself to read. At five, he began questioning his grandfather about the existence of God—and remembers being disappointed in the answers he got.

In school, Langan could walk into a test in a foreign-language class, not having studied at all, and if there were two or three minutes before the instructor arrived, he could skim through the textbook and ace the test. In his early teenage years, while working as a farmhand, he started to read widely in the area of theoretical physics. At sixteen, he made his way through Bertrand Russell and Alfred North Whitehead's famously abstruse masterpiece *Principia Mathematica*. He got a perfect score on his SAT, even though he fell asleep at one point during the test.

"He did math for an hour," his brother Mark says of Langan's summer routine in high school. "Then he did French for an hour. Then he studied Russian. Then he would read philosophy. He did that religiously, every day."

Another of his brothers, Jeff, says, "You know, when Christopher was fourteen or fifteen, he would draw things just as a joke, and it would be like a photograph. When he was fifteen, he could match Jimi Hendrix lick for lick on a guitar. Boom. Boom. Boom. Half the time, Christopher didn't attend school at all. He would just show up for tests

* The super IQ test was created by Ronald K. Hoeflin, who is himself someone with an unusually high IQ. Here's a sample question, from the verbal analogies section. "Teeth is to Hen as Nest is to ?" If you want to know the answer, I'm afraid I have no idea.

and there was nothing they could do about it. To us, it was hilarious. He could brief a semester's worth of textbooks in two days, and take care of whatever he had to take care of, and then get back to whatever he was doing in the first place."*

On the set of *1 vs. 100*, Langan was poised and confident. His voice was deep. His eyes were small and fiercely bright. He did not circle about topics, searching for the right phrase, or double back to restate a previous sentence.

* To get a sense of what Chris Langan must have been like growing up, consider the following description of a child named "L," who had an IQ in the same 200 range as Langan's. It's from a study by Leta Stetter Hollingworth, who was one of the first psychologists to study exceptionally gifted children. As the description makes obvious, an IQ of 200 is really, really high: "Young L's erudition was astonishing. His passion for scholarly accuracy and thoroughness set a high standard for accomplishment. He was relatively large, robust and impressive, and was fondly dubbed 'Professor.' His attitudes and abilities were appreciated by both pupils and teachers. He was often allowed to lecture (for as long as an hour) on some special topic, such as the history of timepieces, ancient theories of engine construction, mathematics, and history. He constructed out of odds and ends (typewriter ribbon spools, for example) a homemade clock of the pendular type to illustrate some of the principles of chronometry, and this clock was set up before the class during the enrichment unit on 'Time and Time Keeping' to demonstrate some of the principles of chronometry. His notebooks were marvels of scholarly exposition.

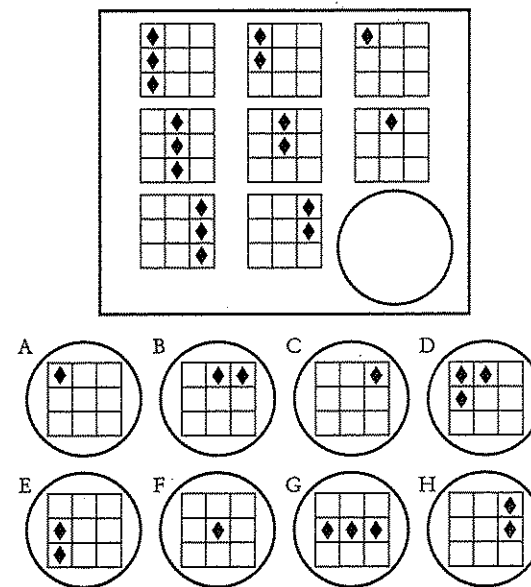
"Being discontented with what he considered the inadequate treatment of land travel in a class unit on 'Transportation,' he agreed that time was too limited to do justice to everything. But he insisted that 'at least they should have covered ancient theory.' As an extra and voluntary project, 'he brought in elaborate drawings and accounts of the ancient theories of engines, locomotives etc.'... He was at that time 10 years of age."

For that matter, he did not say um, or ah, or use any form of conversational mitigation: his sentences came marching out, one after another, polished and crisp, like soldiers on a parade ground. Every question Saget threw at him, he tossed aside, as if it were a triviality. When his winnings reached \$250,000, he appeared to make a mental calculation that the risks of losing everything were at that point greater than the potential benefits of staying in. Abruptly, he stopped. "I'll take the cash," he said. He shook Saget's hand firmly and was finished—exiting on top as, we like to think, geniuses invariably do.

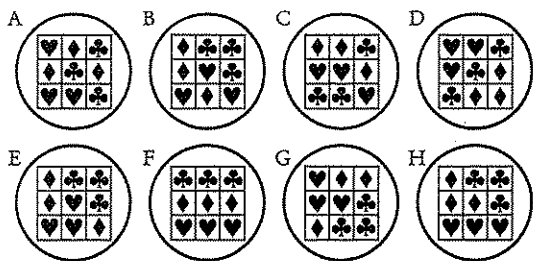
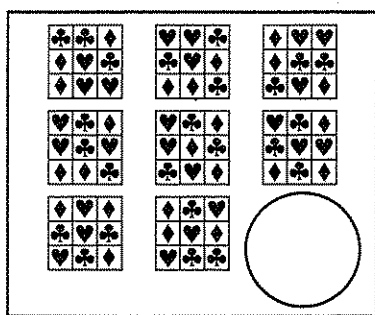
3.

One of the most widely used intelligence tests is something called Raven's Progressive Matrices. It requires no language skills or specific body of acquired knowledge. It's a measure of abstract reasoning skills. A typical Raven's test consists of forty-eight items, each one harder than the one before it, and IQ is calculated based on how many items are answered correctly.

Here's a question, typical of the sort that is asked on the Raven's.



Did you get that? I'm guessing most of you did. The correct answer is C. But now try this one. It's the kind of really hard question that comes at the end of the Raven's.



The correct answer is A. I have to confess I couldn't figure this one out, and I'm guessing most of you couldn't either. Chris Langan almost certainly could, however. When we say that people like Langan are really brilliant, what we mean is that they have the kind of mind that can figure out puzzles like that last question.

Over the years, an enormous amount of research has been done in an attempt to determine how a person's performance on an IQ test like the Raven's translates to real-life success. People at the bottom of the scale—with an IQ below 70—are considered mentally disabled. A score

of 100 is average; you probably need to be just above that mark to be able to handle college. To get into and succeed in a reasonably competitive graduate program, meanwhile, you probably need an IQ of at least 115. In general, the higher your score, the more education you'll get, the more money you're likely to make, and—believe it or not—the longer you'll live.

But there's a catch. The relationship between success and IQ works only up to a point. Once someone has reached an IQ of somewhere around 120, having additional IQ points doesn't seem to translate into any measurable real-world advantage.*

"It is amply proved that someone with an IQ of 170 is more likely to think well than someone whose IQ is 70," the

* The "IQ fundamentalist" Arthur Jensen put it thusly in his 1980 book *Bias in Mental Testing* (p. 113): "The four socially and personally most important threshold regions on the IQ scale are those that differentiate with high probability between persons who, because of their level of general mental ability, can or cannot attend a regular school (about IQ 50), can or cannot master the traditional subject matter of elementary school (about IQ 75), can or cannot succeed in the academic or college preparatory curriculum through high school (about IQ 105), can or cannot graduate from an accredited four-year college with grades that would qualify for admission to a professional or graduate school (about IQ 115). Beyond this, the IQ level becomes relatively unimportant in terms of ordinary occupational aspirations and criteria of success. That is not to say that there are not real differences between the intellectual capabilities represented by IQs of 115 and 150 or even between IQs of 150 and 180. But IQ differences in this upper part of the scale have far less personal implications than the thresholds just described and are generally of lesser importance for success in the popular sense than are certain traits of personality and character."

British psychologist Liam Hudson has written, “and this holds true where the comparison is much closer—between IQs of, say, 100 and 130. But the relation seems to break down when one is making comparisons between two people both of whom have IQs which are relatively high.... A mature scientist with an adult IQ of 130 is as likely to win a Nobel Prize as is one whose IQ is 180.”

What Hudson is saying is that IQ is a lot like height in basketball. Does someone who is five foot six have a realistic chance of playing professional basketball? Not really. You need to be at least six foot or six one to play at that level, and, all things being equal, it's probably better to be six two than six one, and better to be six three than six two. But past a certain point, height stops mattering so much. A player who is six foot eight is not automatically better than someone two inches shorter. (Michael Jordan, the greatest player ever, was six six after all.) A basketball player only has to be tall *enough*—and the same is true of intelligence. Intelligence has a threshold.

The introduction to the *1 vs. 100* episode pointed out that Einstein had an IQ of 150 and Langan has an IQ of 195. Langan's IQ is 30 percent higher than Einstein's. But that doesn't mean Langan is 30 percent *smarter* than Einstein. That's ridiculous. All we can say is that when it comes to thinking about really hard things like physics, they are both clearly smart *enough*.

The idea that IQ has a threshold, I realize, goes against our intuition. We think that, say, Nobel Prize winners in science must have the highest IQ scores imaginable; that they must be the kinds of people who got perfect scores on their entrance examinations to college, won every scholar-

ship available, and had such stellar academic records in high school that they were scooped up by the top universities in the country.

But take a look at the following list of where the last twenty-five Americans to win the Nobel Prize in Medicine got their undergraduate degrees, starting in 2007.

Antioch College
Brown University
UC Berkeley
University of Washington
Columbia University
Case Institute of Technology
MIT
Caltech
Harvard University
Hamilton College
Columbia University
University of North Carolina
DePauw University
University of Pennsylvania
University of Minnesota
University of Notre Dame
Johns Hopkins University
Yale University
Union College, Kentucky
University of Illinois
University of Texas
Holy Cross
Amherst College
Gettysburg College
Hunter College

No one would say that this list represents the college choices of the absolute best high school students in America. Yale and Columbia and MIT are on the list, but so are DePauw, Holy Cross, and Gettysburg College. It's a list of *good* schools.

Along the same lines, here are the colleges of the last twenty-five American Nobel laureates in Chemistry:

City College of New York
 City College of New York
 Stanford University
 University of Dayton, Ohio
 Rollins College, Florida
 MIT
 Grinnell College
 MIT
 McGill University
 Georgia Institute of Technology
 Ohio Wesleyan University
 Rice University
 Hope College
 Brigham Young University
 University of Toronto
 University of Nebraska
 Dartmouth College
 Harvard University
 Berea College
 Augsburg College
 University of Massachusetts
 Washington State University
 University of Florida

University of California, Riverside
 Harvard University

To be a Nobel Prize winner, apparently, you have to be smart enough to get into a college at least as good as Notre Dame or the University of Illinois. That's all.*

This is a radical idea, isn't it? Suppose that your teenage daughter found out that she had been accepted at two universities—Harvard University and Georgetown University, in Washington, DC. Where would you want her to go? I'm guessing Harvard, because Harvard is a "better" school. Its students score a good 10 to 15 percent higher on their entrance exams.

But given what we are learning about intelligence, the idea that schools can be ranked, like runners in a race, makes no sense. Georgetown's students may not be as smart on an absolute scale as the students of Harvard. But they are all, clearly, smart enough, and future Nobel Prize winners come from schools like Georgetown as well as from schools like Harvard.

The psychologist Barry Schwartz recently proposed that elite schools give up their complex admissions process and simply hold a lottery for everyone above the

* Just to be clear: it is still the case that Harvard produces more Nobel Prize winners than any other school. Just look at those lists. Harvard appears on both of them, a total of three times. A school like Holy Cross appears just once. But wouldn't you expect schools like Harvard to win more Nobels than they do? Harvard is, after all, the richest, most prestigious school in history and has its pick of the most brilliant undergraduates the world over.

threshold. "Put people into two categories," Schwartz says. "Good enough and not good enough. The ones who are good enough get put into a hat. And those who are not good enough get rejected." Schwartz concedes that his idea has virtually no chance of being accepted. But he's absolutely right. As Hudson writes (and keep in mind that he did his research at elite all-male English boarding schools in the 1950s and 1960s), "Knowledge of a boy's IQ is of little help *if you are faced with a formful of clever boys.*"*

Let me give you an example of the threshold effect in action. The University of Michigan law school, like many elite US educational institutions, uses a policy of affirmative action when it comes to applicants from disadvantaged backgrounds. Around 10 percent of the students Michigan enrolls each fall are members of racial minorities, and if the law school did not significantly relax its entry requirements for those students—admitting them with lower undergraduate grades and lower standardized-test scores than everyone else—it estimates that percentage would be less than 3 percent. Furthermore, if we compare the grades that the minority and nonminority students get in

* To get a sense of how absurd the selection process at elite Ivy League schools has become, consider the following statistics. In 2008, 27,462 of the most highly qualified high school seniors in the world applied to Harvard University. Of these students, 2,500 of them scored a perfect 800 on the SAT critical reading test and 3,300 had a perfect score on the SAT math exam. More than 3,300 were ranked first in their high school class. How many did Harvard accept? About 1,600, which is to say they rejected 93 out of every 100 applicants. Is it really possible to say that one student is Harvard material and another isn't, when both have identical—and perfect—academic records? Of course not. Harvard is being dishonest. Schwartz is right. They should just have a lottery.

law school, we see that the white students do better. That's not surprising: if one group has higher undergraduate grades and test scores than the other, it's almost certainly going to have higher grades in law school as well. This is one reason that affirmative action programs are so controversial. In fact, an attack on the University of Michigan's affirmative action program recently went all the way to the US Supreme Court. For many people it is troubling that an elite educational institution lets in students who are less qualified than their peers.

A few years ago, however, the University of Michigan decided to look closely at how the law school's minority students had fared after they graduated. How much money did they make? How far up in the profession did they go? How satisfied were they with their careers? What kind of social and community contributions did they make? What kind of honors had they won? They looked at everything that could conceivably be an indication of real-world success. And what they found surprised them.

"We knew that our minority students, a lot of them, were doing well," says Richard Lempert, one of the authors of the Michigan study. "I think our expectation was that we would find a half- or two-thirds-full glass, that they had not done as well as the white students but nonetheless a lot were quite successful. But we were completely surprised. We found that they were doing every bit as well. There was no place we saw any serious discrepancy."

What Lempert is saying is that by the only measure that a law school really ought to care about—how well its graduates do in the real world—minority students aren't less qualified. They're just as successful as white students.

And why? Because even though the academic credentials of minority students at Michigan aren't as good as those of white students, the quality of students at the law school is high enough that *they're still above the threshold*. They are smart enough. Knowledge of a law student's test scores is of little help if you are faced with a classroom of clever law students.

4.

Let's take the threshold idea one step further. If intelligence matters only up to a point, then past that point, other things—things that have nothing to do with intelligence—must start to matter more. It's like basketball again: once someone is tall enough, then we start to care about speed and court sense and agility and ball-handling skills and shooting touch.

So, what might some of those other things be? Well, suppose that instead of measuring your IQ, I gave you a totally different kind of test.

Write down as many different uses that you can think of for the following objects:

1. a brick
2. a blanket

This is an example of what's called a "divergence test" (as opposed to a test like the Raven's, which asks you to sort through a list of possibilities and *converge* on the right answer). It requires you to use your imagination and

take your mind in as many different directions as possible. With a divergence test, obviously there isn't a single right answer. What the test giver is looking for are the number and the uniqueness of your responses. And what the test is measuring isn't analytical intelligence but something profoundly different—something much closer to creativity. Divergence tests are every bit as challenging as convergence tests, and if you don't believe that, I encourage you to pause and try the brick-and-blanket test right now.

Here, for example, are answers to the "uses of objects" test collected by Liam Hudson from a student named Poole at a top British high school:

(Brick). To use in smash-and-grab raids. To help hold a house together. To use in a game of Russian roulette if you want to keep fit at the same time (bricks at ten paces, turn and throw—no evasive action allowed). To hold the eiderdown on a bed tie a brick at each corner. As a breaker of empty Coca-Cola bottles.

(Blanket). To use on a bed. As a cover for illicit sex in the woods. As a tent. To make smoke signals with. As a sail for a boat, cart or sled. As a substitute for a towel. As a target for shooting practice for short-sighted people. As a thing to catch people jumping out of burning skyscrapers.

It's not hard to read Poole's answers and get some sense of how his mind works. He's funny. He's a little subversive and libidinous. He has the flair for the dramatic. His mind leaps from violent imagery to sex to people jumping out of burning skyscrapers to very practical issues, such as how

to get a duvet to stay on a bed. He gives us the impression that if we gave him another ten minutes, he'd come up with another twenty uses.*

Now, for the sake of comparison, consider the answers of another student from Hudson's sample. His name is Florence. Hudson tells us that Florence is a prodigy, with one of the highest IQs in his school.

(Brick). Building things, throwing.

(Blanket). Keeping warm, smothering fire, tying to trees and sleeping in (as a hammock), improvised stretcher.

Where is Florence's imagination? He identified the most common and most functional uses for bricks and blankets and simply stopped. Florence's IQ is higher than Poole's. But that means little, since both students are above the threshold. What is more interesting is that Poole's mind can leap from violent imagery to sex to people jumping out of buildings without missing a beat, and Florence's mind can't. Now which of these two students do you think is better suited to do the kind of brilliant, imaginative work that wins Nobel Prizes?

* Here's another student's answers. These might be even better than Poole's: "(Brick). To break windows for robbery, to determine depth of wells, to use as ammunition, as pendulum, to practice carving, wall building, to demonstrate Archimedes' Principle, as part of abstract sculpture, costh, ballast, weight for dropping things in river, etc., as a hammer, keep door open, footwiper, use as rubble for path filling, chock, weight on scale, to prop up wobbly table, paperweight, as fire-hearth, to block up rabbit hole."

That's the second reason Nobel Prize winners come from Holy Cross as well as Harvard, because Harvard isn't selecting its students on the basis of how well they do on the "uses of a brick" test—and maybe "uses of a brick" is a better predictor of Nobel Prize ability. It's also the second reason Michigan Law School couldn't find a difference between its affirmative action graduates and the rest of its alumni. Being a successful lawyer is about a lot more than IQ. It involves having the kind of fertile mind that Poole had. And just because Michigan's minority students have lower scores on convergence tests doesn't mean they don't have that other critical trait in abundance.