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FEBRUARY/MARCH 2021

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# IQ

# MATTER



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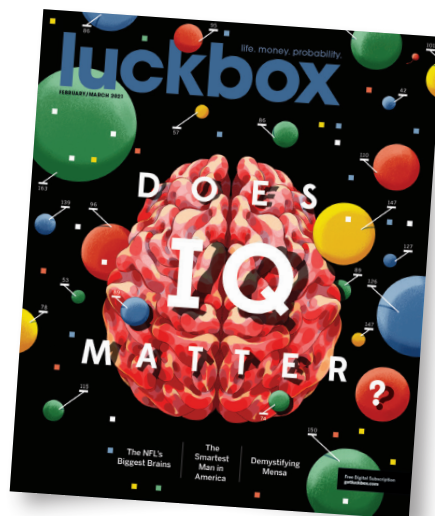
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# THE ISSUE WITH INTELLIGENCE

Welcome to a new kind of tension  
All across the alien nation  
Where everything isn't meant to be OK  
Television dreams of tomorrow  
We're not the ones who're meant to follow  
For that's enough to argue  
Don't want to be an American idiot  
One nation controlled by the media  
Information age of hysteria  
It's going out to idiot America  
—American Idiot, Green Day (2004)



Early last year, an interesting battle of (left) brains played out on the content platform Medium after the revered author Nassim Nicholas Taleb (*Foiled by Randomness, The Black Swan, Antifragile*, et. al.) posted an article entitled “IQ is Largely a Pseudoscientific Swindle.”

Taleb has a famously brilliant mind. In 2006, I met him for coffee in New York right after he completed his manuscript for *The Black Swan*. Suffice it to say that his ego is comparable to his intellect, and he certainly knows how to push buttons.

Taleb's recent harangue on IQ is persuasive. In fact, it was a catalyst for this issue. Essentially, he argued that IQ is “a stale test meant to measure mental capacity but in fact mostly measures extreme unintelligence (learning difficulties) as well as, to a lesser extent (with a lot of noise), a form of intelligence.” He likewise questioned the validity of the statistical dataset on

admittedly controversial national IQs (see pg. 22), and he challenged “the statistical association between IQ and hard measures such as wealth.”

Enter Bruno Campello de Souza, professor of cognitive psychology at the Federal University of Pernambuco in Brazil, who offered up a stirring 19-point rebuttal.

De Souza was convincing in affirming the statistical relevance of IQ, its use as a measure of intelligence and as a meaningfully predictive factor in determining life's ultimate outcomes. But Taleb scored irrefutable points, noting the historical misuse and abuse of IQ by eugenicists and “psychometric peddlers”—labeling IQ “an immoral measure that, while not working, can put people in boxes for the rest of their lives.”

Taleb's passion aside, de Souza is correct in citing “numerous studies showing positive associations between IQ and various measures of socioeconomic success ... income, longevity, procreation, job performance, job advancement, having no criminal record and so forth.”

And de Souza is also correct in asserting that “the fact that racists ... used IQ to pseudo-justify their stances is no more of an argument against IQ than pointing out that Hitler was a vegetarian is an argument against vegetarianism. It is simply an ad hominem fallacy and an appeal to emotion.”

The IQ debate has undeniable political undertones and an entertaining irony. In a culture bookended by the radical extremes of racism and “intersectionality,” one's political partisanship seems to be the primary determinant in deciding which labels and identities are appropriate to consider.

*Luckbox* seeks to sit above the political fray. This issue on IQ ocuses on the value and use of IQ data (and less on the nefarious abuse of such data) as we have considerably more confidence in the reliability of math than mankind.

But, we do love our readers.

**Jeff Joseph**  
editorial director

**Your thoughts on this issue?** Please take the next reader poll at [luckboxmagazine.com/survey](http://luckboxmagazine.com/survey)

## Thinking Inside the Luckbox

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- 2 Greater market volatility** brings greater opportunity for traders and investors.
- 3 Options** are the best vehicle to manage risk and exploit market volatility.
- 4 Don't rely on chance.** Know your options because luck smiles upon the prepared.

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## Luckbox on the Membrane

Luckbox polls readers at luckboxmagazine.com. Here are some recent responses.



The Brain-Computer Interface Race (BCI) at the Cybathlon Championships in Kloten, Switzerland in 2016.

**12.2%**

of Luckbox readers said they would "definitely" link their brain directly to a computer interface via implant if it was proven safe and effective

**43.7%**

said "possibly"

**44.1%**

said "never"

**17%**

of readers said they would use implanted microchips to enhance their cognitive abilities

## Open Outcry

I loved the entire *Art & Science of Prediction* issue. The fun will be seeing which predictions become reality.

—Mitchel Levitt, Columbus, OH

Your predictions are almost like reading the *National Enquirer*. I enjoyed reading that but didn't tell anybody.

—Thomas, Trenton, FL

*National Enquirer*, eh? If you're keeping score, the forecasts in the December article "20 Predictions for '21 and Beyond" are off to an explosive start. Twitter has banned Trump, CRSP stock is up 100%, the U.S dollar is down and Andrew Yang has announced his NYC mayoral run.



IQ tests are only as smart as the people who make them. I like to refer to the quote, "Everybody is a genius. But if you judge a fish by its ability to climb a tree, it will live its whole life believing it is stupid."

—Greg L., Evanston, IL

One does not need to look too far into the past to understand how IQ testing was used in the U.S. to marginalize the poor, immigrants and other disenfranchised populations.

—Kimberly Sinegal-DAngelo, Kirkland, WA

IQ is a very important contributor to success. High IQ leads to higher educational success, scholarships, the ability to more

quickly grasp conceptual ideas and the ability to express yourself in an articulate manner. I spent my professional career as a clinical child psychologist and administered thousands of IQ tests. Lower scores allowed me to advocate for special educational services in school systems and to help parents understand why their children were struggling. Being highly intelligent led to my having a meaningful profession far, far beyond just earning a paycheck.

—Miriam Sexton, Dunedin, FL

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## DOES IQ MATTER?

**47%** of Luckbox readers say they've taken a qualified IQ test  
Source: Luckbox Reader Survey

“IQs like Chris’s exist among us at a rate of roughly one in one hundred million.”

—2007 *Esquire* profile of Christopher Langan

SEE  
PAGE 18

**\$100,000**

Mensa members are more than 3x as likely as other Americans to earn this figure or more annually

“The No. 1 fastest-growing sector in the labor pool, by far, is the service sector. It’s not going to be a computer scientist at Google. It’s not building robots or rockets. It’s cutting hair, it’s serving drinks, it’s waiting tables. ... Those jobs, in and of themselves in our current modern-day economy, probably cannot sustain someone to have the kind of life that they want to live.”

—Fredrik deBoer

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The vertical farming market is projected to reach **\$7.3 billion** by 2025 from \$2.9 billion in 2020 ... primarily attributed to high yield and numerous other benefits associated with vertical farming over conventional farming, advancements in LED technology, year-round crop production irrespective of weather conditions, and requirement of minimum resources.

SEE  
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“Because of the pandemic and the stress, more people than ever are fighting a serious loss of sleep. It’s being called “coronasomnia.” It’s very real and very widespread.”

SEE  
PAGE 31

—UC Davis Health

Source: Vertical Farming Market Global Forecast to 2025, MarketsandMarkets, 2020



# There's More Than One Way To Be Smart

Nature, nurture and emotional intelligence

By Vonetta Logan

If you're a hiring manager, talent scout or just a woman who's dating well into her 30s, you know that sharing, interpreting and regulating emotions doesn't always come naturally. Yes, this issue of *Luckbox* is all about the raw intellectual power of the human brain, but what's the key factor in determining lifelong success—cognitive intelligence (IQ) or emotional intelligence (EQ)? Let's gather our "sharing sticks," sit around the communal feeling circle and delve into our emotions!

If you think EQ is the way to get your bass to "thump" in your hoopy, here's a primer on EQ/EI, colloquially known as emotional intelligence. The phrase refers to a person's ability to perceive, control, evaluate and express emotion. For the longest time, a great scientific debate raged over "nature versus nurture." Put simply, the disagreement centered on whether genes or upbringing determined intelligence. Nerdy McNerdersons were believed to be destined

for greatness. Pass "Go," collect \$200 and head straight to Boardwalk with your second wife.

But the paradigm has started to shift. "Some critics began to realize that high intelligence was no guarantee for success in life," Kendra Cherry says on the Verywell Mind website. "It was also perhaps too narrow a concept to fully encompass the wide range of human abilities and knowledge." In fact, the debate has now shifted to "book smarts" IQ versus "street smarts" EQ.

Think of all the tortured geniuses who are heralded for their greatness but are jerks when you get right down to it. "Cough. Elon Musk. Cough." Not just captains of industry, either, but also artists, writers and musicians blessed with high intelligence are often total nightmares as human beings. Looking at you, Tyson Food managers who started a "COVID death pool" for your employees. Yikes!

Cherry writes that, "since the 1990s, emotional intelligence has gone from a semi-obscure concept found in academic journals to a popularly recognized term. Now you can buy toys that claim to help boost emotional intelligence or enroll kids in social and emotional (SEL) classes designed to teach emotional intelligence skills."

## Building EQ

Unlike traditional measures of intellect, emotional intelligence can be learned, developed and refined. Are you going to suddenly discover a new method of cold

fusion? Nope. Can you learn to regulate your emotions and improve your interactions with other people? You betcha! In its simplest terms, we can all be better at accepting and recognizing our own emotions and understanding how other people feel so we can interact with them more effectively.

Yes, 2020 seemed like the year where whoever typed in all caps the longest won, but in a year that affected people in vastly different ways, it was nice to read that more people Googled "how to help" and "how to be less racist" than "how to become a millionaire."

Maya Angelou once remarked that "people will forget what you said, people will forget what you did, but people will never forget how you made them feel." This is the crux of why calibrating the emotional intelligence of your employees is key to the success of your company. How many times have you had a customer service experience go horribly wrong? How many times has an employee performed so astoundingly well that you're still talking about it?

"One insurance company discovered that EQ could play a vital role in sales success," Cherry writes. "Sales agents who ranked lower on emotional intelligence abilities such as empathy, initiative and self-confidence were found to sell policies with an average premium of \$54,000. Agents who ranked highly on measures of EQ sold policies worth an average of \$114,000."

That goes both ways. I have found that being "Midwest nice" on the phone when I'm having issues with my bank, cable or delivery order gets better results than coming in hot with a "do you know how much money I spend?" Seriously, I get free HBO now. Nobel Prize-winning psychologist Daniel Kahneman found that people would rather deal with a person they like and trust than someone they do not, even if that means paying more for an inferior product.

## Time to reinvent

So it's 2021. New year, new you! Where does one start to become a more self-aware, emotionally intelligent person? To the internet! There's a decent selection of EQ tests online. We have a list of sites on the next page. I took a few tests, and I am happy to report that I have above-average emotional intelligence. Go me! My strengths are that

**What's the key factor in determining lifelong success—cognitive intelligence (IQ) or emotional intelligence (EQ)?**



I'm a positive person who is empathetic, copes well and is socially insightful. Do I sob uncontrollably at videos about animals getting adopted? You bet! But I do it in the privacy of my office. My weaknesses are that I'm not very assertive, my impulse control needs improvement (I once bought a motorcycle on the internet at 2 a.m., and I'm not sorry) and I tend to avoid confrontation.

Those results were from a \$10 test I took on the Psychology Today website. The fee also covers advice on how to work with both your strengths and weaknesses. Another fun test, which is free, is on the website [greatergood.berkeley.edu](http://greatergood.berkeley.edu), and it has a series of photos of people's facial expressions. The goal is to see how perceptive you are in reading expressions. I rocked this and only got two wrong, but it's something you wouldn't think to test. In an increasingly Zoom-filled workplace, being able to identify emotions via facial expressions is a benefit.

The great irony about all of this is that my superior emotional intelligence skills are in service to a company formed by a group of stock and options traders. On a spectrum of EQ with kindergarten teachers on the high end, tastytrade employees are closer to the emotional intelligence of great white sharks. They're superior killing machines but not so good with manners.

Surprisingly, this is a very common disconnect between personal versus organizational EQ. But am I going to bring it up? Nope, I hate confrontation, remember? In a study by Paychex, a payroll services provider, researchers found that "most people perceived emotional intelligence as being less important to their boss and company than it was to them personally." About 43% of respondents rated EQ as extremely important, while only 33.4% thought their boss found it extremely important and 30% thought it was extremely important to their company, the survey said.

Yes, in the dog-eat-dog world of finance, you want decisive, critical problem solvers. But EQ ranked as the sixth most-important skill for employees last year, only a little behind complex problem solving, critical thinking and creativity, according to a *Forbes* magazine article citing research by the World Economic Forum. In contrast, the sixth most-sought-after skill in 2015 was quality control. That might explain why the

customer service from Amazon was so good when they sent me the wrong leopard print bodysuit in the mail.

Anyway, the good news is that EQ scores peak at age 60, according to Robert Levenson, a University of California at Berkeley psychologist. That could explain why older generations (baby boomers and Gen Xers) were more likely than millennials to have emotional intelligence scores above

the median. Nearly 64% of baby boomers surveyed scored above the median, and 60.5% of Gen Xers did.

So please, enjoy this issue on human intelligence, but let us all resolve to be kinder to ourselves and to each other. Let's create a pandemic of emotional intelligence. 📦

**Vonetta Logan**, a writer and comedian, appears daily on the tastytrade network and hosts the *Connect the Dots* podcast. @vonettalogan



### How emotionally intelligent are you?

This test could help you find out.

### What emotion is expressed in this photo?



1. Embarrassment
2. Fear
3. Sadness
4. Surprise

Take the full test to find out at [greatergood.berkeley.edu](http://greatergood.berkeley.edu)

Answer: fear

# 60

Age when emotional intelligence peaks



**Psychology Today EQ Test**  
[psychologytoday.com](http://psychologytoday.com)

**“To invest successfully does not require a stratospheric IQ, unusual business insights or inside information. It takes a sound intellectual framework for making decisions and the ability to keep emotions from corroding the framework.”**

—Warren Buffett in the foreword to Benjamin Graham's *The Intelligent Investor*



# Does IQ Matter?



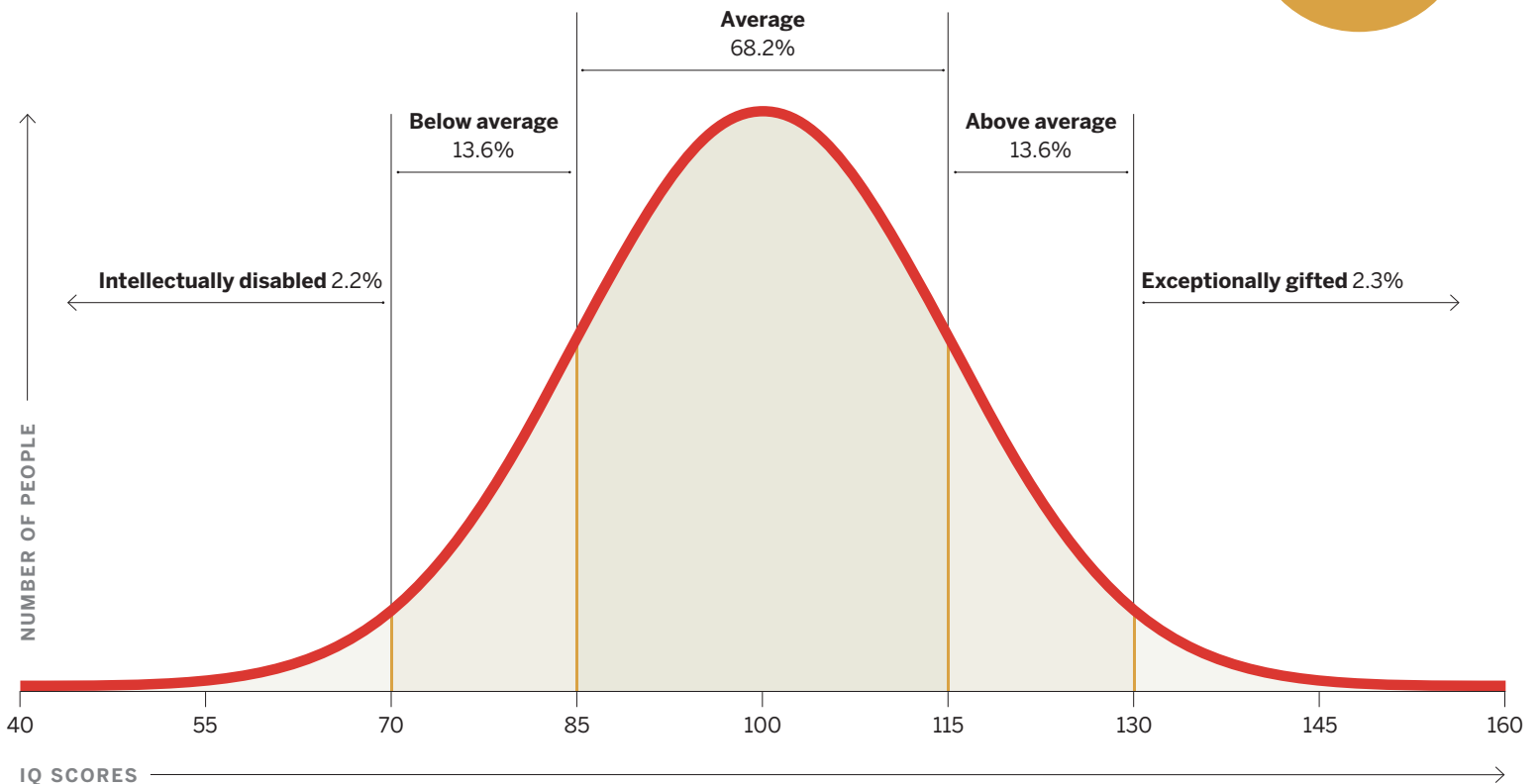
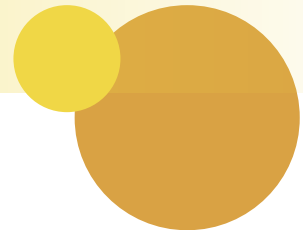
Shrinks established a century ago that IQ tests can predict performance ...

... but provocative interpretations of test results reinforced tragic misconceptions that persist to this day

## Intelligence falls on both sides of the average IQ score of 100

1 to 24:	Profoundly mentally disabled	:	115 to 129:	Above average or bright
25 to 39:	Severely mentally disabled	:	130 to 144:	Moderately gifted
40 to 54:	Moderately mentally disabled	:	145 to 159:	Highly gifted
55 to 69:	Mildly mentally disabled	:	160 to 179:	Exceptionally gifted
70 to 84:	Borderline mentally disabled	:	180 and up:	Profoundly gifted
85 to 114:	Average intelligence	:		

*Source: Compiled from multiple archives*





Although most Americans have never heard of Lewis Terman, they have unshakable faith in many of his views on high intelligence and IQ scores. Yet, if they heard some of the late Stanford professor's other thoughts on those subjects, they'd react with disbelief or even outrage.

In experiments that began in the early 1900s, Terman helped establish that high IQ scores tend to predict success in school and the workplace. That might seem like common sense now, but a century ago many believed early achievers faded later in life. A popular slogan, "Early to ripe, early to rot," summarized the prevailing view, according to a *Psychology Today* article.

But that's not the only Terman finding that has become conventional wisdom. His research also indicated that ability and outcomes vary greatly, even among people who scored in the top 1% in tests. That finding profoundly influenced later studies that explore, amplify and clarify the differences at the top.

Researchers have also built upon Terman's work to demonstrate that test-takers who score well in verbal ability tend to pursue careers in humanities-related fields, while those who correctly answer questions in mathematics and spatial perception often choose STEM-oriented jobs in science, technology, engineering and math.

But intellect's not the only determinant of outcomes, Terman found. Measurable factors like interests and values also exert influence. Those qualities can include fascination with the theoretical, economic, aesthetic, social, political and religious.

Terman's work also upended stereotypes of the gifted. Before he proved otherwise, society had regarded people with the highest IQ scores as physically weak and emotionally unstable. His research banished those notions forever.

Another shift that Terman precipitated came with his emphasis on studying and aiding the gifted, who need more stimulation than they typically receive in an average classroom. Previously, psychologists had concentrated on using testing to identify and assist the intellectually challenged.

The nature of the intelligence tests themselves also changed because of Terman. In 1916, he published the first of his several versions of the Stanford-Binet test, which revised previous tests. As early as 1915 he was emphasizing the importance of environment in determining outcomes.

His work expanded beyond testing in the schools during World War I, when he helped the military administer the first mass IQ testing. Of the 1.7 million recruits tested, three fourths could read and the rest could not, so the tests differed. Those who earned an "A" on the test were tapped for officer training, while those awarded a "D" or "E" were judged unfit to serve as officers.

Not everything Terman touched has stood the test of time. He led eugenics organizations that advocated limiting procreation by people deemed intellectually deficient. Eugenicists professed to believe their policies would "improve" humanity, and some in the movement favored forced sterilization to achieve that goal.

Meanwhile, research among unschooled African Americans, Spanish speakers and women in general convinced Terman of their genetic intellectual inferiority to white males. But a century of progress in education, job opportunities and civil rights has narrowed or obliterated test-score gaps among differing groups. Psychologists continue to work hard at discovering and uprooting cultural bias in test questions—efforts that Terman would probably have come to appreciate. He died in 1956 at the age of 79.

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# The Genius Guide to IQ

Scores on IQ tests can tell us a lot, but they can't tell us everything

BY ED MCKINLEY

**100**  
Average IQ score

**140**  
The beginning of genius IQ scores

**1904**  
First modern IQ was developed

**68%**  
of the population gets an average score on IQ tests

**1917**  
The beginning of widespread IQ testing in the U.S. military

“There are more things in heaven and Earth, Horatio, Than are dreamt of in your philosophy.”

—*Hamlet*, by William Shakespeare, first performed in 1602

Does IQ matter? Well, yes and no. High scores on intelligence-quotient tests often correlate with success. But psychologists agree that people amount to more than a single measurement of intellect can capture.

The predictive power and limitations of IQ scores have been apparent almost from the start of intelligence testing at the turn of the 20th century. French psychologist Alfred Binet designed the first tests to calculate a child's “mental age.” They were administered to identify kids who needed extra help in school.

The testing soon expanded to include adults, and now the tests are calibrated to produce an average score of 100. Most people fall within one standard deviation of the mean with a score ranging from 85 to 115, and the genius level begins at about 140.

At best, IQ scores yield an approximation of intelligence that psychologists characterize as a “snapshot.” Scores can decline as a person ages, and different IQ tests can produce slightly different scores for the same individual.

## A slippery subject

It's difficult to measure IQ because even after more than 100 years of research, experts still can't define intelligence. Just the same, English psychologist Charles Spearman proposed in the early 1900s that there's a general intelligence factor called “g,” which is written as a single uncapitalized letter.

The g factor was originally considered some sort of brain energy or brain deficiency that underlies all human abilities, according to Kevin McGrew, director of the Institute for Applied Psychometrics and a research professor at the University of Minnesota.

“I call it the Loch Ness Monster of psychology” because scholars have written about g for a century and are now coming to the conclusion that it doesn't exist, says McGrew, who earned the nickname “IQ McGrew” early in his career. “It's just a statistical artifact of the data,” he says of g. “It emerges from the data but doesn't represent anything that exists in the brain.”

McGrew explains what he considers the non-existent g this way: “There is no such thing as horse-

**Beware of IQ Clickbait** Although some experts warn against placing too much emphasis on IQ scores, a significant portion of the populace seems deeply curious about measuring intellectual capacity. It's one reason so many are taken in by short, inaccurate and sometimes fraudulent online IQ tests. • The quizzes might seem harmless enough, and they might even give a test-taker's ego the boost of a high score. But not only are they too brief and too unscientific to measure IQ accurately, they're often a scam designed to steal credit card numbers and other personal identification information. • So be forewarned. Those internet tests can come with fine print meant to absolve a con artist from responsibility.

power in a car engine. We call it an ‘emergent property’ because it emerges from the interaction of all these systems in there working together.”

But Scott Barry Kaufman, a psychology professor at the University of Pennsylvania (see p. 42 and the sidebar, right), feels confident that his colleagues will reach a balance between overemphasizing intelligence and denying that there’s any such a thing. “In statistics, it’s called regression to the mean,” he says. “It’s a real phenomenon.”

Another phenomenon that arises with IQ scores is their steady 100-year march upward, gaining about three points per decade. It’s called the “Flynn effect,” as documented by James Flynn, a professor who studied at the University of Chicago and taught in New Zealand (see pg. 43).

Scores are rising because the

world is changing from the concrete to the conceptual, says William G. Harris, CEO of the Association of Test Publishers. Other experts agree and also attribute the upward trend to improved health, education, nutrition and living standards.

### Foretelling the future?

Whatever intelligence might be, it can predict outcomes, according to Charles A. Murray, who wrote *The Bell Curve* with Richard Herrnstein (see p. 42). Murray argues that intelligence is better than parental socioeconomic status or educational achievement at forecasting income, job performance, criminal activity and pregnancy out of wedlock.

Still, a high IQ score doesn’t guarantee a bright future. The word “grit,” meaning “strength of character,” has come into increasingly wide use to describe qualities that lead to success. American psychologist Angela Duckworth describes the phenomenon in her book *Grit: The Power of Passion and Perseverance*.

What’s more, overreliance on IQ scores as a predictor of outcomes can lead to tragic errors, especially when schools use them as a “gating mechanism” that prevents students from realizing their potential, Kaufman says.

But testing is not going away, Harris insists. Artificial intelligence will find ways to make testing noninvasive and continuous. “It’s going to become effective for instant intervention after diagnostically identifying areas that may need remedial intervention,” he says.

If all of that seems like too much, just take Kaufman’s advice and visit his website, selfactualizationtest.com, to take a test that measures goodness, wonder and awe.

“There’s a wide world out there that lies far beyond knowledge of your IQ score,” Kaufman says, “even though IQ might be an important part of you.”

## THE EMPOWERMENT OF “INTELLECTUAL REVENGE”

Scott Barry Kaufman developed a “screw you” attitude that broke him out of the special education mold and carried him to the highest levels of academic achievement.



“It doesn’t feel good when you’re a child and you’re told that you’re stupid, right?” Kaufman says. “Like, that really upset me.”

Kaufman had an auditory disability that made it difficult to process information in real time. So, his school held him back in third grade and then relegated him to classes for the mentally challenged for the next five years.

In ninth grade, he took himself out of special education and began attending regular classes, where he worked feverishly to prove everyone who had underestimated him was wrong. By his senior year in high school he was getting straight As. Late in his high school career he wanted to switch to gifted education but was disqualified by his score on an IQ test he took at age 11.

Then came college. Based on his SAT scores, the psychology department at Carnegie Mellon University rejected his application. But he got into Carnegie Mellon by applying to the opera department and even won a partial scholarship for his singing ability. He later changed his major to psychology, earned straight As and graduated Phi Beta Kappa.

He went on to earn a doctorate in cognitive psychology at Yale and has taught at Columbia University, New York University and the University of Pennsylvania. He hosts *The Psychology Podcast*, contributes regularly to *Scientific American* and has written nine books, including the recent *Transcend: The New Science of Self-Actualization* (see p. 42).

He’s made it his life’s work to promote a broader understanding of intelligence.

● ● ●  
**Justices find IQ Guilty: In the case of Griggs v. Duke Power Co., The U.S. Supreme Court ruled in 1971 that using IQ scores or personality tests to determine employment can be discriminatory because of cultural bias in the questions. Testing is permissible only when the employer can prove it identifies characteristics essential to the job. For most companies, tests have been pariahs ever since.**



# Demystifying Mensa

Members of the best-known high-IQ society don't just discuss Proust or quantum mechanics. They know other ways of having fun, too.

BY ED MCKINLEY

The leaders of Mensa, a society that brings together extremely intelligent people, espouse some lofty goals for the organization. But in a lot of ways it's really a social club. Just ask Stephanie and Jameson Thornton, a couple whose courtship and marriage are intertwined with the Mensa experience.

Here's how their relationship started. Jameson, a Mensan living in San Francisco, decided it might be fun to attend one of the organization's weekend-long regional gatherings in Boston, a city he'd never visited. For Stephanie, a Boston Mensan, it was only natural to be at the meeting.

The two got acquainted at the gathering, finding they shared a competitive spirit as they bonded over board games. "He was willing to do Sudoku races with me, so I knew it was a good match," Stephanie recalls, citing their mutual interest in the number-placement puzzles.

A long-distance romance ensued with Jameson and Stephanie a continent apart. Then they found themselves together again in Boston at one of Mensa's annual national

meetings. Jameson was competing in the Mr. Mensa pageant, and Stephanie was discharging her duties as a Mensa board member and volunteer official.

That's when Jameson seized the opportunity to stage a classic event. Onstage, in front of hundreds of Mensa members, he went down on one knee to propose marriage. Stephanie accepted and six years later they're living in San Francisco with their 3-year-old.

And there's another twist to the story: When Stephanie met Jameson she was the widow of a man she'd also met at a Mensa event.

## Like-minded companions

Not everyone who joins Mensa finds a life partner the way Stephanie and Jameson did, but many members do discover a comradeship that's lacking in their everyday interactions, says Charles Brown, American Mensa director of marketing and communications.

"Our members join for a number of different reasons," Brown notes. "For some, it's that social aspect. It's just being around like-minded people. A lot of them found in their school experience and other experiences that they didn't fit in."

Without a peer group, people with high IQs can feel isolated or ostracized, notes Renee Lexow, American Mensa supervisory psychiatrist. Those feelings can lead to anxiety or depression, she says.

Stephanie Thornton—to use her in a second example—was experiencing that feeling of being alone when she began teaching school in Orlando, Florida. She didn't know many people there and missed the group of honors students she hung out with in college. But that changed when she joined Mensa.

"I found a home," Stephanie says of signing up for the organization. "Suddenly, I had a social life." She began attending lots of the local organization's events to play board games, go line dancing or frequent the Downtown Disney District. Soon, she began meeting up with members outside of the planned Mensa activities, too.

That wide variety of activities is typical, Brown observes. What Mensa members do when they congregate at the organization's meetings can be serious (physics or anthropology), athletic (hiking or rock climbing) or festive (puzzles or trivia contests), he says.



Dreams came true for Stephanie and Jameson Thornton, thanks to their membership in Mensa.

PHOTOGRAPH: COURTESY OF STEPHANIE THORNTON



**“Without a peer group, people with high IQs can feel isolated or ostracized.”**

## Global reach

No matter how Mensa members choose to interact, they're building upon an organization that began in England in 1946. The founders chose the name "Mensa," which is Latin for "table," because it suggests an image of members seated around a table, Brown says.

These days, Mensa International has 134,000 members in 100 countries. American Mensa has attracted more than 50,000 members, while British Mensa has signed up 21,000 and German Mensa has recruited 13,000.

American Mensa, which was started in 1960, has 130 or so local groups that organize weekly or monthly gatherings. Regional groups meet periodically, and a big national gathering occurs annually. Mensa is also divided into interest groups that explore about 125 different pursuits that vary wildly.

Besides all the fun, Mensa pursues three serious objectives outlined on the group's American website. "Mensa identifies and fosters human intelligence, encourages research into the nature and uses of intelligence and provides a stimulating intellectual and social environment for members," according to the site.

To achieve those goals, the Mensa Foundation works to inspire and empower giftedness for the benefit of society by presenting awards and scholarships and performing educational outreach and research, Brown says.

He notes that the Mensa constitution prohibits the organization from taking a position on any issue, but he adds that members have plenty of

**"Mensa members join for a number of different reasons. For some, it's that social aspect."**

their own opinions to make up for that restriction.

## Who joins?

That wealth of opinions springs from a diverse membership, Brown continues. "Our members are some of the most interesting people I've ever met in my life," he contends. "That doesn't mean they're all successful. It doesn't mean that they're all goal-oriented. It just seems that they're very curious, very intellectually fascinating people."

Stereotypes don't hold true for Mensans, according to Brown. "People hear that you have a high IQ and they think you probably walk around in a lab coat all day," he says. "I don't think that is a conclusion people can draw. It just means that you have a very curious, active, agile mind. And our members apply that in many different ways."

Brown shared an anecdote that illustrates some members' tendency to master one field and then move on to another to satisfy their curiosity. The story goes that the producers of a television quiz show contacted Mensa in their search for smart contestants. The organization contacted members, and one who replied said he had a bachelor's in biology and a master's in neuroscience but was driving a cab because he wanted to learn the craft of acting

by meeting and observing people.

Some members join later in life, but others discover the organization at an early age, Brown says. "A lot of the educational system is just not set up to handle gifted youth very well," he contends. "So, they tend to fall through the cracks."

## Who qualifies?

Anyone who places in the top 2% of the population on any test accepted by Mensa is eligible to join. That equates to an IQ score of roughly 132 on the Stanford-Binet test.

But Mensa offers its own test, too. Lexow, the American Mensa supervisory psychologist quoted near the beginning of this article, oversees the proctors who administer two-hour admissions tests owned by the organization.

She also determines whether other tests that candidates submit for admission qualify as valid. Mensa accepts some outside tests if they're administered and scored by qualified testers, but it doesn't admit prospective members on the basis of short online quizzes.

It's a testing process that yields a group of people who share at least one trait, Brown maintains. "If I could generalize about our members," he says, "it's that they are just insatiably curious about everything." 📦

**TOP 2%** The test results necessary to qualify for Mensa

**132** Minimum IQ score of Mensa members

**50,000** belong to American Mensa

**60%** of American Mensans are male



# The Smartest Man in America?

*Luckbox leans in with Chris Langan, a man with an estimated IQ score of 200, who breeds horses, ponders the nature of the universe and would never be confused with a rare and delicate hothouse orchid*

BY ED MCKINLEY



Some consider Christopher Langan the smartest person in America, but others go even further. They call him the smartest in the world. Either way, the 69-year-old Missouri rancher and philosopher has lived large in ways both good and bad. Despite having an IQ score estimated at 190 to 210 by ABC's 20/20—or perhaps partly because of it—Langan got off to a rough start in life. He survived a childhood of broken homes and schoolyard bullying. He accuses his third stepfather of abusing him. Dropping out of college, he labored for decades as a bouncer, cowboy, construction worker and forest ranger. Studying on his own, he eventually developed a disputed “Theory of Everything” that uses mathematics to prove the existence of God and the afterlife. Along the way, he’s developed a keen interest in conspiracy theories and stirred controversy with his pointed political views.

## Does IQ predict outcomes?

**Langan:** Up to a certain IQ level, yes. Beyond that level, no ... or yes, but in the opposite direction.

If there’s too large an intelligence gap between you and your prospective employer, you’re not likely to get hired. Many employers insist on being the smartest person in the room and don’t welcome competition. Those smart enough to realize your intelligence can make them extra money may not be smart enough to understand your ideas.

There’s an old rule of thumb in psychometrics called the “30-point rule,” usually attributed to psychologist Leta S. Hollingworth. It says that if the IQs of two people differ by 30 points or more (approximately two standard deviations), they’ll probably have a hard time understanding each other. Basically, the higher-IQ subject is not understood because his ideas have too much content for the other to follow, and the lower-IQ subject is not understood because the other perceives errors and holes in his ideas.

## Were you ever able to play the IQ card to your advantage—to use it to advance your career or ideas?

That’s seldom the way it works. But on the whole, being publicized as the “Smartest Man in America” has probably been a good thing for me. Specifically, it has been perceived by some as a good reason not to ignore my work. However, it also triggered a “cancel culture” as virulent as that which would later spring up against President Donald Trump.

In the high-IQ world, we sometimes talk about “the danger zone.” This is the IQ range in which one develops overweening confidence in one’s own intelligence but underestimates the intelligence of others and fails

to discern the limitations of one's own intellect. I've sometimes tended to attract baseless criticism from danger-zone egomaniacs who fancy *themselves* the world's smartest people and claim vast knowledge and expertise that can't be verified due to their tactical anonymity (use of pseudonyms). They're a veritable cancer of the internet.

Unfortunately, such trolls are often tolerated as members by social media and special-interest websites that produce valuable content, lending them false respectability. Sometimes this is because those running the forum are discombobulated danger-zone "debunker" types eager to loose the hounds on "cranks," "crackpots" and "enemies of science." Unfortunately, it turns out that these terms are readily applied to anyone with a capacity for original thought.

#### **What are the advantages and disadvantages of having a high IQ?**

If you have a sufficiently high IQ, you're better at figuring things out and seeing things coming. Obviously, this can do you considerable good in certain situations. But in some cases, it can make you overthink your situation and can thus interfere with your timing and resolve. Because of the notorious bell curve, which shows that highly intelligent people are much rarer than "normal" people, you can very easily be underappreciated and are more likely to feel isolated or downright alienated.

#### **Do you find it more fulfilling to socialize with people with high IQs? How do they differ from average people?**

Obviously, it is more stimulating to converse with people able to understand what you're saying, if only because they can appreciate

your intelligence and respond intelligently. This is why high-IQ people gather together in social groups. However, the level of competition rises in the bargain, leading to jousting, spats and feuds.

Highly intelligent people tend to identify with their ideas, the products of their intelligence, and can become quite belligerent when their ideas are challenged. When you challenge ideas held by a number of them and give them the worst of it, they tend to gang up on you and resort to insult, libel and slander ... or at least this is true of the danger-zone "dummies" who proliferate in some sectors of the high-IQ community.

As for *super*-intelligent people, they tend to be more tolerant of each other's viewpoints, and try to use them to improve their own understanding.

without some degree of utility.)

It's important to remember that an IQ test merely takes a "snapshot" of one's mental ability. A much more meaningful test is that of real-world intellectual accomplishment, especially involving original solutions for important problems. Sometimes, correctly identifying an important problem is itself a major achievement.

#### **You're self-educated. How do you feel about home-schooling in general?**

I'm presently in favor of it. Institutional schooling has always had three main purposes: education, socialization and indoctrination. At one time, the primary purpose of institutional schooling was education, with just a bit of socialization and indoctrination on the side. But this situation has been inverted.

**"If the IQs of two people differ by 30 points or more (approximately two standard deviations), they'll probably have a hard time understanding each other."**

#### **What tests have you taken? How much did your IQ score vary from one test to another?**

I've taken several standardized intelligence tests that measure IQ only up to 160 or a bit higher. These tests include the WAIS and Raven's Advanced Matrices. I've broken the ceilings of such tests. I've also taken some experimental superhigh-IQ tests that yield higher estimates. (I'd rather not specifically advertise them, but will merely say that they are not

Now, PC (politically correct) indoctrination and social engineering often seem to take precedence.

This is largely due to ideological trends and historical movements such as communism, socialism, the Frankfurt School, cultural Marxism, atheism, secular humanism, globalism and other influences that have been pressing on academia and Western society since the first half of the 20th century. Their demoralizing



“Super-intelligent people ... tend to be more tolerant of each other’s viewpoints.”

influence has reached a level from which children and young people need to be protected, and from which we all need to defend ourselves.

**Would you tell us about your Cognitive-Theoretic Model of the Universe? Has the model met opposition?**

The CTMU, or Cognitive-Theoretic Model of the Universe, is a protean self-reifying theory of reality with a unique structure equating it to reality itself. As such, it is the only viable candidate for an ultimate theory. The “C” also stands for “computation” and “consciousness,” reflecting the multifarious capacity of reality to coherently apprehend and transform itself.

Science now finds itself up against the hardest problems of all time: What is reality? Where does it come from and where is it going? What is life, what is its meaning and what are human beings in the scheme of things? What is consciousness? Is there a God, and if so, what is God’s nature? The CTMU is a highly sophisticated theory equipped with properties that support answers for these questions ... answers inaccessible to less-advanced scientific theories and methodologies.

The CTMU is at once a theoretical language, the universe or content of that language, and the model or interpretative mapping relating the language to its content. This structure, which has mental and physical (formal and substantive) aspects, gives it unique properties that make it

a true “Theory of Everything.” It can be characterized in several ways: For example, it constitutes a vast, self-contained mind which freely generates its own concepts and percepts; a coherent living language which talks to itself about itself; and a self-replicating “quantum of consciousness.” In spiritual contexts, it is sometimes called “Logos” or “Absolute Truth,” serving as a foundational metalanguage bridging the dualistic gap between science and religion.

One of the most recent and widely discussed scientific ideas about the overall nature of reality is the Simulation Hypothesis, which posits that reality is somehow akin to a computer simulation. In 1989, I published the first application



**“I’ve sometimes tended to attract baseless criticism from danger-zone egomaniacs who fancy themselves the world’s smartest people and claim vast knowledge and expertise that can’t be verified due to their tactical anonymity (use of pseudonyms). They’re a veritable cancer of the internet.”**

of this hypothesis to a well-defined philosophical problem, Newcomb’s Paradox, and went on to enunciate the “Reality Self-Simulation Principle,” according to which reality models itself for physical self-realization. The CTMU develops this idea to its fullest extent and can thus be described as the ultimate extension of the Simulation Hypothesis and the closest thing that it has to a well-structured theory.

As for opposition to the CTMU, the world is full of people who fancy themselves smarter than everyone else, and the internet provides some of them with an easy way to attack and belittle those who eclipse them or seem to stand in their way. Such people are generally called “trolls.” However, because the vast majority of such trolls fear to put their money where their mouths are and therefore hide behind pseudonyms, they are devoid of credibility. Nevertheless, many users of the internet seem to end up badly misinformed by them.

**What new media do you favor? What recommendations would you make?**

I prefer media which are not run by people who censor users and promote anti-Americanism.

I’m sure that readers are familiar with the “network effect,” in which the consumers of a product or service contribute to its value—the more people use it, the more value it is perceived to have. The network effect is a golden ticket for those who properly exploit it, including

companies like Google, Facebook and Twitter. The glorified techies who run these companies now dominate the internet and are using their dominance to control the information economy, to monopolize social, economic and political infrastructure and to promote oligarchic world government at the expense of national sovereignty, freedom of expression and human self-determination.

The story is always the same. Proprietary technology goes viral and saturates a targeted sector of the World Wide Web. Next comes the IPO. After that, the sky's the limit! Soon, no one who wants to remain connected and competitive has any choice but to use the viral technology in question, yielding to the demands of its proprietors and passively mirroring their opinions and beliefs.

However, many of us find certain aspects of this standardized ideology false and distasteful, and would rather not be pressured to conform. Accordingly, we prefer social media with proprietors who mind their own business, respect the nation that gave them the economic opportunity to do what they do, and don't try to cram their own preferences, opinions and beliefs down their users' throats.

**What else should we be saying about your story? After all you've been through, what's most important to you these days?**

For me, it has always been about my work. That's why I became involved in the high-IQ world in the first place—to write for high-IQ community journals, given that academic journals were closed to me—and I've never placed a high premium on my life story. In a way that's unfortunate, as I have a life story that few could hope to match. People love to talk and

fantasize about real-world blue-collar geniuses like “Good Will Hunting,” but never seem to know where to look for them. I'm about as real as it gets in that direction. I've lived a relatively rough and unsheltered life yet have found myself in the middle of some amazing situations and important transformations.

We're all familiar with the heartwarming, hope-for-the-future high-IQ stories that periodically show up in the media. Often, such a story features a precocious child who has been carefully nurtured and publicized by his or her parents, is starting college at a ridiculously young age, and hopes to cure cancer and crack the hardest riddles of science. Such children usually end up being spared the necessity of having to make their way from scratch in the real world. Instead, they proceed directly from the computer-equipped nursery to the ivory tower, or, become anonymous cogs in corporate machines run by more practical minds, or like the celebrated prodigy **William James Sidis**, drop out and squander their gifts on meaningless activities like collecting subway transfers.

This has led to the common impression that intellectual geniuses are rare and delicate hothouse orchids which cannot survive prolonged exposure to the blue-collar lifestyle and hard knocks of the real world, a mold I've never fit. Unfortunately, a working-class intellectual is simply more likely than a conventional hothouse orchid to be neglected and “cancelled” by trolls, prigs and hypocrites. Add to this the fact that IQ differences are now regarded as politically incorrect, and the problem is clear.

As for me ... well, suffice it to say that the world needs all the help it can get, and I've been trying to do my part. 🍷



**“The glorified techies who run [Google, Facebook and Twitter] now dominate the internet and are using their dominance to control the information economy, to monopolize social, economic and political infrastructure, and to promote oligarchic world government at the expense of national sovereignty, freedom of expression and human self-determination.”**

**William James Sidis** was reportedly reading newspapers by the age of 18 months. He learned 25 languages by age eight, entered Harvard at 11, published a book on the origin of life called *The Animate and the Inanimate* at 20 and patented a perpetual calendar at 30. But he didn't maintain that hyperintelligent trajectory. Instead, he wound up in menial jobs and whiled away the time by collecting streetcar transfers. He died of a cerebral hemorrhage in 1944 at age 46. His IQ was estimated to be an extraordinary 250–300.

For more on Chris Langan visit [ctmu.org](http://ctmu.org) @realchrislangan on Twitter CMTU Radio on YouTube



# High IQ Outcomes

The human race is pretty smart. We've come up with nuclear fission, space travel and a quick vaccine for Covid-19. But what else can we say about the smartest people?

## CAN THE IQ OF A NATION PREDICT ECONOMIC RESULTS?

Yes. The average IQ of a country's citizens correlates with the strength of its economy and with its economic prospects. The national average intelligence scores, right, were calculated by Richard Lynn, a British psychologist, and Tatu Vanhanen, a Finnish political scientist. In the last decade, they analyzed IQ studies from 113 countries.

The scores met with criticism from the academic community, as summarized by Juri Allik, professor of psychology at the University of Tartu. "By analogy with many previous controversial discoveries, it is predictable that the first most typical reaction would be denial," Allik wrote. "Many critics are not able to tolerate the idea that the mean level of intelligence could systematically vary across countries and world regions."

The authors responded by noting that "our national IQs are highly correlated with national scores in tests of mathematics and science ... If our IQs were meaningless, they would not be highly correlated with a wide range of economic and social phenomena."

### **Top 30 countries ranked by national IQ score**

Singapore . . . . .	108
South Korea . . . . .	106
Japan . . . . .	105
Italy . . . . .	102
Iceland . . . . .	101
Mongolia . . . . .	101
Switzerland . . . . .	101
Austria . . . . .	100
China . . . . .	100
Luxembourg . . . . .	100
Netherlands . . . . .	100
Norway . . . . .	100
United Kingdom . . . . .	100
Belgium . . . . .	99
Canada . . . . .	99
Estonia . . . . .	99
Finland . . . . .	99
Germany . . . . .	99
New Zealand . . . . .	99
Poland . . . . .	99
Sweden . . . . .	99
Andorra . . . . .	98
Australia . . . . .	98
Czech Republic . . . . .	98
Denmark . . . . .	98
France . . . . .	98
Hungary . . . . .	98
Latvia . . . . .	98
Spain . . . . .	98
United States . . . . .	98

Some critics can't tolerate the idea that the mean level of intelligence varies across the world.

Source: Intelligence: A Unifying Construct for the Social Sciences, 2012, Richard Lynn and Tatu Vanhanen



## Famous Brains

- Miley Cyrus . . . . . 120
- Bruno Mars . . . . . 123
- George Clooney . . . . . 127
- Vladimir Putin . . . . . 127
- Nicole Kidman . . . . . 132
- Arnold Schwarzenegger . . . . . 135
- Shakira . . . . . 140
- Vin Diesel . . . . . 140
- Matt Damon . . . . . 143
- Warren Buffet . . . . . 145
- Mark Zuckerberg . . . . . 152
- Ashton Kutcher . . . . . 154
- Sigmund Freud . . . . . 156
- Albert Einstein . . . . . 160
- Bill Gates . . . . . 160
- Steve Jobs . . . . . 160
- Conan O'Brien . . . . . 160
- Elon Musk . . . . . 165
- Stephen Hawking . . . . . 169
- Carl Sagan . . . . . 173
- Charles Dickens . . . . . 180
- Leonardo DaVinci . . . . . 181
- Nikola Tesla . . . . . 189

Source: iqcertificate.org

## OUTLIER IQS

Even within the top 1% of ability, more ability matters. In fact, the idea that beyond a certain threshold, say an IQ of 120, more ability doesn't have much meaning has been proven false. • Gifted youth grow up to become highly accomplished adults, earning doctorates, achieving higher income, winning patents and amassing other creative achievements at very high rates relative to the general population.

Source: *Psychology Today's* reporting on the long-term *Study of Mathematically Precocious Youth*, which began in the early 1970's and continues today. The study includes over 5,000 adolescents identified in the top 1% of general intellectual ability.



**Roughly 40% or more of billionaires, judges, CEOs and senators, and 20% of the members of the U.S. House of Representatives were in the top 1% of cognitive ability. Therefore, a large fraction of the U.S. elite are indeed smart and highly educated.**

Source: *Investigating America's Elite: Cognitive Ability, Education and Sex Differences*, a 2013 paper by Jonathan Wai



# Dismantle the Cult of Smart

Variations in IQ scores are one reason schools should stop trying to squeeze every student into the same academic mold

BY ED MCKINLEY & MIKE REDDY



Fredrik deBoer, author of *The Cult of Smart: How Our Broken Education System Perpetuates Social Injustice*, believes IQ scores can say something significant. They're one indicator that some students will never succeed in the classroom, and thus they point to the crying need for change in the education system, he says. The New York-based writer, an avowed Marxist, sat down with *Luckbox* and shared his thoughts on how the nation's schools can accommodate kids who aren't inclined or equipped for the academic life. He was filled with ideas that could appeal to people anywhere on the political spectrum. (*For more on his new book, see pg. 42.*)

**You've called the American educational system broken. What's wrong and how can we change it?**

**deBoer:** Our system is now failing to provide the good life for everybody, in large measure because it was never intended to. College now receives an enormous amount of pressure as the sole means through which we can move people *en masse* from lower- and middle-class backgrounds into upper-middle-class futures. And the system is straining under the weight of all that.

Famously, for a period of decades in this country, people who were not college-educated could go to the factory at the edge of town, get jobs in manufacturing—often with a union—and be able to support themselves, a spouse and a couple of children. They could own a home, own a car, etc. The ability of people with only a high school diploma to secure that future has died out over the last 40 or 50 years, largely due to automation and offshoring.

What we're doing instead—because that system has failed—is we're now pushing more and more people into college to try to get them ready for the workplace of tomorrow. But college is a relative advantage. In other words, part of what makes a college degree valuable is its scarcity.

So if you make degrees less scarce, you're going to have less value for the people who have them. Also, not everyone is meant to go to college, and the system is really straining under the many new enrollees who lack the basic prerequisite ability to get through a college program. That results in spiraling costs for mediation, ever-higher tuition costs and people saddled with tens of thousands of dollars in student loan debt. So the system is failing in that sense.

### How might IQ scores factor into employment?

The evidence is quite strong that there are certain kinds of cognitive tasks that are captured in an IQ test, or an SAT test or similar tests. They capture some ability that those people have to solve certain kinds of cognitive tasks, and those tasks are useful in many places in society.

Some people have these intellectual abilities that will benefit them economically, no matter what. But not everyone has those abilities. And the response to that fact in the policy domain has been to say, 'Well, let's just blame our educators, and let's put more and more pressure on the education system to make everyone have these cognitive tools.'

My position is to say, 'Look, you've been trying that for decades. You've invested hundreds of billions of dollars into it. You've enlisted the manpower of millions of people. You've spent countless hours on this. And yet, we have not seen anything like the kind of changes that you want to happen at scale.'

We're continuing to fail at the most basic desires of the education reform movements. Rather than trying to beat our heads against the wall and say, 'How can we change this reality?' I want us to accept reality and not use a narrow lens—to broaden our conception of what makes someone a valuable human being by looking beyond just those cognitive tasks that tend to be, to some degree, inherent.



**“Part of what makes a college degree valuable is its scarcity.”**

I want us to be a society that inculcates our children not just intelligence, not just academic aptitude, but also compassion, creativity, curiosity, grit, etc. We should expand the definition of what it means to be educated and what it means to be a valuable human being culturally and economically, so that more people in our society can be deemed worthy of the good life.

the same things to contribute, then insisting on having a Common Core, insisting on having all these difficult-to-meet education standards, is just creating misery in our population of students.

They're completely arbitrary barriers to academic success for these students. And there's no research to indicate that these standards are actually promoting educational excellence. So, part of

**“We must create an education system that works for everyone—not just the intellectually gifted.”**

### How can we move the system in that direction?

The system right now is set up—to a greater and greater degree—to narrow the potential paths forward for our students. There is an educational standardization movement, which has been remarkably successful in this country, which is epitomized by the Common Core.

### Isn't Common Core just a set of goals?

The Common Core is a set of requirements designed to create a universal public school curriculum in the United States. For example, you have to have X number of math credits by this age, or you have to take Algebra II in a certain year.

That concept that everyone should be viewed with the same metrics is the opposite of what we want, right? If we have the courage to accept that different people are good at different things, that everybody has something to contribute but not everyone has

that is loosening those standards, giving students more electives, more choices in their classes, letting them avoid classes where they know they're going to do poorly.

### Doesn't society have a responsibility to help students achieve academic competence?

We have to acknowledge from the beginning that a number of our students are going to emerge into menial jobs that don't provide a great deal of life satisfaction and don't provide a living wage. That's how things are going right now, and that's going to be true regardless of whether or not we are forcing them through a particular curriculum at school.

We have this break in the system where wealth is being generated. Such a vast portion of that wealth is going to such a small percentage of the people that there just is not enough money in the pie for regular people to be able to live their lives. And there's no education policy that can fix that. 📦



# Your Brain on Speed

How would you score on a cognitive ability test? *Luckbox* teamed up with *JobTestPrep* to share questions similar to those used on the iconic Wonderlic test.

The Wonderlic Contemporary Cognitive Ability Test doesn't yield an IQ score, but the American Mensa version of the Wonderlic has been among the test batteries used most frequently to qualify for membership in the high-IQ society.

The test, introduced in 1936, assesses cognitive ability and problem-solving aptitude, and it's used to evaluate potential employees' abilities in a variety of industries—even the NFL Scouting Combine administers it.

The full version of the test comprises 50 questions, and test-takers have 12 minutes to answer as many correctly as possible. Although it's not an IQ test, the average score on the Wonderlic is around 20-21 points, which is roughly equivalent to the average IQ score of 100.

Average scores for Wonderlic test-takers from a single industry paint a telling picture. Results collected in 1983, for example, showed median scores above 30 points for systems analysts, chemists and electrical engineers. The high 20s were home to engineers, programmers, accountants and executives. And the upper teens to low 20s is where cashiers, clerical workers and receptionists typically scored.

In its more than 80 years of use, the Wonderlic has become one of the most popular cognitive ability tests. It proved its entertainment value when several staff members of *The Howard Stern Show* took the test.

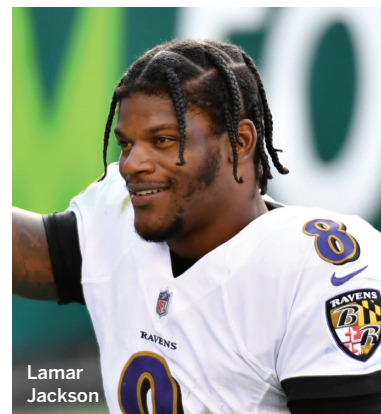
## Average Wonderlic Scores by NFL Position

- 26 Offensive tackle
- 25 Center
- 24 Quarterback
- 23 Guard
- 22 Tight end
- 19 Safety
- 19 Linebacker
- 18 Cornerback
- 17 Wide receiver
- 17 Fullback
- 16 Halfback

## Passing the Test

Do Wonderlic scores predict quarterback performance? Conspicuous correlations seem to occur. Ryan Fitzpatrick, a Harvard alum, scored a 1580 on the SAT back when it was out of 1600. His 2005 Wonderlic score of 48 is noted to be among the top three scores for NFL players.

Despite their large disparity in Wonderlic scoring, Fitzpatrick, a 15-year NFL veteran, and Baltimore Ravens rising star Lamar Jackson have something in common: Both QBs led their teams in rushing yards in 2019.



Name	Wonderlic Score	NFL Passer Rating	Salary (avg. ann.)
Ryan Fitzpatrick	48	82.3	\$5.5M
Eli Manning	39	84.1	\$21M
Aaron Rodgers	35	103.9	\$33.5M
Tom Brady	33	97.3	\$25M
Jay Cutler	26	85.3	\$10M
Ben Roethlisberger	25	94.0	\$34M
Patrick Mahomes	24	108.7	\$45M
Cam Newton	21	85.8	\$1.75M
Lamar Jackson	13	102.6	\$2.4M

NFL passer ratings measure the performance of quarterbacks. The ratings fall within a scale of 0 to 158.3, and factor in passing attempts, completions, yards gained, touchdowns and interceptions. The higher the rating, the better. Data from curated sources including [spotrac.com](http://spotrac.com) and [nfl.com](http://nfl.com)

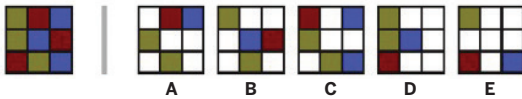
## TAKE THIS SAMPLE WONDERLIC TEST

Remember, this is a speed test. The complete version asks 50 questions in 12 minutes. To simulate the testing environment, use your first instinct as your answer.

1. \_\_\_\_\_ is to JUICE as WHEAT is to BREAD

- A. Water
- B. Pitcher
- C. Supermarket
- D. Soda
- E. Orange

2. Which THREE choices are needed to create the figure on the left? Only pieces of the same color may overlap.



3. A motorcyclist rode between Flibbertown and Guinevill at a steady pace of 60 miles per hour for two hours. After two hours she accelerated to 65 miles per hour for another full hour. What is the distance between those cities?

- A. 150 miles
- B. 180 miles
- C. 165 miles
- D. 185 miles
- E. None of the above

4. In the stock market, four different stocks have an average price of \$100 per stock. The price of a Drone stock is \$70. What is the average price of the three other stocks (not including the Drone stock)?

- A. 107
- B. 110
- C. 112
- D. 117
- E. Cannot say

5. How many of the five pairs listed below are exact duplicates?

Omar A. Mahmoud	Omar A Mahmmoud
Elenora R. Deleeuw	Elenora R. Deleeuw
Jann R. Depaul	Jahn R. Depaul
Jeremia N. Inch	Jeremia N. Inch
Walton V. Constante	Walton V. Constante

- A. 1
- B. 2
- C. 3
- D. 4
- E. 5

6. Which alternative includes all the states that border Oklahoma?

- A. Texas, New Mexico, Arkansas, Missouri, Kansas, Colorado
- B. Texas, Arkansas, Missouri, Kansas, Louisiana, Colorado
- C. Texas, New Mexico, Mississippi, Missouri, Kansas, Colorado
- D. Texas, New Mexico, Kansas
- E. Texas, Arkansas, Missouri, Kansas, Colorado

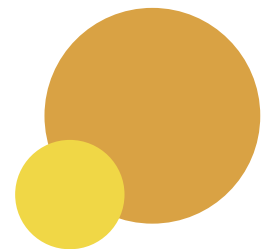
7. Arrange the following words to make a complete sentence. What comes just before the word "by?"

*suitcase by managed the carry to himself Mike*

- A. Himself
- B. Managed
- C. Carry
- D. Suitcase
- E. To

8. Jade is 9 years older than Rose. In 4 years' time, Jade's age will be double Rose's age. What are their ages today?

- A. Jade is 5 years old and Rose is 14 years old
- B. Jade is 14 years old and Rose is 5 years old
- C. Jade is 2 years old and Rose is 11 years old
- D. Jade is 10 years old and Rose is 1 year old
- E. Cannot be determined



How did you score? Turn the page for the answer key. —————>



## WONDERLIC TEST ANSWER KEY

**1. The correct answer is (E).**

An orange is used to produce juice like wheat is used to produce bread. In addition, both wheat and oranges must be processed to produce the final product. This eliminates answer (A).

**2. The correct answers are: (A), (B), and (E).**

If you place figures A, B, and E one on top of the other, the figure on the left is created. In order to find the correct solution quickly, ask yourself which figures cannot be a part of the solution. Option (C) cannot be a part of the solution because it has a red tile on the top right instead of a green tile. Option (D) seems like the right option to start with, but when assembled with other figures there are some blank tiles left.

**3. The correct answer is (D).**

In order to solve the question, we need to separate the two stages. The first stage is the two-hour ride at a rate of 60 mph; the second stage is the one-hour ride at a rate of 65 mph. If we sum up the distance of both stages, we will find the distance between the cities. Therefore, the total distance between the cities is 120 miles + 65 miles = 185 miles.

**4. The correct answer is (B).**

In order to calculate an average, we have to know the sum of the individual values, and the number of individuals. We know that there are four different stocks, so the number of individuals is four. Now, find the sum of the prices of all the stocks.

If an average is provided followed by the number of values, the sum of the values can be calculated. The sum is calculated as follows: Number of values X Average = Sum of the values.

**5. The correct answer is (C).**

**6. The correct answer is (A).**

Six states border Oklahoma: In the north, Kansas and Colorado. In the south, Texas.

In the east, Arkansas and Missouri. In the west, New Mexico.

**7. The correct answer is (D).**

The sentence should read: "Mike managed to carry the suitcase by himself." Therefore, the word that comes before the word "by" is "suitcase."

**8. The correct answer is (B).**

All the information given is based on the relation between Jade's age and Rose's age. Let's denote Jade's age by X and Rose's age by Y.

"Jade is 9 years older than Rose." We can translate this information into an equation:

$$X = Y + 9.$$

Unfortunately, an equation with two variables is not solvable unless we have another equation.

"In 4 years' time, Jade's age will be double Rose's age." The second sentence also represents a relation. It means that in four years, Jade's age will be X+4 and will be double Rose's age, which will be Y+4.

$$X + 4 = 2(Y + 4)$$

Now we have two different equations with 2 variables. The first variable, X, is isolated in the first equation, so we can insert its value in the second equation by denoting X as an expression of Y.

$$(Y + 9) + 4 = 2(Y + 4)$$

Solve for Y and you will get 5, and the only answer which states that Rose's age of 5 is answer (B).



Want to test yourself further? **Luckbox** readers can use coupon code **wonderlic2020** for a 25% discount on test prep materials at [jobtestprep.com](http://jobtestprep.com).

**What is JobTestPrep?** JobTestPrep curates test-taking resources for job seekers. The company, founded in 1992, has helped more than 500,000 people prepare for interviews and psychometric exams, such as the Wonderlic, Criteria Cognitive Aptitude Test (CCAT), police exams and many others. • While not officially affiliated with the Wonderlic company or its site, JobTestPrep uses technical reports, business documents, commercial data and its customer base to fine-tune its prep materials to offer the best possible test simulations possible.



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# trends

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WELLNESS

## Your Brain on Sleep



Americans spend a third of their lives sleeping—or trying to, anyway. And although it may come naturally, how and how often people sleep can play a game-changing role in their cognitive abilities.

**By Mike Reddy and  
Yesenia Duran**

**G**etting enough sleep is a smart idea. Literally. A wealth of studies indicate sleep deprivation carries adverse side effects, ranging from poorer mental and physical health to decreases in cognitive performance and development of intelligence, especially among children.

Those dire consequences became clearer in a study of 316 randomly sampled fifth graders in Changsha, China. The students were divided into two groups based on how much sleep they averaged a night. Those who slept less than eight hours were put into a sleep deprivation group, and those who slept eight or more hours a night were deemed the control group.

Researchers administered the Chinese Wechsler Intelligence Scale for Children to both groups, finding that students in the sleep deprivation group significantly underperformed in verbal IQ, performance IQ and full-scale IQ. The sleep deprivation group also demonstrated lower verbal comprehension and



lower scores for memory/attention, compared with the control group.

But negatives associated with sleep deprivation aren't exclusive to children. A separate study, conducted by the Sleep Research Unit at the University of Turku in Finland, attributes impaired attention and working memory to sleep deprivation. It can also affect long-term memory, decision-making and attention, according to the study.

So if sleep's that important, just how pervasive is sleep deprivation? How much sleep is enough? And is it possible to sleep too much?

To answer those and other questions related to sleep and brain health, researchers at Western University in London, Ontario, conducted what's been dubbed the "world's largest sleep study" back in 2017. More than 40,000 people around the world participated by filling out questionnaires and taking cognitive tests over a three-day period, and the results paint a picture of how the world sleeps.

Of the more than 40,000 participants, approximately half reported sleeping less than 6.3 hours per night. And while pulling all-nighters can be tempting, the study found that those who slept four hours or fewer performed on cognitive tests as though they were about nine years

older than their actual age.

"We found that the optimum amount of sleep to keep your brain performing its best is seven to eight hours every night," lead author of the study Conor Wild said. "That corresponds to what the doctors will tell you you need to keep your body in tip-top shape as well."

And the findings didn't stop there. The researchers determined the seven- to eight-hour threshold applied to all adults equally, regardless of age.

Some evidence suggests that even a single night's sleep could help counteract the negatives associated with sleeping less than the recommended threshold, as participants performed better on tests if they slept more than their usual amount, as opposed to their usual amount or less. But those tempted to sleep in to make up for lost bedtime might want to reconsider.

"We also found that people who slept more than that amount were equally impaired as those who slept too little," Wild said.

Oversleeping is associated with a variety of health problems, including Type 2 diabetes, heart disease, obesity, depression and headaches, according to Johns Hopkins Medicine. Although it's not clear whether oversleeping contributes to these

illnesses or is just a side effect of them, the cognitive benefits alone warrant reconsideration of that next 12-hour snooze.

Sleep deprivation, on the other hand, is becoming more common, particularly among older demographic groups. In fact, aging is considered a source of sleep deprivation—both due to side effects of medications and other medical problems that arise with age, according to Columbia University's Department of Neurology. It's estimated that half of people over 65 run into frequent sleeping problems.

So, how does one combat sleep deprivation? Columbia offers the following strategies for people with mild sleep issues:

- Exercise at least 20 to 30 minutes each day, at least five to six hours before going to bed. That makes one more likely to fall asleep later in the day.
- Avoid substances that contain caffeine, nicotine and alcohol, all of which can disrupt regular sleep patterns. Quitting smoking is always a good idea.

More severe cases of sleep deprivation are tackled best with a personalized, doctor-assisted approach. But regardless of how one reaches the seven- to-eight-hour threshold, getting there is a smart idea.

**68%** of Americans struggle to sleep at least once a week

**41%** use over-the-counter sleep aids several times a week

Source: Consumer Reports

**How many hours of sleep do you average each night?**

< 5	3%
5-6	18%
6-7	34%
7-8	35%
8-9	9%
> 9	1%

Source: Luckbox Reader Survey

## Sleep Machines

**Sound+Sleep SE**, a sound machine designed to help users sleep better, mimics 64 distinct high-definition natural sounds that constantly evolve and never loop. The SE features patented adaptive sound technology that empowers the machine to listen intelligently to the user's environment and automatically raise volume to mask unwanted noises. \$99, [soundofsleep.com](http://soundofsleep.com)

**SNOOZ**, a portable white-noise machine, turns any bedroom into a haven for sleep. Inside, a mechanical fan spins to generate peaceful white noise. Ten volume settings help users fall asleep and stay asleep. The device supports companion apps for added functionality. Use the accompanying app to turn up the volume without getting out of bed, or use the automatic scheduler to set it and forget it. \$79, [getsnooz.com](http://getsnooz.com)



PHOTOGRAPH: GARRETT ROODBERGEN

# ARIANNA HUFFINGTON SLEEPS

Arianna Huffington, former editor-in-chief of *The Huffington Post*, is no stranger to sleep deprivation, having fainted from exhaustion a few years ago. After writing about the experience, she learned on a book tour that the public shares her keen interest in the subject.

So Huffington has continued to devote energy to understanding sleep and sharing what she's learned. One product of that effort is a book she calls *The Sleep Revolution: Transforming Your Life, One Night at a Time* (see pg. 43).

"Sleep is the underpinning of every aspect of our well-being," Huffington says. "The science shows that sleep affects our decision-making, problem-solving, memory, creativity, focus, attention, energy, and our physical and mental health. So if you're looking to increase your productivity, you should start with sleep."

Here's what else Huffington had to say in an exclusive interview with *Luckbox*.

## How can people know how much sleep they need?

Experts recommend seven to nine hours of sleep per night for adults. There are some who can get by on less—so-called "short sleepers"—but that's the result of a genetic mutation that occurs in about 1% of people.

## Do midday naps work?

If you need them, absolutely. Winston Churchill coined the term "power nap" and won the Second World War, so naps are definitely not a waste of time! As countless studies have shown, they make us more focused, more energized and more efficient in whatever we're doing throughout the rest of the day.

## Where is most of the growth in the \$70 billion sleep industry?

It's in products and technology that help us not just to track our sleep, but also to help us get more sleep. For instance, Thrive recently partnered with Audible to launch a collection

Arianna Huffington



of sleep solutions—from guided meditations and bedtime stories to sound baths and microsteps for better sleep—designed to help people rest. The growth in sleep technology shows people are finally realizing how important sleep is, and the market is responding. These can be useful tools helping people increase their sleep quality, but they're still no substitute for making time to unplug and recharge, both during the day and especially at night.

## What are some simple, actionable steps people can take to get a better night's sleep?

One of my favorite microsteps is to gently escort my devices out of my bedroom before I go to bed. Phones are amazing tools, but they're also repositories of everything we need to put away to allow us to sleep—our to-do lists, our inboxes, our anxieties, the demands of the day. So charging our phones outside of our bedroom makes it more likely that we'll wake up as fully charged as our phones.

Another microstep that's especially useful these days is to set a news cut-off time. Being informed is a good thing, especially in a public health crisis, but we also need to take a break from our screens and the stress that can go with them. So we can just pick a time each night when we stop consuming news (getting rid of some push notifications helps too!). This allows us to have a recharging night's sleep and put the stressful news into perspective.

Only **one**  
in **10**  
Americans  
considers  
sleep a top  
priority over  
fitness, work,  
hobbies and  
social life.

Source: Sleep Foundation



# YOUR GREEN MATTRESS

Over the course of a lifetime, the average person spends about 26 years (9,490 days) sleeping, not to mention seven years trying to get to sleep. That's a total of 33 years in bed and a good reason to care about mattresses.

Discussions about healthy sleeping habits often center around when and how long people sleep. That makes it easy to gloss over the importance of what people sleep on. Comfort is undoubtedly essential, and some people prefer firmer mattresses while others favor softer ones. But nobody prefers a mattress that emits noxious chemicals.

Polyurethane, flame retardants and plastics commonly found in mattresses are known to release gaseous chemicals, according to health news syndicator HealthDay. Body heat could play a role in releasing those chemicals while sleeping. The chemical emissions often remain below levels that harm most people, but anyone with sensitivities to them is left looking for alternatives.

Leading the charge to revolutionize the mattress industry are companies like **My Green Mattress**, which produce and sell organic mattresses.

Tim Masters, the company's founder, has been in the organic mattress business since 2007, long enough to see his business grow and his direct competitors proliferate. He made his first all-natural mattress for his daughter, who suffered from eczema and allergies, and then turned the idea into a full-scale, family-owned business.

"The organic market has really taken off," Masters told *Luckbox*. "It's just become popularized as of maybe 2016, 2017, so in the last four

or five years."

Masters hoped at the beginning of 2020 for an 8% to 10% annual growth rate. But despite the pandemic, My Green Mattress was ahead 24% in the fourth quarter of 2020—a figure he said made him a slowcomer compared with his friends in the industry.

But what makes organic mattresses, which Masters estimates account for anywhere from 8% to 10% of all mattress sales, different? In the case of My Green Mattress, it means they were made in a GOTS (see right) and GOLS certified factory, often considered the gold standards for guaranteeing a product is organic.

Manufacturers achieve certification for GOTS, or the Global Organic Textile Standard, when an on-site inspection by an independent certification body determines

an entire textile supply chain—from processing to trade—meets the ecological and social criteria.

GOLS, or the Global Organic Latex Standard, certification mandates that organic latex and finished latex foam must contain a minimum of 95% certified organic raw material by weight.

Together, the certifications help give consumers peace of mind that the mattresses they purchase are truly made with organic materials.

My Green Mattress supplies a variety of organic mattresses, from hybrid and spring-free to latex-free and crib mattresses. And with so

many quarantining students and workers using mattresses as desks and office chairs, the desire to reduce exposure to chemicals may usher in a new era for the organic mattress industry. 🏠



Americans who reported having very good or excellent health had **23 more minutes of sleep** than those who rated their health as good, fair or poor.

Source: National Sleep Foundation

Luckbox readers' My Green Mattress discount code: **ESCAPE2020**





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## THE NORMAL DEVIATE

# The Smartest Guys in the Trade

Traders don't need the highest IQ in the room—they can succeed with discipline, quick calculations, confident decisions and a little online help **By Tom Preston**



People are sensitive about IQ. It's a metric that purportedly reveals intelligence, and everyone wants to be thought of as smart—or at least smarter than average. And in the 100 years or so since IQ tests arose, proponents and opponents have argued vigorously for and against them.

One of the most contentious discussions of IQ centered on the 1994 book *The Bell Curve* by Charles Murray and Richard Herrnstein. The authors analyzed and plotted IQs and saw that they fell nicely along the shape of a bell curve, more properly known as a normal distribution. Most IQs were clustered around an average. A small number were on the far left-hand side, with lower than average IQs, and a smaller number were on the far right-hand side, with higher than average IQs. But where someone fell along that curve created the arguments.

The problem is that no one really knows how people get the IQ that they have. It's likely a mixture of the hardware (our brains) and the software (what we learn), but determining the proportions is a question that stumps even the geniuses. The most vexing part of IQ is that it might be immutable. That is, your IQ doesn't improve with age, college or a visit to the Wizard of Oz. It's possible that no matter how hard one works at it, their IQ won't go up. But if it's true that a higher IQ indicates greater success in life, then how does society help those with lower IQs? Let's turn everyone into traders.

*The Bell Curve* came out shortly after I finished my MBA at the University of Chicago, a place populated by people who may or may not have had high IQs but who aggressively believed they did. It was where I learned about how the normal distribution worked, the math behind it and how to apply it to trading. That was the genesis of all the probability numbers on trading platforms. As I started my trading career, I met people who I would guess had decidedly average IQs but were successful traders nonetheless. They balked at intermediate math and didn't always grasp advanced trading concepts. But they could add and subtract fractions quickly and make trading decisions confidently. They could stick to a game plan that had worked in the past but adjust it if it didn't work in the future. A very high IQ just wasn't necessary.

Anyway, a high IQ is kind of like a boat. Sure, it's nice to have one. But it can be even better if a friend has one. When a friend has the boat, you can invite yourself for a ride when the weather's nice, or borrow it to throw an awesome party. Your friend worries about maintaining it. When your friend has a high IQ, you can ask her how to calculate the probability of a trade making money, how to quantify the risk of a pairs trade or how to develop a model for volatility mean reversion. You skip the math and just take that info to try to make money.

A handful of people with high IQs build platforms that hundreds

**Compared with average investors**, high-IQ traders are less inclined to keep assets that have lost value, more aggressive about tax-loss trading and more likely to supply liquidity when stocks experience a one-month high. High-IQ investors also exhibit superior market timing, stock-picking skill and trade execution.

Source: *Journal of Financial Economics*

of thousands of traders can use. Yes, it's high IQs that revolutionize trading technology. But rather than being on the far right-hand side of the IQ curve, a successful trader needs to emphasize discipline, fast decisions and confidence. Sure, a trader needs to be smart enough to know the difference between a short call and a short put, but trading doesn't always involve calculations or complex concepts. Now, with trading online, all those numbers are delivered via computer, and people with a wide range of IQs can use them.

So, rather than worrying about whether your IQ is high enough, or whether IQs are normally distributed and where you might fall along that curve, get trading. Asset returns are normally distributed, and that

underlies everything from Black Scholes theoretical values to options greeks. Use that information to be a more informed and successful trader. If you trade options, the normal distribution shows the probability that a short put will expire worthless. If you trade stock, it provides the probability that the stock will reach some higher price between now and a future date. You only need a high enough IQ to know that a 70% probability of making a profit is higher than a 50% probability of making a profit. Let the eggheads worry about IQs. You've got money to make. 📦

**Tom Preston**, *Luckbox* contributing editor, is the purveyor of all things probability-based and the poster boy for a standard normal deviate.

## BELL CURVE DEBATE

Political scientist Charles Alan Murray, co-author of *The Bell Curve*, argues in the controversial book that intelligence—not educational achievement or the socioeconomic status of one's parents—predicts outcomes in life (see pg. 42). He writes that blacks have lower IQs than whites because of genetics and that social welfare programs meant to improve conditions for the disadvantaged don't work.

Because of those views, Murray was shouted down during a campus lecture four years ago. That caused Sam Harris, a podcaster who's a critic of religion, to categorize Murray as cancel culture's "patient zero." Harris contends that Murray fell victim to political correctness, destroying his reputation simply because he honestly discussed his research. Others contend Murray's conclusions on race have been discredited.

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## AGTECH

# Smart Farming Goes Vertical

Agtechs are creating indoor vertical “smart farms” that outproduce traditional flat farms by nearly 400%

By Andrew Prochnow



Going vertical at Plenty's farm in South San Francisco.

Imagine a future when an acre of farmland yields 400 times as much food as it produces today. Now, stop imagining. The necessary technology has already arrived.

Welcome to the indoor vertical smart farming revolution. Unlike greenhouse farming—which relies on natural sunlight—smart-farming takes place in fully enclosed, climate-controlled structures that use LED lighting to accelerate growth.

And while a commercial warehouse may not rival amber waves of grain when it comes to inspiring song lyrics, the early returns from indoor farming suggest its superior efficiency may transform the industry.

## Upending tradition

The vertical aspect of indoor farming is flipping traditional farming on its head. Instead of sowing seeds in vast, flat outdoor fields, vertical farmers nurture crops in layers stacked from floor to ceiling.

Vertical farming typically leverages “soilless” techniques, such as hydroponics, aquaponics and aeroponics—methodologies that substitute mineral-nutrient solutions for dirt. That’s one reason vertical farms need only two acres to outproduce traditional farms of 720 acres.

What’s more, indoor crops are less susceptible to extreme or unexpected weather. Indoor farms operated in existing buildings disrupt the natural environment less than annual plowing and tillage on large tracts of land. Soil erosion from wind and rain becomes a thing of the past.

## Rise of the agtechs

A San Francisco-based privately held startup called Plenty is helping to lead the vertical farming revolution. Plenty’s cutting-edge approach incorporates robotics and artificial intelligence (AI) into indoor farming to maximize efficiency.

With AI—which might be best characterized in indoor agriculture as “machine learning”—Plenty optimizes variables such as light,



temperature and humidity. For example, AI can fine-tune the amount of blue, white and red light used in the growing process. AI can theoretically learn on the fly, tweaking the model to improve future harvests.

Plenty's high-tech approach illustrates another trend in the sector: smart farming. And while not every farm is equipped to use AI and robotics, many farmers are installing digital sensors and interconnected networks to assist with crop monitoring, diagnostics and decision-making.

Agtechs that have integrated best practices from indoor and smart farming have produced eye-popping efficiency. The most sophisticated vertical smart farms use 95% less water and 99% less land than traditional flat farms.

Importantly, however, the efficiencies aren't cheap—at least not without scale.

The gadgets powering vertical smart farms, particularly the LED lighting and climate controls, come with a substantial price tag. A vertical smart farm requires 14 times more energy per square meter than a traditional farm, according to a study in the United Kingdom.

That's a substantial difference in terms of financial costs and for the environment. Unless indoor farms are powered by renewable energy, producing the electricity they require could generate significant greenhouse gas emissions.

But the high costs of indoor smart farms haven't scared away investors. Crunchbase estimates that investors lavished more than \$4 billion in fresh capital onto agtech startups during 2020. Listed are some of the highest-profile agtech startups in North America:

**Freight Farms** a Massachusetts-based company using shipping

containers to build vertical farms at schools

**AeroFarms** a New Jersey-based agtech building patented aeroponic growing systems

**Elevate Farms** a Canada-based vertical farm company providing remote parts of Canada with fresh produce

**Kalera** a Texas-based vertical farming company set to open the largest vertical farm in Hawaii

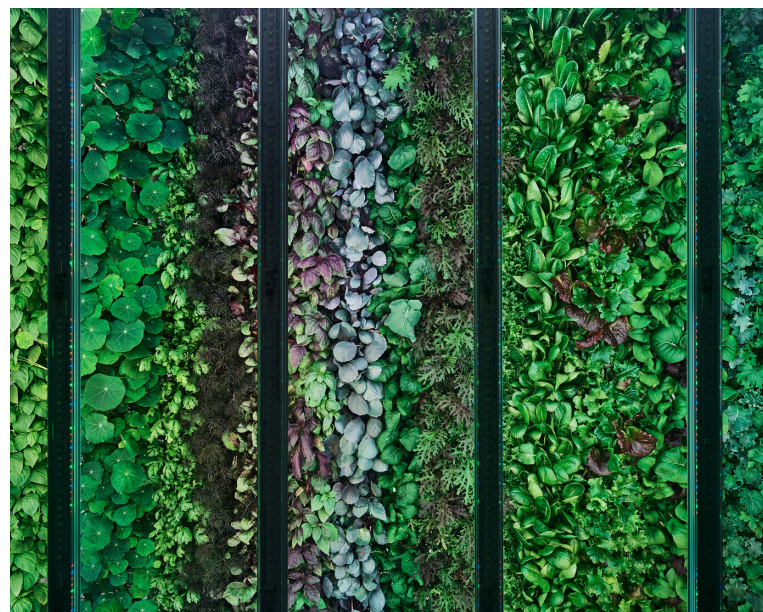
**BrightFarms** a New York-based agtech in the indoor, controlled-environment leafy greens segment

**Bowery** a Pennsylvania-based vertical farming operation that developed its own proprietary software, BoweryOS, to monitor crops from seed to harvest

Any of the firms listed might go public this year via an initial public offering (IPO) or through a merger with a special-purpose acquisition company (SPAC).

In a promising sign for agtech startups, a large established agricultural player signed a groundbreaking deal with Plenty last October. Driscoll's, a California-based company with a controlling interest in about one-third of the \$6 billion U.S. berry market, announced it had reached an agreement with Plenty to produce strawberries year-round at Plenty's Laramie, Wyoming, location.

Leadership at Driscoll's was apparently so impressed with what they saw at Plenty that the berry producer also decided to take an ownership stake in the company. That investment also closed last October, during a new Series D round of funding led by **Softbank** (SFTBY).



### The big players

Investors and traders interested in the agricultural sector would be well-advised to monitor other large players to see whether they sign deals with agtech startups, invest additional funds in them or create their own smart or indoor farming divisions, analysts advise.

A short list of well-capitalized, publicly listed companies in the agricultural sector includes **Archer Daniels Midland** (ADM), **AGCO Corp.** (AGCO), **Bunge Limited** (BG), **Calavo Growers** (CVGW), **CF Industries** (CF) and **Fresh Del Monte** (FDP).

**LG Electronics** and **General Electric** (GE) are said to be striving to turn indoor farming into the next big home appliance category—a sign that advances in agtech may represent the beginning of a broader transformation. 📦

**Andrew Prochnow**, a longtime options/volatility trader, has contributed extensively to *Luckbox*, *Bleacher Report* and *Yahoo!Sports*.

▲ A wall of vertical greens grows at Plenty's South San Francisco farm.

**A two-acre vertical farm can raise as much food as a 720-acre traditional horizontal farm.**

**The most sophisticated vertical smart farms use 95% less water and 99% less land than flat farms.**



## LIQUID ASSETS

# A Difficult Year for Distilled Spirits

By Jeff Joseph

Americans in COVID-19 lockdown changed the modes and means of their drinking habits in 2020, resulting in many losers and some surprising winners in the alcohol sector.

Homebound alcohol consumption spawned the “quarantini cocktail,” even as the market for liquor imploded and spirits companies saw net revenues plunge. Hundreds of thousands of bar and spirits industry workers lost their jobs as bar stools sat vacant and bottle service became just a fading memory.

Other notable casualties include an estimated 6,500 American bars, including the 60-year-old Saturn Bar in New Orleans’ Ninth Ward and the venerable Grey Lodge Pub in Northeast Philly—both recently named among the world’s 50 best bars.

New craft spirits distillers were hit particularly hard by the absence of the on-premise venues they need to introduce their brands to new consumers. They lost an estimated \$700 million in sales, or 41% of their total.

At least they received an 11th hour Christmas reprieve when Congress included a permanent reduction in federal excise taxes for small craft spirits distillers and importers in the \$908 billion COVID-19 aid package. “Moonshine” played a role in achieving the bipartisan agreement as Sen. Joe Manchin, D-W. Va., shared a Mason jar filled with 170-proof “farm fuel” to warm up his colleagues and promote the spirit of compromise.

Another surprise was the growing number of 0% ABV ready-to-drink “mocktails” that were launched in 2020. For the record, *Luckbox* does not approve. 🍸

## 2020’s Buzziest Booze

### Sweetens Cove Tennessee Straight Bourbon Whiskey

Last July, *Luckbox* reviewed a distiller’s sample of Sweetens Cove just before its public release. Our enthusiastic rating still stands. Not only is this 13-year-old Tennessee Bourbon superb, but it bears the name of a storied golf course and has the backstory of quarterback Payton Manning’s ownership interest. Berries, pecan and a full range of black pepper and spices at the outset followed by a big finish of dark cherry and dark chocolate.

[sweetenscovespirits.com](http://sweetenscovespirits.com), \$179  
(If you can find it.)



### Vamonos Riendo Maguey Mezcal

Among the more eye-catching packages released in 2020, this mezcal backs its stylish bottle with substance. A blend of eight-year-old espadin and 14-year-old tobala agaves propel citrus fruit forward with smoky undertones, followed by a whiff of vanilla and cacao milkshake to sweeten the finish. Smokiness is apparent but does not dominate this mezcal. Complex but approachable.

[vamonosriendomezcal.com](http://vamonosriendomezcal.com), \$59



### BenRiach “The Twelve” 12-Year-Old Single Malt Scotch Whisky

BenRiach Distillery’s whisky-making heritage dates back to the late 1800s, but its late 2020 launch of four new lightly peated scotch whiskies has caught our attention.

This 12-year-old is *our favorite new scotch*. Dried fruit dissipates into a very dark chocolate. Each of the three finishes—sherry, bourbon and then port—announce their presence to your palette, leaving behind a smoky maple honey sweetness.

[benriachdistillery.com](http://benriachdistillery.com), \$49



### Starward Solera Single Malt Whisky

The appeal of this Australian craft-distilled whisky lies with its apera barrel finish. Apera is a fortified wine, like sherry, that is native to Australia. Apera often finishes in its barrels for decades, accounting for the dominant malty sweet, banana, honey, fig and pinot-like palette that unmistakably emerges. While we appreciated the creamy smoothness, we welcomed more nuance. A nice gift to receive but did not make our shopping short-list.

[Us.starward.com.au](http://us.starward.com.au), \$49





PHOTOGRAPH: GARRETT ROODBERGEN

Craft spirits distillers lost an estimated \$700 million in sales in 2020.

The at-home bartending trend has focused on classic cocktails, including margaritas, which has given Mexican spirits a boost.

Southern spirits head north  
 Tequila **+22%**  
 Mezcal **+57%**  
 Source: 2020 YoY Sales, drizly.com



## BOOK VALUE

# The *Luckbox* Bookshelf

New and not-so-new books that captured our attention this month

## The Bell Curve: Intelligence and Class Structure in American Life

By Richard J. Herrnstein and Charles Murray

*The Bell Curve* (1994), by Richard Herrnstein and Charles Murray, uses empirical statistical analysis to quantify variations in intelligence among races. The authors cite factors that might explain the gaps they observe, and they warn of the consequences for society if these inequities are not addressed. Their controversial findings touched off a firestorm in academia and the media, and the book sold more than 400,000 copies in the first few months after publication.

The book illustrates the importance of the *Luckbox* decision to “profile” books instead of reviewing them (see panel below). Any reviewer who would assert that the data science community has never refuted the data Murray uses to quantify gaps in intelligence would be targeted immediately by social justice warrior trolls with itchy Twitter fingers.

On the other hand, the idea that the authors tacitly condoned racial prejudice by failing to answer provocative questions about the two factors they said cause the gaps—environment and genetics—would offend readers who derived their own misguided conclusions regarding the source of disparities among the races.

Far too often, book reviews drive away readers. But reviews present just one stranger’s view, and taking them to heart leaves great books undiscovered. *The Luckbox Bookshelf* offers profiles instead of reviews. Don’t look to these pages for opinions. Think of *Bookshelf* as a place to discover books that educate, entertain and challenge entrenched beliefs.

Book rankings are accurate at press time and subject to change.

As Albert Einstein rightly scolded academia, “information is not knowledge.” Real knowledge is the synthesis of information with experience, context and values. Even if one accepts the book’s data and information as sound, *The Bell Curve* comes up short by failing to assign attribution—let alone prescribe solutions—to the variances the authors observed. Moreover, the authors made no attempt to steer readers away from prejudiced conclusions.

So why did *Luckbox* add *The Bell Curve* to its bookshelf? For the same reason you’d find volumes by Hayek, Keynes, Hitler, Darwin, Marx and Engels, not to mention the *Bible*, the *Koran*, Carson’s *Silent Spring* and Cornwell’s *Hitler’s Pope*.

Great bookshelves, like great choirs, rely on the strength of their individual voices.

Amazon Best Seller Ranking  
#10 in Demography Studies

## The Cult of Smart: How Our Broken Education System Perpetuates Social Injustice

By Fredrik deBoer

In *The Cult of Smart: How Our Broken Education System Perpetuates Social Injustice*, leftist educator Fredrik deBoer makes the case for a completely new approach to education in America.

Too many students simply don’t have the intellect or motivation to succeed in an academic environment, deBoer writes. Forcing them to suffer through years of study serves no one.

Instead, schools should accommodate weaker students by loosening standards and providing more paths toward declaring themselves educated.

The time has come to stop blaming the schools for failing to prepare students for

good jobs, when the fault actually lies with an economic system that no longer provides opportunities for graduates with less-than-stellar credentials, DeBoer writes.

Some have claimed that the book’s recommendations don’t square with left ideology, but deBoer argues that they fit with Marxism’s scientific rationalism, empirical approach to history and desire to use reason to promote human emancipation.

Vulture’s No. 7 Best Book of 2020

## Transcend: The New Science of Self-Actualization

By Scott Barry Kaufman

In all of his writings, Scott Barry Kaufman aims to examine self-actualization without falling into the trap of self-help. In his new book, *Transcend: The New Science of Self-Actualization*, he avoids offering guru-like directives, instead urging readers to determine and pursue their own paths to the good life.

*Transcend* emerged from the unfinished work of the late Abraham Maslow, creator of Maslow’s hierarchy of needs. Kaufman pieced together and expanded upon the archives of unfinished writings that Maslow left behind upon his death.

The public has embraced the hierarchy Maslow laid out in a 1943 paper but has failed to understand it, according to Kaufman. Maslow placed food and water at the bottom of the hierarchy and self-actualization at the top. Management consultants who’ve written about the hierarchy illustrated it first as a ladder and later as a pyramid with varying levels dictated by society. Maslow actually thought of self-actualization as a direction one might choose to travel, taking two steps forward and one step back, Kaufman writes.

## What is Intelligence?: Beyond the Flynn Effect

By James R. Flynn

The late intelligence researcher James Flynn documented the fact that IQ scores have been rising steadily ever since the tests came into use more than a century ago. He also established that it's not some isolated phenomenon, tapping sources from 30 countries for his research.

Flynn's accomplishments were recognized in the academic community when the upward trend was named the Flynn effect. But the New Zealand-based professor didn't rest there. As he suggested by the title of his 2007 book, *What is Intelligence?: Beyond the Flynn Effect*, he continued his exploration of intelligence.

One by one, Flynn refuted every point made by researchers who accepted the notion that gaps in IQ scores among racial groups were due to anything genetic. He maintained that the differences were related to environment and would disappear as opportunities expanded for people from different groups.

## Why We Sleep: Unlocking the Power of Sleep and Dreams

By Matthew Walker

Just about everything good gets better with proper slumber, Matthew Walker writes in *Why We Sleep: Unlocking the Power of Sleep and Dreams*.

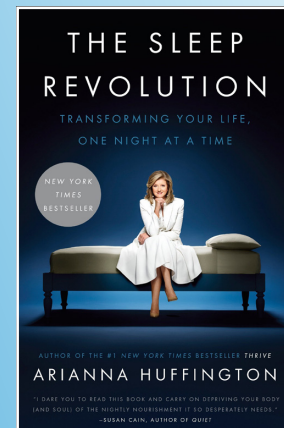
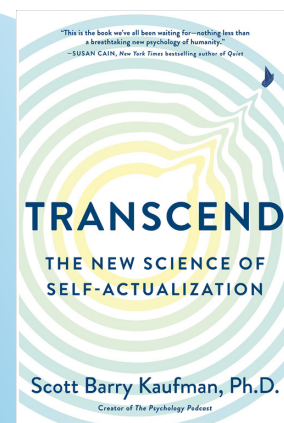
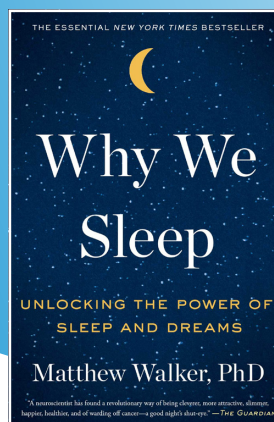
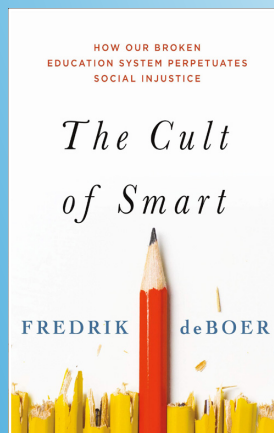
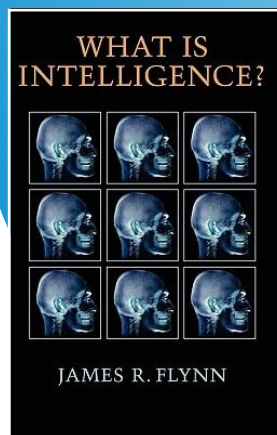
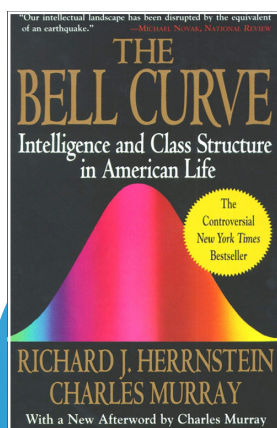
Sleep promotes learning, improves memory, boosts energy, relieves stress and counteracts depression.

It also regulates metabolism, controls hormones, fine-tunes appetite, fights Alzheimer's, lessens the risk of diabetes and might even prevent cancer.

Enough? How about slowing the effects of aging and increasing longevity? What's more, good sleep habits create the right conditions for dreaming, which sets the stage to reconcile the past with the present.

So how does one exploit those advantages? Walker offers actionable advice, including steps to take to get the best night's sleep.

Amazon Best Seller Ranking  
#3 in Pulmonary Medicine  
#18 in Sleep Disorders



## The Sleep Revolution: Transforming Your Life, One Night at a Time

By Arianna Huffington

Americans just don't take sleep seriously enough, according to former editor-in-chief of *The Huffington Post* Arianna Huffington. No, sleep isn't just a waste time. It's vital.

But the nation's cavalier attitude toward sleep has precipitated a crisis, Huffington writes. That's why she's calling for a "sleep revolution."

To combat the culprits depriving the citizenry of a good night's sleep, she's taking

on the sleeping pill makers. She's also urging everyone to clear their bedrooms of the screens that rob them of their ability to relax into slumber.

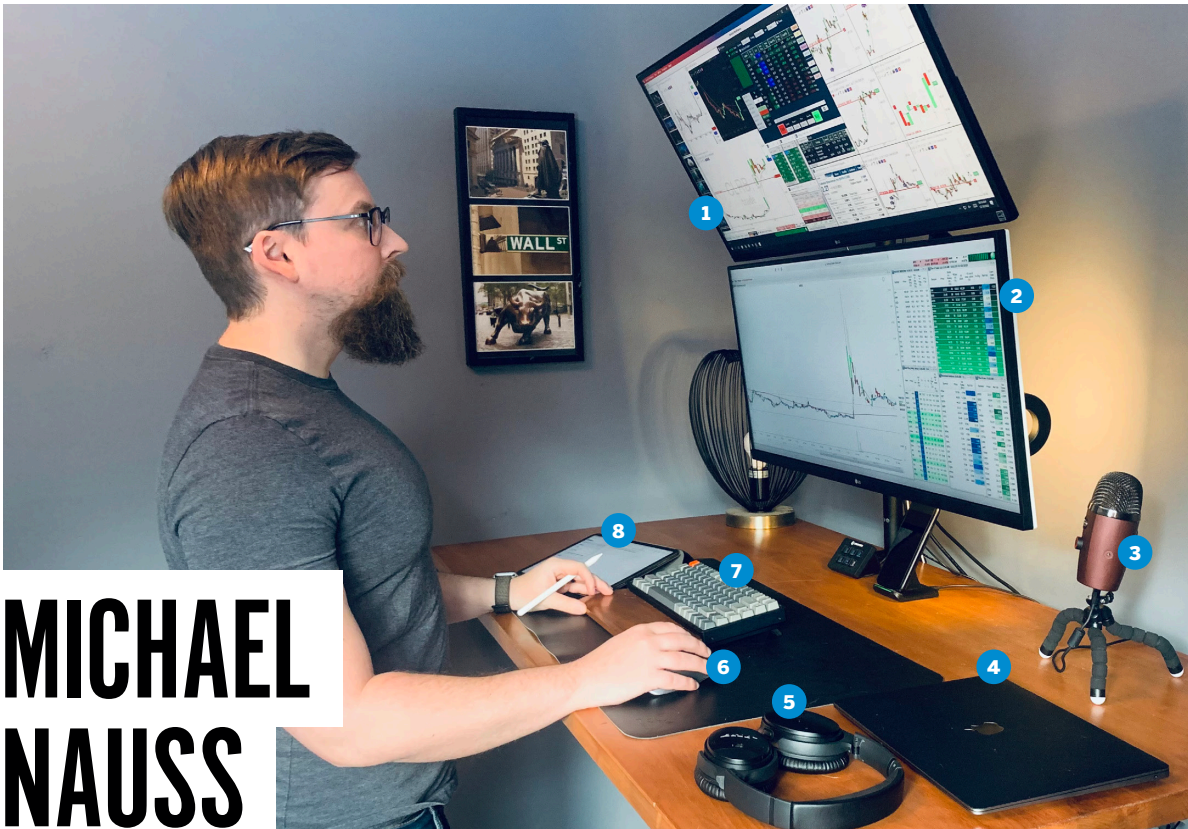
Huffington addresses the downside of sleeplessness, including weight gain, diabetes, Alzheimer's, heart disease and cancer. There's also plenty of scientifically grounded information in her book on the importance of dreams and the restorative power of sleep.

In her view sleep serves as a gateway to a life of wonder, well-being and giving.

New York Times Best Seller



TRADER



# MICHAEL NAUSS

1. Trade ideas program across both monitors, used for trading and backtesting
2. Monitors are both LG 34-inch ultra-wide monitors 34wk650
3. Yeti Nano microphone
4. M1 MacBook Air with 16 gigs of ram for travel
5. Bose QC35 headphones
6. Logitech MX Master 2 mouse
7. Keycron k2 keyboard
8. 11-inch iPad Pro for note-taking and mobile trading

Trader/Consultant, @bonpara

Age 35

Office Halifax, Nova Scotia

Years trading 15

**How did you start trading?**

It was a very random occurrence during a job fair at university. A proprietary trading firm was looking for people in finance to scalp at their firm. After the first few days, I was hooked. The ability to solve puzzles for a job was a joy, and I knew this was what I would be doing for a living.

**Favorite trading strategy?**

I am a systematic trader. I build systems using a trade ideas backtester and the ability to autotrade to remove the emotion of trading and to allow me to quantify my edge. My

basic strategy is to use trade ideas to find stocks stronger and weaker than the overall market and then test patterns to get involved in that relative strength and weakness. Then I allow the system to deal with trade entry and management.

**Average number of trades per day?**

Three

**Favorite trading moment?**

My best trading moment has nothing to do with a single trade or stock. It was a conversation I had with another group of successful traders while travelling. We were comparing strategies and win rates. I noticed that we were all around the same when it came to stats. The traders doing the best were simply the ones with the best risk management. This completely flipped my focus on trading so that I was focused on risk

over everything else.

**Worst trading moment?**

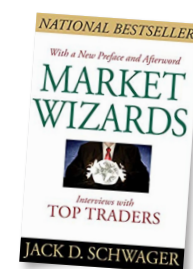
Like most traders, I blew up an account early in my trading career. It was wild risk with no stops and no thought of what I would do if things went wrong. In those moments, you need to have a hard look at yourself and your goals. If you find yourself blaming anything but your trading and your own decisions, then you are not ready to trade for a living.

**What percentage of your outcomes do you attribute to luck?**

All outcomes in trading are probabilistic (luck) based. I believe that 100% of our job as traders is to make sure to understand the math and make sure to limit the downside each time you have bad luck—and capitalize as much as you can every time you have good luck. 🎲

**FAVORITE TRADING BOOK**

All of the *Market Wizards* books. The series examines the style and methods of traders from all over the world.



## CALENDAR

## FEBRUARY

- 2 Groundhog Day**
- 7 Super Bowl LV**  
Tampa
- 14 63rd Daytona 500**  
Daytona Beach, FL
- 14 Valentine's Day**
- 15 Presidents' Day**  
Market holiday
- 16-18 MoneyShow Virtual Expo**  
Online event

**MoneyShow Virtual Expo**

Individual investors, active traders and financial advisors can all take advantage of expert investment advice at MoneyShow's Virtual Expo. Billed as the "one-stop forum for clear, concise and carefully crafted advice" for the volatile trading environment, the expo brings market enthusiasts together to discuss the issues and opportunities that will shape trading portfolios now and into the future. Co-CEO of tastytrade, Tom Sosnoff, will hold a live 30-minute demonstration on Feb. 16, and tastytrade will have a virtual booth throughout the event.

**National Absinthe Day**

There's no better time to give absinthe a try than on National Absinthe Day. Also known as "the green fairy" or "the green lady," absinthe is an uncommon spirit made by infusing wormwood, anise, fennel, and other herbs and spices during the distillation process. Its green botanical hue and high alcohol content make it stand out among other spirits. The myth continues to circulate that absinthe possesses hallucinogenic properties, but studies have disproven those claims. Just the same, absinthe was banned in the United States from 1912 to 2007. There's a great deal of ritual involved in preparing absinthe properly, a process known as "louching," but those willing to give it a try quickly realize why absinthe was so popular before it was prohibited. And they'll see why Dutch painter Vincent van Gogh was a fan.



## MARCH

- 2-4 Microsoft Ignite**  
Online event
- 5 National Absinthe Day**
- 10-14 Big Ten Men's Basketball Tournament**  
Chicago
- 16-20 SXSW Online 2021**  
Online event
- 20 Vernal Equinox**  
First day of spring
- 28 WrestleMania 37**  
Tampa

**SXSW Online 2021**

Last year's South by Southwest, or SXSW, conference was canceled amid COVID-19 concerns—the first cancellation of the event since its inception in 1987. This year, SXSW is going digital. One pass covers the entire event, enabling attendees to take advantage of the conference sessions, keynotes, music festival showcases and film festival screenings that have made the conference famous. Featured speakers include *New York Times* bestselling author Michael Lewis, DEVO co-founder Mark Mothersbaugh, world-class tennis champion Maria Sharapova and Reddit COO Jen Wong, among many others.



Megan Thee Stallion performs at 2019 SXSW

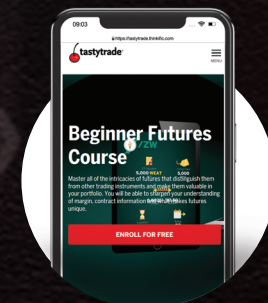






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# tactics

essential trading strategies

## BASIC

# More Than Semi-Tough

Stocks and exchange-traded funds offer opportunity in the semiconductor sector

By Michael Rechenthin

In keeping with this issue's focus on intelligence, let's explore the recent history of stock in companies that manufacture the brain of the computer: semiconductors. It's one of the best-performing sectors of 2020.

Some of the best semiconductor exchange-traded funds (ETFs) and an assessment of each one are included in "Noteworthy ETFs," right.

As shown on the chart in "Strong performers," p. 48, from the March 2020 low, semiconductors (SMH and SOXX) outperformed both the Nasdaq (QQQ) and the S&P 500 (SPY).

Because ETFs include individual stocks, the 10 most popularly traded semiconductor stocks are listed in "Plenty of action," p. 48.

**Advanced Micro Devices (AMD)** and **NVIDIA Corp. (NVDA)** trade the most at nearly \$4 billion worth of stock per day. That makes the liquidity of both phenomenal.

The biggest semiconductor in terms of market capitalization, **Taiwan Semiconductor Manufacturing (TSM)**, is at nearly \$500 billion, and it trades an average of nearly \$900 million worth of stock a day.

Everything on the list, with the exception of **Intel (INTC)**,

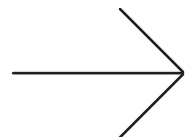
## Noteworthy ETFs

Seeking a semiconductor exchange-traded fund? Think of this primer on four ETFs as a place to start.

Symbol - Description	Tradeability	Our Take
<b>SMH:</b> VanEck Vectors Semiconductor ETF	✓	Trades an average of \$500 million in shares a day—so liquidity is there. The options market is also ideal with a tight (narrow) bid and offer. Open interest is also high.
<b>SOXX:</b> iShares PHLX Semiconductor ETF	✓	Trades an average of \$175 million in shares a day. The options market does have a tight bid and offer, but the open interest is low.
<b>PSI:</b> Invesco Dynamic Semiconductor ETF	✗	No options. Trades less than 100,000 shares per day. Avoid this ETF until liquidity improves.
<b>XSD:</b> SPDR S&P Semiconductor ETF	✗	State Street has nearly \$1 billion under management for this ETF, but it has relatively poor liquidity, and options are not available, either. Avoid this ETF for now and until liquidity improves.

performed well during the past year. That creates a potential opportunity—buying the weakest stock on the list. Traders can use one of several methods to accomplish it. 📦

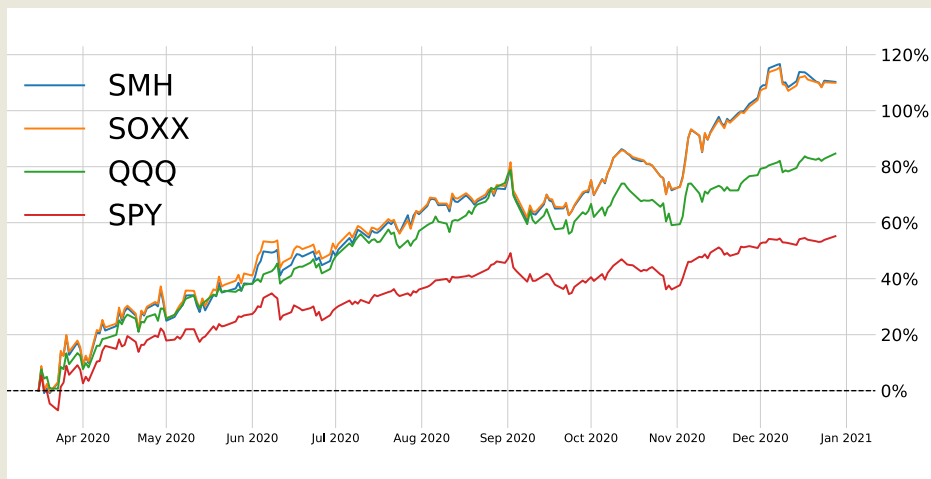
**Michael Rechenthin, Ph.D.**, aka "Dr. Data," is the head of data science at tastytrade.





### Strong performers

Two semiconductor ETFs outpaced both the S&P 500 and Nasdaq much of last year.



AMD and NVDA trade nearly \$4 billion of stock per day ... that makes the liquidity of both phenomenal

### Plenty of action

Heavy trading volume of popular semiconductor stocks creates liquidity and opportunity.

Symbol	Description	Price	Average Daily Traded	Market Cap	1-Year Price Return
AMD	Advanced Micro Devices, Inc.	91.60	3,720,814,534	110,168,417,364	87%
NVDA	NVIDIA Corp.	516.00	3,698,524,428	319,404,000,000	117%
INTC	Intel Corporation	47.07	1,725,158,145	192,892,858,749	-23%
QCOM	Qualcomm, Inc.	147.74	1,258,837,285	167,093,946,212	68%
MU	Micron Technology, Inc.	70.66	1,208,340,691	78,660,270,596	27%
TSM	Taiwan Semiconductor Mfg. Co. Ltd.	106.15	866,113,835	471,959,996,934	76%
AVGO	Broadcom Inc.	431.88	736,871,497	175,651,212,425	34%
TXN	Texas Instruments Inc.	161.47	627,560,744	148,220,095,860	25%
LRCX	Lam Research Corp.	476.10	624,629,393	68,562,685,778	61%
AMAT	Applied Materials, Inc.	84.87	567,363,419	77,600,377,791	37%

### Strategy session

Traders have more than one way to play Intel's upside.

Strategy	Specific	Probability of Profit	Max Profit	Max Loss
Bullish short put	Sell the 40 put in April for roughly 1.06	79%	\$106	-\$3895
Bullish debit call spread	Buy the 45 call and sell the 47.5 call for a debit of 1.27	50%	\$123	-\$127
Bullish credit put spread	Sell the 45 put and buy the 42.5 put for a credit of 0.90. Do this in April.	60%	\$90	-\$160





**Talking heads.**  
**Their time is up.**  
**It's our time now.**

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7:00a - 10:00a CT

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10:00a - 10:30a CT

## The LIZ & JNY Show

10:30a - 11:30a CT

## Market Mindset

11:30a - 12:00p CT

## Splash into Futures

12:00p - 1:00p CT

## From Theory to Practice

1:00p - 1:30p CT

## The tastytrade Learn Center

1:30p - 1:40p CT

## IN or OUT

1:40p - 2:00p CT MON

## Research Specials Live

1:40p - 2:00p CT TUE-THU

## This Week in Stocks

1:40p - 2:00p CT FRI

## BAT vs. BAT

2:00p - 2:15p CT

## Trading the Close

2:15p - 2:30p CT

## Last Call

2:30p - 3:00p CT

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# CHEAT SHEET #12

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## Metrics & Mechanics

Alleviate the guesswork and reduce the risk of trade decision-making. **By Mike Hart**

The market reacts to the decisions of millions of traders and even expresses their emotions. It does both by establishing equity prices from moment to moment. That's why a well-defined set of mechanics can help alleviate the guesswork of trade decisions. This cheat sheet was created with those mechanics in mind.

First, consider **size consistency**. As one reviews the metrics and plays through the scenarios and outcomes, the game of multiples begins to occur. Take what a trader might make on a one lot position and multiply it by 10 to reflect how sweet the outcome could be. In the table to the right, size emerges as a hidden danger: Put on too much and give the profit away. Stay consistent with size. While the hope of a significant return is seductive, the reality of a big loss can make for a bad day.

This observation also fits for the **duration**. Consider moderation. Forty-five days is the magic number to maximize theta decay. So, we place a trade between 30 and 60 days.

Find **proper allocation**. Failure to do so can lead to missed opportunities and excessive risk. Use the table as a guide for allocation of defined- and undefined-risk trades.

Finally, don't guess **when to get out of a trade**. Follow the rule of 50% or 21 days: If the trade reaches 50% of max profit, then it's time to close out. But, either way, always close out at 21 days.

Research has established that consistent trade mechanics improve profits and heighten the probability of success. Consistency keeps traders on track and in the game, ultimately limiting guesswork in trade decision-making. 📦

**Mike Hart**, a former floor trader at the Chicago Stock Exchange and a proprietary futures trader, specializes in energy markets and interest rates. He's a contributing member of the tastytrade research team. @mikehart79



**Active Investor Alert!**

Follow @mikehart79 on Twitter for daily trading ideas and tactics.

Look at **size** not only through the lens of profits but also potential losses.

One oversized loss can negate the profits of many consistent risk-controlled trades.

Size	Credit	P/L
1	\$2	\$100
1	\$2	\$100
3	\$2	-\$600
1	\$2	\$100

**Duration** should have an overall consistency. Aim for a duration that maximizes efficiency of returns.

The value lost daily, or what's called the velocity of decay, isn't constant. The option begins to lose value at a greater rate around 45 days to expiration.

### Mechanically Consistent Trade Decisions

Improper **allocation** of an account can result in missed opportunities and excessive risk.

Total allocation ranges:

Defined risk  
Between 0.5% and 3% per trade

Undefined risk  
Between 3% and 10% per trade

Probability of success increases with consistent **management of risk** at 50% and 21 days to expiring.

S&P 500 (45 DTE) 2005 to Present Sold 1 SD Strangles	Daily Profit	Risk
Expiration	\$1.55	\$400
50%	\$3.75	\$265
21 Days	\$4.00	\$175



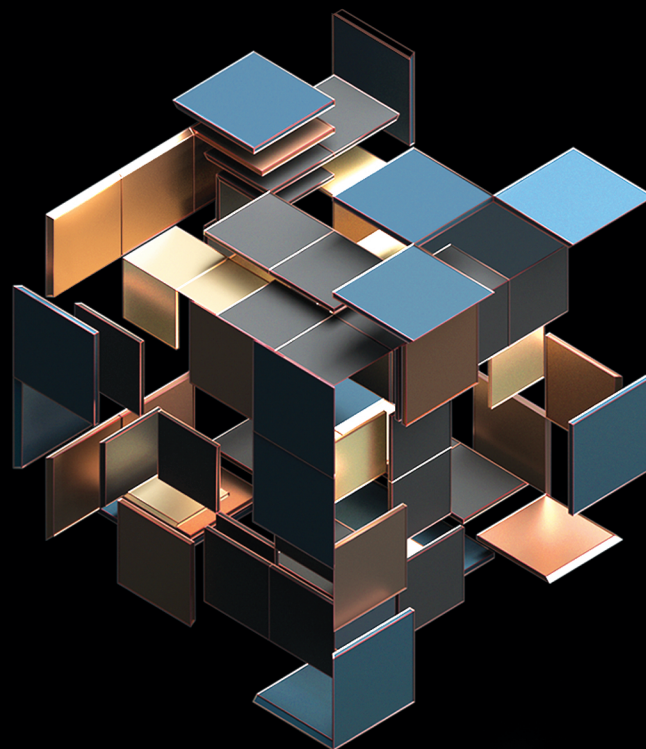
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## INTERMEDIATE

# The Semiconductor Trade: Correlation & Volatility

The sector yielded startling increases last year, but it's not right for every portfolio

By Anton Kulikov

Semiconductors have become increasingly popular with traders because of the sector's deep liquidity and potential for large moves. Let's examine the two largest exchange-traded funds, or ETFs, that track semiconductors: iShares PHLX Semiconductor ETF (SOXX) and VanEck Vectors Semiconductor ETF (SMH).

In 2020, those two ETFs returned around 53%, and that includes the big dip last March. In fact, from their March 18, 2020 lows to the beginning of this year, the two were up more than 100%. Although those returns are far from average, two questions may arise: "Is this growing sector a good fit for my portfolio? If so, how much should I add?"

To answer those questions, look at two metrics: correlation and volatility. Correlation answers whether semiconductors are a good fit for a particular portfolio, and the volatility of semiconductors shows how much to add.

First, look at the last three months' correlation between SMH, SOXX and other assets: SPY (the equity market), FXE (the currency market), USO (oil), TLT (fixed income) and GLD (metals). To decide if semiconductors are a good fit, determine how the portfolio looks and its exposure. In other words, if the portfolio has a lot of equity exposure, then semiconductors may not be the best fit because SPY and SMH/SOXX are highly correlated. They therefore provide little to no diversification.

However, if the portfolio is heavy on any other asset, then the semis may be a good fit because the semiconductor ETFs have very low correlation with everything except the equities market.

Semiconductors are quite volatile. In fact, they display about 1.5 times the expected volatility of the S&P 500. The only asset more volatile than semiconductors at the moment is oil, with an expected volatility two times the S&P 500's.

So, when adding semiconductors to a portfolio, add about half as much as the largest current position to make the movements from semiconductors approximately the same as the other positions. For example, if a trader has a \$10,000 portfolio of GLD, add just \$5,000 of SMH or

## Three-month price correlations

Semiconductor exchange-traded funds display low correlation with everything except the equities market.

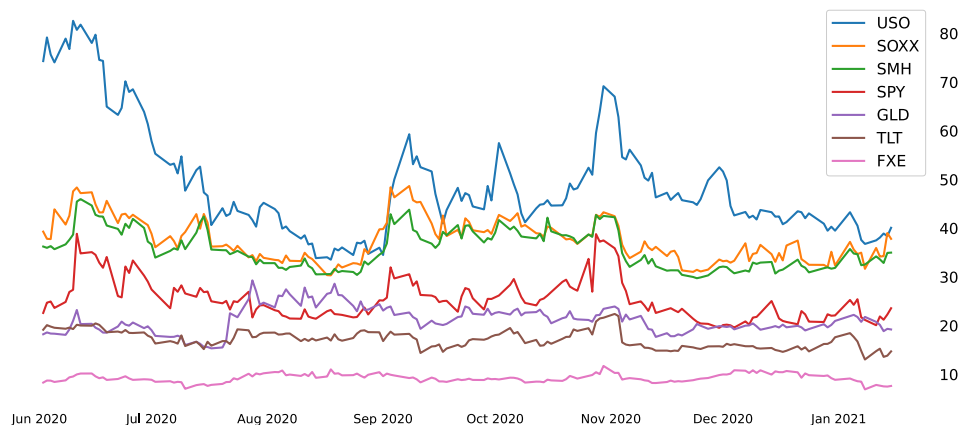
SOXX	1.00
SMH	0.99
SPY	0.80
FXE	0.35
USO	0.10
TLT	-0.12
GLD	0.26

SOXX to get the same magnitude of movements as GLD, because GLD is half as volatile as the semis. 📊

Anton Kulikov is a trader, data scientist and research analyst at tastytrade. @antonkulikov97

## Highly volatile

Semiconductors offer about 1.5 times the expected volatility of the S&P 500. Right now, the only asset more volatile than semiconductors is oil.





ADVANCED

# Tips for Trading Microchips

Semiconductor stocks offer high volatility and extraordinary liquidity

By Michael Gough

Tech stocks were the market to buy in 2020. While Covid-19 crippled many sectors, technology stocks bloomed with a 40% rally from the start of 2020 to the beginning of this year. (See *Active market, big potential, below*). But “technology” has become a catch-all term, so let’s dig more deeply into which subsectors and components contributed to this growth.

According to the Technology Select Sector SPDR ETF (XLK), the tech sector has six subsectors: software, IT services, communications equipment, technology hardware, electronic equipment and semiconductors.

**Top option**

Perhaps surprisingly, the largest component and best-performing single stock from the subsectors was **NVIDIA Corp.** (NVDA), a semiconductor company. NVIDIA had the greatest performance in 2020 against the other representatives, trading higher by nearly 125%. (See *“Stellar performance, p. 53*).

Semiconductor stock names may not sound as familiar as Google, Apple or Amazon, but they are frequently ranked as some of the most volatile companies with

extraordinary liquidity in their outright, ETF and options markets. It makes them worth putting on a watchlist. The combination of high volatility and deep liquidity makes them favorable candidates for active traders and passive investors alike.

**Advanced pick**

For single stocks besides NVIDIA, check out **Micron Technology** (MU) and **Advanced Micro Devices** (AMD). Or, try gaining exposure through multiple names with an exchange-traded fund, such as VanEck Vectors Semiconductor ETF (SMH). There are also index futures on the Nasdaq or the new Small Technology 60, both of which have exposure to NVIDIA and other semiconductor stocks.

When deciding whether to trade outright stock, options, ETFs or futures, stay product-indifferent

while keeping in mind the pros and cons of each. For example, a potential advantage of trading outright single stocks is that they tend to exhibit higher volatility compared with ETFs or index futures.

**Not always the right choice**

However, that can also be a potential drawback, as single stocks are subject to firm-specific risks—such as an earnings release—whereas funds and index futures provide exposure to many names. So losses in one company may be offset by gains in another.

In addition, consider the cost and movement of each product. ETFs may be explicit with their exposure but tend to be much slower-moving and require a much larger capital outlay than options or futures.

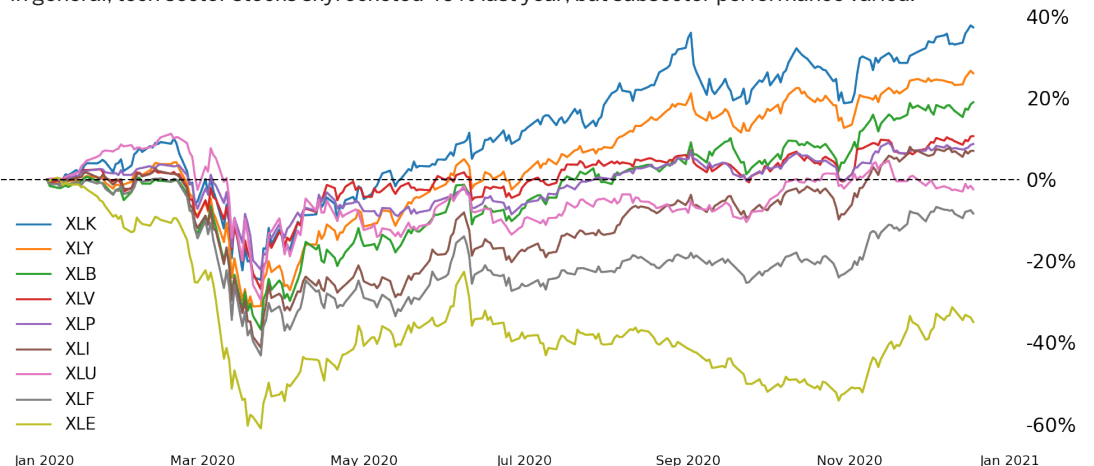
The combination of above-average volatility and robust liquidity



**THYNG**  
Learn more about single stock volatility

**Active market, big potential**

In general, tech sector stocks skyrocketed 40% last year, but subsector performance varied.



Stock in semiconductor companies seems like a prime candidate for short-term scalps or passive investment.

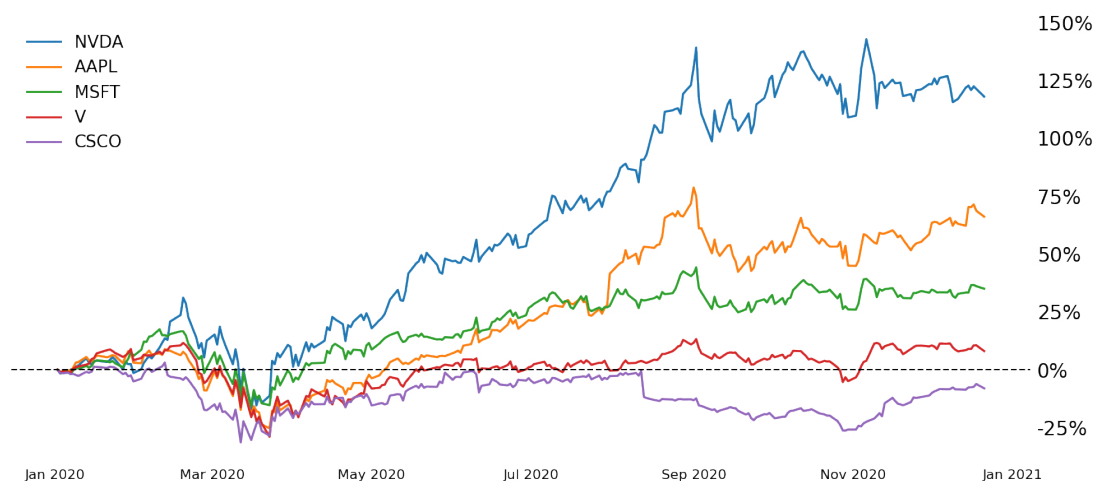
makes semiconductor stocks a prime candidate for short-term scalps or passive investment. To capitalize on intraday movement, look to options and futures that provide terrific potential return on capital and the potential for strategy. To invest, consider stocks or ETFs paired with short options that benefit from the greater volatility. 📦

**Michael Gough** enjoys retail trading and writing code. He works in business and product development at the Small Exchange, building index-based futures and professional partnerships.

**A potential advantage of trading outright single stocks is that they tend to exhibit higher volatility.**

### Stellar performance

Stock in NVIDIA, a semiconductor company, outperformed other representatives of that tech subsector.



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# trades

actionable trading ideas

**CHERRY PICKS** RIPE & JUICY TRADE IDEAS

## Volatility “Sweet Spot”

By Michael Rechenthin



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**S**ecurities are ranked on this page according to their forward-looking volatility from last year. Traders seeking safer investments—at least those expected to move less—might lean toward the exchange-traded funds (ETFs) and stocks near the bottom.

Options traders looking to add a bit more volatility should consider the symbols or

sectors near the top of the list because they have the biggest expected price movements. Options from the top of the list are also the most expensive and have a slightly greater possibility of having the largest understatement of movement. That means it’s possible to make the most money by selling options in this category.

Routinely, Oil Services (OIH) ranked

among the most volatile sectors, and high volatility engenders high levels of fear. Utilities (XLU), Consumer Staples (XLP) and Health Care (XLV) ranked among the least volatile sectors, with the lowest levels of fear. Consider volatility before taking the plunge. 🍒

**Michael Rechenthin, Ph.D.** (aka “Dr. Data”) heads research and data science at tastytrade. @mrechenthin

### Risk roulette (a 2020 lookback)

Assets near the top of this list carry the most volatility, and those near the bottom display the least. These volatility trends are likely to continue.

Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20
Oil Services (OIH)	Oil Services (OIH)	Oil Services (OIH)	Oil Services (OIH)	Oil Services (OIH)	Oil Services (OIH)	Oil Services (OIH)	Gold Miners (GDJ)	Oil Services (OIH)	Oil Services (OIH)	Oil Services (OIH)	Oil Services (OIH)
Gold Miners (GDJ)	Gold Miners (GDJ)	Metals and Mining (XME)	Metals and Mining (XME)	Gold Miners (GDJ)	Metals and Mining (XME)	Gold Miners (GDJ)	Oil Services (OIH)	Gold Miners (GDJ)	Gold Miners (GDJ)	Metals and Mining (XME)	Gold Miners (GDJ)
Biotech (XBI)	Biotech (XBI)	Gold Miners (GDJ)	Gold Miners (GDJ)	Metals and Mining (XME)	Regional Banking (KRE)	Regional Banking (KRE)	Metals and Mining (XME)	Regional Banking (KRE)	Regional Banking (KRE)	Gold Miners (GDJ)	Metals and Mining (XME)
Metals and Mining (XME)	Metals and Mining (XME)	Regional Banking (KRE)	Energy Sector (XLE)	Regional Banking (KRE)	Gold Miners (GDJ)	Metals and Mining (XME)	Regional Banking (KRE)	Metals and Mining (XME)	Energy Sector (XLE)	Energy Sector (XLE)	Energy Sector (XLE)
Retail (XRT)	Retail (XRT)	Energy Sector (XLE)	Regional Banking (KRE)	Energy Sector (XLE)	Energy Sector (XLE)	Energy Sector (XLE)	Energy Sector (XLE)	Energy Sector (XLE)	Metals and Mining (XME)	Regional Banking (KRE)	Regional Banking (KRE)
Regional Banking (KRE)	Energy Sector (XLE)	Financials (XLF)	Retail (XRT)	Homebuilders (XHB)	Homebuilders (XHB)	Homebuilders (XHB)	Biotech (XBI)	Biotech (XBI)	Biotech (XBI)	Homebuilders (XHB)	Biotech (XBI)
Tech (XLK)	Tech (XLK)	Homebuilders (XHB)	Homebuilders (XHB)	Retail (XRT)	Financials (XLF)	Retail (XRT)	Retail (XRT)	Retail (XRT)	Retail (XRT)	Biotech (XBI)	Homebuilders (XHB)
Energy Sector (XLE)	Regional Banking (KRE)	Retail (XRT)	Financials (XLF)	Financials (XLF)	Retail (XRT)	Biotech (XBI)	Homebuilders (XHB)	Tech (XLK)	Homebuilders (XHB)	Retail (XRT)	Financials (XLF)
Financials (XLF)	Materials (XLB)	Materials (XLB)	Materials (XLB)	Biotech (XBI)	Biotech (XBI)	Financials (XLF)	Financials (XLF)	Financials (XLF)	Tech (XLK)	Financials (XLF)	Retail (XRT)
Homebuilders (XHB)	Financials (XLF)	Industrials (XLI)	Industrials (XLI)	US Real Estate (IYR)	Materials (XLB)	Materials (XLB)	Tech (XLK)	Homebuilders (XHB)	Financials (XLF)	Materials (XLB)	Materials (XLB)
Materials (XLB)	Homebuilders (XHB)	Tech (XLK)	US Real Estate (IYR)	Industrials (XLI)	Industrials (XLI)	Industrials (XLI)	Materials (XLB)	Materials (XLB)	Materials (XLB)	Tech (XLK)	Tech (XLK)
Industrials (XLI)	Industrials (XLI)	US Real Estate (IYR)	Utilities (XLU)	Materials (XLB)	US Real Estate (IYR)	US Real Estate (IYR)	Industrials (XLI)	Industrials (XLI)	Industrials (XLI)	Industrials (XLI)	Industrials (XLI)
Consumer Discretionary (XLY)	Consumer Discretionary (XLY)	Consumer Discretionary (XLY)	Biotech (XBI)	Tech (XLK)	Tech (XLK)	Tech (XLK)	US Real Estate (IYR)	Consumer Discretionary (XLY)	Consumer Discretionary (XLY)	Consumer Discretionary (XLY)	Consumer Discretionary (XLY)
Health Care (XLV)	Health Care (XLV)	Biotech (XBI)	Consumer Discretionary (XLY)	Consumer Discretionary (XLY)	Consumer Discretionary (XLY)	Consumer Discretionary (XLY)	Consumer Discretionary (XLY)	US Real Estate (IYR)	US Real Estate (IYR)	US Real Estate (IYR)	US Real Estate (IYR)
US Real Estate (IYR)	US Real Estate (IYR)	Utilities (XLU)	Tech (XLK)	Utilities (XLU)	Utilities (XLU)	Utilities (XLU)	Utilities (XLU)	Health Care (XLV)	Health Care (XLV)	Utilities (XLU)	Utilities (XLU)
Utilities (XLU)	Consumer Staples (XLP)	Health Care (XLV)	Consumer Staples (XLP)	Health Care (XLV)	Health Care (XLV)	Health Care (XLV)	Health Care (XLV)	Utilities (XLU)	Utilities (XLU)	Health Care (XLV)	Health Care (XLV)
Consumer Staples (XLP)	Utilities (XLU)	Consumer Staples (XLP)	Health Care (XLV)	Consumer Staples (XLP)	Consumer Staples (XLP)	Consumer Staples (XLP)	Consumer Staples (XLP)	Consumer Staples (XLP)	Consumer Staples (XLP)	Consumer Staples (XLP)	Consumer Staples (XLP)



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**FUTURES** A SAVVY FUTURES TRADER'S TAKE ON THE MARKETS

# The Low Bar to Trading High-Action Currencies

By Pete Mulmat

**T**hink of foreign exchange, or FX, as the “cult classic” of asset classes. Compared with investors in mainstream markets—like stocks and commodities—FX traders are fewer in number but certainly more passionate. Whether volatility runs high or low, foreign exchange trading groups buzz with talk of currency crosses and interest rate comparisons.

But traders don't need to jump in head first to reap the benefits of an active market that offers a unique opportunity relative to equities. Plenty of people enjoy the Grateful Dead without feeling the need to abandon their lives to follow Bob Weir and John Mayer around the country.

The U.S. dollar provides a solid place to start, and Small U.S. Dollar Futures (SFX) offer direct access to this singular currency without having to research several cross relationships. The U.S. dollar is at multi-year lows, and it's nearing territory travelled less than 10% of days going back to 2016. Buying SFX here would bank on a reversion to historically normal levels. Small U.S. dollar futures move about +/- 0.50 (\$50) per day, and their margin is only around \$200, depending on the broker. Maybe it's a bit overboard to dress like the Big Lebowski every Halloween, but traders should at least see what all the fuss is about. 🎲

**Pete Mulmat**, chief futures strategist at tastytrade, serves as host for a number of daily futures segments on the tastytrade network under the flagship programming slot called *Splash Into Futures*.

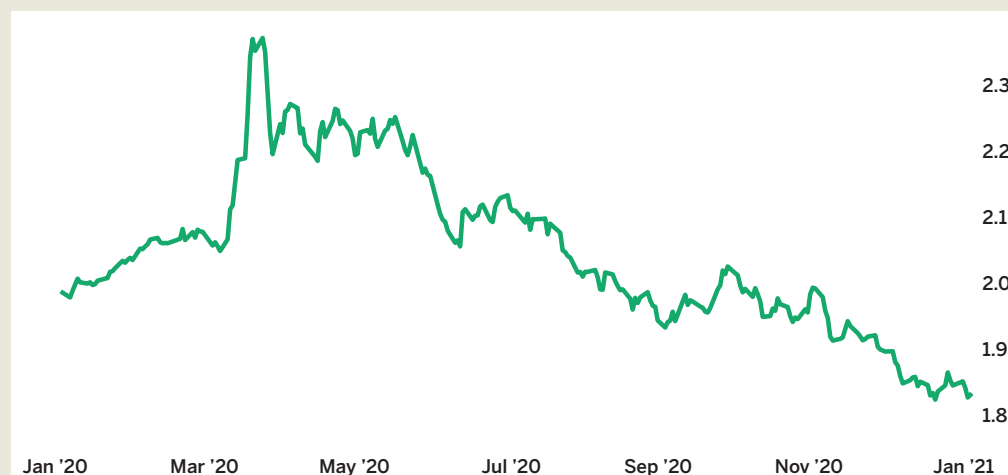
## American History 101

The average price for Small U.S. Dollar Futures (SFX) has varied over the last few years. SFX provides investors with access to a currency without the need to study cross relationships.



## Pairings

The SFX is at multi-year lows, and the Canadian dollar is at its weakest component. A long pair using SFX and MCD futures, FXC shares or 6C futures options could create a hedged USD long trade.





**THE TECHNICIAN** A VETERAN TRADER TACKLES TECHNICALS

# Seven Smart Stocks

By Tim Knight

**A**s *Luckbox* focuses on the measure of intelligence, let's turn our attention toward the sector of the equity markets dedicated to education companies.

Most well-known institutions of higher learning, such as Harvard, Stanford and MIT, are multi-billion-dollar entities but aren't publicly held. In recent years, however—particularly with the surge in online learning—dozens of corporations focused on education have been coming to the public markets.

These seven charts of the stock performance of publicly traded educational firms are loosely ranked, with the weakest and most vulnerable first, followed by the strongest and most promising.

## Strategic Education

Herndon, Virginia-based **Strategic Education** (STRA) owns a variety of for-profit educational firms, some with traditional campuses and others that concentrate on online learning. Besides operating Capella University and Strayer University, it has coding schools that include DevMountain, Generation Code, Hackbright Academy and The New York Code + Design Academy.

The company has been around nearly 30 years, starting in 1991 as Capella Education Co. From its IPO in 1996 until 2010, the stock did phenomenally well, rising from about \$5 to above \$220, an increase of more than 4,000%. In the next four years, however, the stock sank nearly 85%, partly because of the bad publicity that plagued for-profit education companies, especially ITT Technical Institute.

After surviving that era, the stock

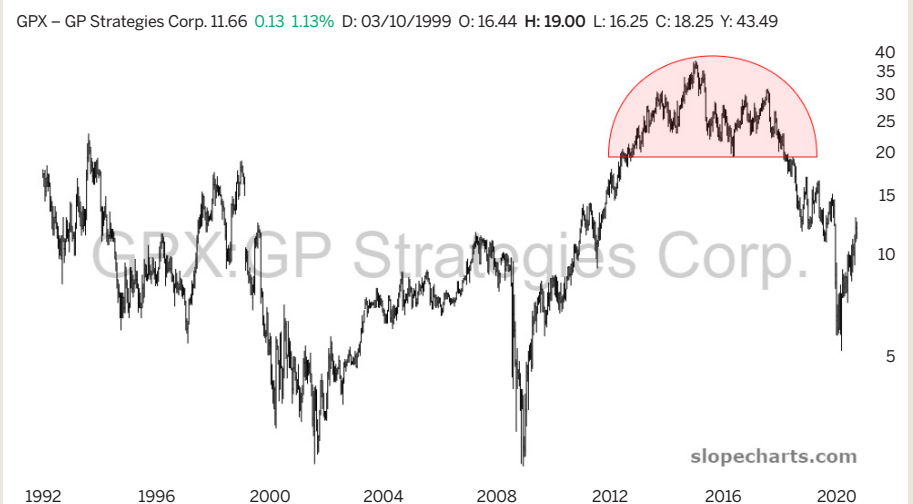
## Another downturn ahead?

After surviving a difficult period in for-profit education, Strategic Education appears vulnerable.



## Strong selling pressure

For more than half a decade, GP Strategies stock has exhibited a steady series of lower highs and lower lows—the very definition of a downtrend.



began climbing once more, although not to its former highs. It managed to rise as high as about \$175 before losing around half its value in the span of just months. Even after that substantial loss, the chart continues to look vulnerable because the topping pattern recently completed resembles a similar pattern from 2007-2011, which preceded a severe decline in share prices.

### GP Strategies

One of the oldest education companies on any public market, **GP Strategies** (GPX), began as a technology-focused venture capital firm in 1959 and had its public offering the very next year. Since then, GP Strategies has focused on products for sales and technical training. In recent years, it has emphasized e-learning and virtual reality.

The stock's performance over many years was unimpressive, and it bottomed out in March 2009 at a low of \$2.36. Then, however, its price and trading volume grew steadily, and its share price went up over 10-fold. A topping pattern was hammered out from about October 2012 to June 2018 in the shape of a large, inverted saucer. Once the pattern was completed, the stock once again tumbled down into the single digits, steadying itself at about \$5 per share.

Although the stock has recovered somewhat from those levels, the chart has been creating a steady series of lower highs and lower lows, demonstrating an unmistakable downtrend for more than half a decade. It seems likely that any buying will be overmatched by owners at higher prices liquidating their positions, creating strong selling pressure from all the overhead supply created over the years that the stock was trading in the \$20s and \$30s.

### Perdoceo

Until this year, Schaumburg, Illinois-based **Perdoceo** (PRDO) was known as Career Education Corp.

### The impending decline?

Perdoceo's topping pattern has been completed, possibly indicating a drop in stock price.



### Netflix for textbooks

Students can save money by renting books from Chegg. The founders say it's a business plan that enables the company to "profit and chill."



**Back in 2014, equity analysts tended to take a grim view of prospects for stocks in for-profit education companies.**



## China firm soars

Stock in China Online Education Group is near its lifetime highs, and its saucer pattern indicates a good chance of higher prices to come.

COE – China Online Education Group 29.77 -0.36 -1.18% D: 07/24/2017 O: 17.41 H: 18.28 L: 17.25 C: 18.09 Y: 41.11



**The markets seem to show the most enthusiasm for China-based companies, a trend that appears likely to continue in 2021.**

and used the ticker symbol CEC. The company, a for-profit postsecondary education provider, offers campus-based and online instruction from the associate level all the way up to doctoral levels, while also awarding certificates in career-focused disciplines.

Like other for-profit education companies, the company suffered quite a bit of bad publicity in the early 2010s, and its stock peaked at about \$66 in 2004 before falling to \$2 in 2013. In 2011, more than 95% of the company's revenue came from enrolling students whose tuition was paid by the federal government, with about \$67 million per year coming from the U.S. Department of Defense and the Veterans Administration.

That situation came to an end with the passage of a law known as the "90-10 Rule," which states for-profit colleges can get no more than 90% of their revenue from the government or face losing federal funding.

The company closed quite a few of its brick-and-mortar campuses, although it still retains some to this day. In the chart, two tinted areas

represent topping patterns. One of those areas, spanning 2008-2011, preceded an enormous drop in equity value. The present topping pattern, which was completed only recently, may presage a similar decrease in price. Suffice it to say that the stock chart looks vulnerable.

### Chegg Inc.

Instead of providing educational services directly to students, **Chegg Inc.** (CHGG) earns most of its revenue by renting out textbooks. The company was founded in 2000 by students at Iowa State University, and they coined the name by combining "chicken" and "egg." It was inspired by the fact that recent grads can't land a job without experience and can't get experience without a job.

Chegg operates like a **Netflix** (NFLX) for textbooks. College textbooks often cost hundreds of dollars, and a quarter's or semester's reading can push a book budget into quadruple digits. Chegg spreads the cost over many users, allowing clients to rent a book only for the period they require it. The company has acquired

about three million "subscribers," and revenue is approaching a third of a billion dollars a year.

Ever since early 2016, the company's stock has been doing remarkably well, climbing about 20-fold. Even in 2020, the stock tripled from March to August, and the uptrend has been impressive. The only concern is that the trendline was broken in August 2019, and what had been support has now become resistance. That doesn't mean the stock has to go down in price. On the contrary, it has climbed robustly. But note that the reliable trendline has changed its purpose, and the cleanness of the uptrend has ended.

### China Online Education Group

As one might suppose, **China Online Education Group** (COE) is based in China, and it provides English language education services online. It also provides tutoring through the internet, analyzes teacher aptitude, solicits ratings and feedback about teachers from students, and matches students with teachers based on learning objectives. In short, the company is focused on the development of English communication skills.

The company doesn't have as long a history as a publicly traded entity, but its recent saucer pattern is relatively well-formed and features good growth in trading volume. The stock is presently near its lifetime highs, and a clean break above this saucer would suggest higher prices ahead.

### TAL Education Group

The acronym for **TAL Education Group** (TAL) stands for Tomorrow Advancing Life, another Chinese firm focused on online education by way of high tech. Its performance as a stock has been superb.

During the past eight years, the stock has increased an incredible 8,000%. What's even more remarkable is the steady, unrelenting pace of the climb. Similar to stocks like Walmart and The Home Depot, TAL

has simply pushed higher month after month, year after year, with no meaningful downturn.

The strongest general bear markets don't break the uptrend but can cause a temporary softness to the stock's price. The company's strategy, revenues and profits are lined up well.

### New Oriental Education

Another Chinese company, **New Oriental Education (EDU)**, resides at the "top of the heap." It's the largest educational company in China, based on enrollment, number of programs and broad geographic presence. Unlike other companies that focus strictly on higher education, New Oriental works with children beginning in pre-school. The company became public in 2006 as the first Chinese educational IPO, and it now has 30 million students.

The main company prepares clients for standardized tests, such as the TOEFL, SAT, ACT, GRE, GMAT, IELTS and LSAT. It will be interesting to see in the years ahead if revenue from test preparation starts to soften, given the reduced "push" of Chinese nationals to attend United States colleges and universities.

Although New Oriental's stock price is not as calm and steady as TAL stock, the overall trend is obviously up, and the sharpness of the uptrend keeps increasing. There are three trendlines on this chart, each more recent than the other, and each more sharply ascending than the prior one. Normally, stocks tend to diminish in energy, but the company seems to be accelerating its ascent.

### Commencement

Back in 2014, equity analysts tended to view prospects for stocks in for-profit education companies as grim. But the apex of public rancor against the sector was actually the nadir of those stock prices. One general conclusion to draw from the seven stocks examined here is that the public markets seem to show the most enthusiasm for China-based

### Unrelenting climb

During the past eight years, stock in China-based TAL, an online tech learning firm, has increased an incredible 8,000%.

TAL – TAL Education Group 70.31 0.30 0.43% D: 03/14/2013 O: 1.44 H: 1.44 L: 1.29 C: 1.30 Y: 98.38



### Standardized growth accelerating ascent

Stocks tend to diminish in energy, but the upward motion at New Oriental Education seems to be gaining speed.

EDU–New Oriental Education & Technolog 162.08 4.12 2.61% D: 04/08/2010 O: 20.35 H: 21.17 L: 20.29 C: 20.60 Y: 219.02



companies. The trend appears likely to continue in 2021. 📈

**Tim Knight** has been using technical analysis to trade the markets for 30 years. He hosts *Trading the Close* daily on the tastytrade network and offers free access to his charting platform at [slopecharts.com](https://slopecharts.com).



DO DILIGENCE QUIET FOUNDATION HELPS PROACTIVE INVESTORS UNDERSTAND THEIR PORTFOLIOS

# High-IQ ETFs

By James Blakeway

**T**he American public has favored mutual funds for decades and by the end of 2019 had placed \$21.3 trillion in them, often through 401(k) retirement plans. Luckily for investors, the growth in the mutual fund industry led to more competition, prompting fund managers to refine strategy and lower fees to stay competitive.

But more recently, ETFs saw increasing numbers and became more popular among investors and traders who want to step outside of their 401(k) plans. ETFs tend to ditch the fund manager and simply track an underlying index. For example, the **SPDR S&P 500 ETF (SPY)** tracks the S&P 500 index.

That means lower overall fund expenses as firms don't pay for managers and analysts. Last year, investment in ETFs worldwide totaled \$6.3 trillion with 70% of those assets trading in the United States. The growth of ETFs also

forced financial firms to add diversity and invent new products to entice investors, including the advent of smart beta ETFs.

Smart beta ETFs trade on exchanges like any other ETF, but the difference lies in the portfolio construction. These funds act as a hybrid of an index- or sector-tracking ETF and a traditionally managed mutual fund. That's typically achieved by sticking with an underlying index and then applying a rule or set of rules governing which stocks should be purchased for the ETF.

Those rules, or factors, vary across smart beta ETFs and are imposed to add traditional investment principals to the fund construction. While there's a plethora of smart beta ETFs out there, let's focus on a sample of those provided by iShares, one of the nation's top ETF companies. (See "Three smart beta approaches," below).

## Get smart

The seven funds in the table total near \$85 billion in assets and illustrate a variety of factor strategies by iShares, a subsidiary of BlackRock. Three types of smart beta ETFs are represented here: single-factor (using only one parameter to select stocks), multi-factor (using multiple factors to select stocks) and minimum-volatility (selecting stocks that exhibit lower volatility).

The single-factor ETFs focused on companies that seemed undervalued (VLUE), companies with quality financial health (QUAL) and companies that were showing upward momentum (MTUM). Both the value and quality funds underperformed the S&P 500 ETF, which is typically considered the benchmark of the U.S. stock market.

The momentum fund did manage to outperform the S&P 500 in both average annual and total returns the past five years. However, this perfor-

Think of a smart beta exchange-traded fund as a hybrid of an index- or sector-tracking ETF and a traditionally managed mutual fund.

## Three smart beta approaches

These seven funds represent three iShares factor strategies for smart beta ETFs: single-factor (using only one parameter to select stocks), multi-factor (using multiple factors) and minimum-volatility (selecting stocks with lower volatility).

Data as of Dec. 1, 2020; Historical data from January 2016 – November 2020

Name	U.S. Value Factor	U.S. Quality Factor	U.S. Momentum Factor	U.S. Multifactor	Global Multifactor	U.S. Min Vol Factor	Emerging Markets Min Vol Factor
<b>Ticker</b>	VLUE	QUAL	MTUM	LRGF	INTF	USMV	EEMV
<b>Price</b>	\$84.46	\$112.06	\$155.93	\$36.07	\$25.77	\$66.35	\$58.18
<b>Average Annual Return</b>	9.90%	14.40%	18.70%	11.30%	5.60%	12.40%	6.90%
<b>Total Return</b>	53.10%	89.30%	126.80%	65.20%	24.00%	75.70%	36.00%
<b>Average Historical Volatility</b>	16.90%	14.30%	16.30%	15.00%	14.90%	11.90%	13.60%
<b>Expense Ratio</b>	0.15%	0.15%	0.15%	0.20%	0.30%	0.15%	0.25%
<b>Liquid Options</b>	No	No	No	No	No	No	No

mance paled compared with the Nasdaq-100 ETF, typically considered the choice for more aggressive index investing. The momentum fund failed to keep pace with the Nasdaq in each positive return year and lost 1.67% in 2018, compared with a loss of 0.13% for the Nasdaq.

Consider next the multifactor smart beta ETFs. Both the MSCI USA multifactor (LRGF) and MSCI international multifactor (INTF) ETFs focus on portfolios of stocks that show potential relating to quality, value, size and momentum. The USA multifactor ETF can once again be compared with the major U.S. stock indexes, the S&P 500 and the Dow Jones Industrial Average (DIA).

The multifactor ETF lagged behind the stock indexes. What stands out is that the returns were not lower with lower volatility. The multifactor ETF exhibited a slightly higher volatility than either the S&P 500 or Dow Jones ETF, and it did so with a higher expense ratio. That means investors who held the multifactor U.S. ETF saw larger fluctuations in their portfolio and paid higher fees to do so—while seeing lower returns.

The international multifactor ETF presents a similar story when compared with the iShares MSCI International ETF (EFA). Both ETFs focus on global stocks in developed nations. While the smart beta ETF has marginally lower fees, two basis points, the performance once again lagged behind the standard ETF. While the 36.6% total return for the international ETF is far below the U.S. indexes, it still beat the smart beta fund by over 12%.

The minimum volatility funds appear to be where iShares smart beta tactics shine brightest. As the

### For comparison ...

Studying the history of ETFs on the major exchanges helps investors understand how the performance of smart beta ETFs compares with regular ETFs.

*Data as of Dec. 1, 2020; Historical data from January 2016 – November 2020*

Name	S&P 500	Dow Jones Industrial Average	Nasdaq-100	Global Developed Index	Emerging Markets
<b>Ticker</b>	SPY	DIA	QQQ	EFA	EEM
<b>Price</b>	\$362.06	\$296.62	\$299.62	\$69.48	\$48.23
<b>Average Annual Return</b>	14.90%	14.40%	24.00%	7.40%	12.10%
<b>Total Return</b>	94.80%	90.30%	179.00%	36.60%	66.40%
<b>Average Historical Volatility</b>	14.40%	14.90%	18.30%	14.70%	19.40%
<b>Expense Ratio</b>	0.10%	0.16%	0.20%	0.32%	0.68%
<b>Liquid Options</b>	Yes	Yes	Yes	Yes	Yes

name suggests, the goal is simply to stick with the chosen index but lower the overall volatility by emphasizing stocks that are less volatile. Both the U.S. minimum volatility (USMV) and emerging markets minimum volatility (EEMV) funds succeeded in providing a lower average volatility compared with their index counterparts.

However, the caveat is a substantially lower return over the past five years. Surprisingly, the emerging markets minimum volatility fund offered an expense ratio at 43 basis points below the standard emerging markets ETF (EEM). Though, again, that wasn't worth the 30% difference in returns. There's definitely some merit to the minimum volatility funds, especially for older, more risk-averse investors, because they maintained lower volatility compared with the standard index funds.

### Smart choice

Most investors who debate whether to invest in smart beta funds will

likely do so in an IRA or personal margin account with far more flexibility and choices than the average 401(k) plan. That flexibility includes the opportunity to sell options, or option spreads against ETFs, and potentially lower risk while enhancing returns.

Unfortunately, that's not the case with the smart beta ETFs. There are no liquid options markets in any of these analyzed funds, adding to the list of reasons investors may wish to stick with index and sector ETFs. Those index and sector ETFs may not be "smart" ETFs, but they certainly aren't dumb investment choices. Regardless of investing goals and risk tolerance, there's likely an ETF for every investor. Be smarter than the average investor, find what works for you and, as always, do your due diligence. 📦

**James Blakeway** serves as CEO of Quiet Foundation, a data science-driven subsidiary of tastytrade that provides fee-free investment analysis services for self-directed investors. @jamesblakeway

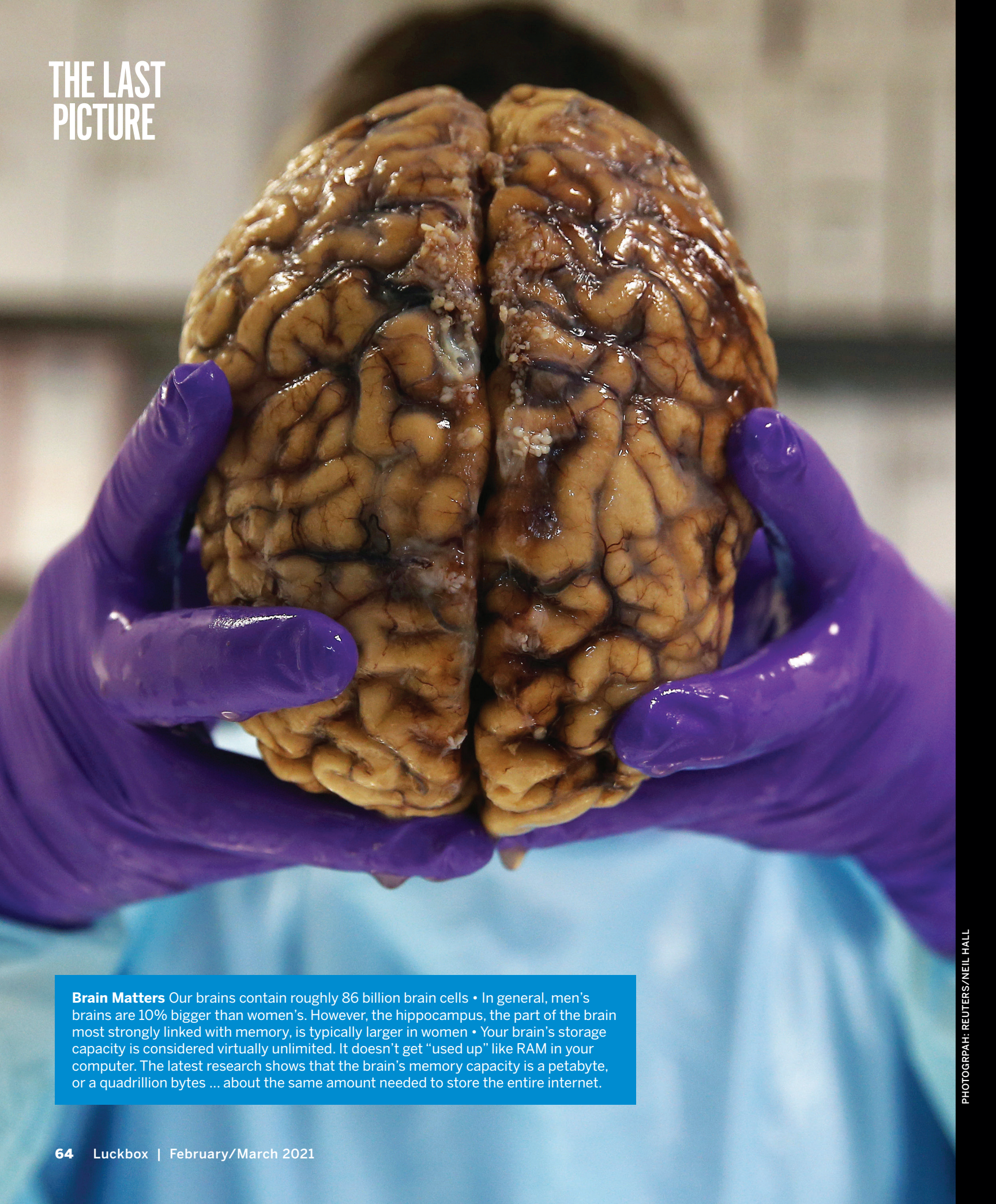


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Issue The High Anxiety Economy

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- Best New Custom Content  
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- Best Full Issue 2020 Custom Content
- Best New Magazine  
Honorable Mention

### Folio Ozzie Awards

- Best Design in Custom Content  
Honorable Mention
- Best Design in a New Magazine  
Honorable Mention

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- Best New Magazine Design  
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