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FIND THE TRUTH AND PRINT IT

When I was a child in Ann Arbor, Michigan, my parents used to load my sister and me into the car and drive to my grandparents' house near Detroit.

My grandparents were immigrants from Russia and Poland. They spoke broken, heavily accented English with a lot of Yiddish sprinkled in.

My grandfather was a pugnacious, up-by-his-bootstraps businessman who didn't get past fifth grade. But what he lacked in education he made up for in certainty. He won every argument, big or small, by trotting out what he called the "Actual Facts," usually at top volume.

After each visit, on the drive home, my sister and I would snicker about my grandfather's Actual Facts—a ridiculous, redundant phrase. *We* knew that facts were facts. Period.

In a newsroom where I worked 35 years ago, our motto was similarly unambiguous: Find the truth and print it. That was correct then, and it is now. So it astounds me today that, in the United States and elsewhere, we're talking about Actual Facts—to say nothing of "alternative facts," "fake news," and "post-truth." Clearly, it's the ideal time to publish this month's cover, a scientific exploration of why we lie.

When my grandfather distorted the truth, it was annoying, but it didn't really matter—the stakes were low. But now, when elected leaders around the world do the same thing, it's frightening.

What's even scarier, in this digital era, is how errors of fact proliferate instantly, and that so many people embrace the alternate realities. The trust gap between the public and experts, after widening for decades, is now a chasm. And as "certified" experts decline in stature, "self-declared" experts ascend.

This is the bad news. But there's also good news—and you are a big part of it.

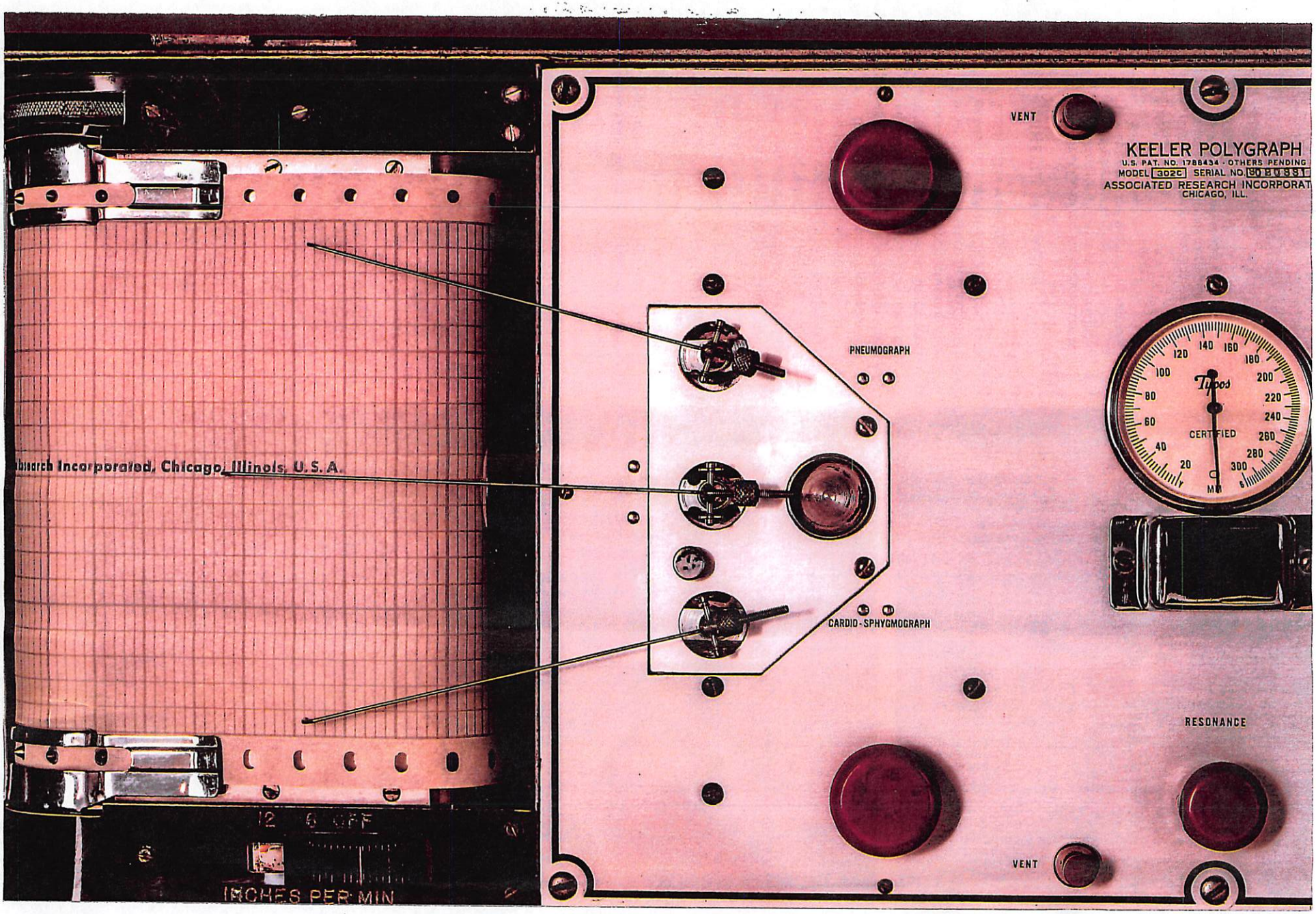
One of the great joys of working here is witnessing the affection and deep trust that readers feel for National Geographic and the content that we publish across platforms. I believe we keep that trust by producing journalism that is honest and fair, grounded in science and evidence, designed to educate and inform.

Confidence in the integrity of our work enables us to defend it, civilly, to those with other beliefs. That seems like a good place to start if we're ever going to agree, let alone act, on *actual* facts.

Susan Goldberg, *Editor in Chief*

In a University of Toronto study, children were put in situations where they had to choose between lying and telling the truth while researchers observed their brain activity using neuroimaging headgear.

PHOTO: DAN WINTERS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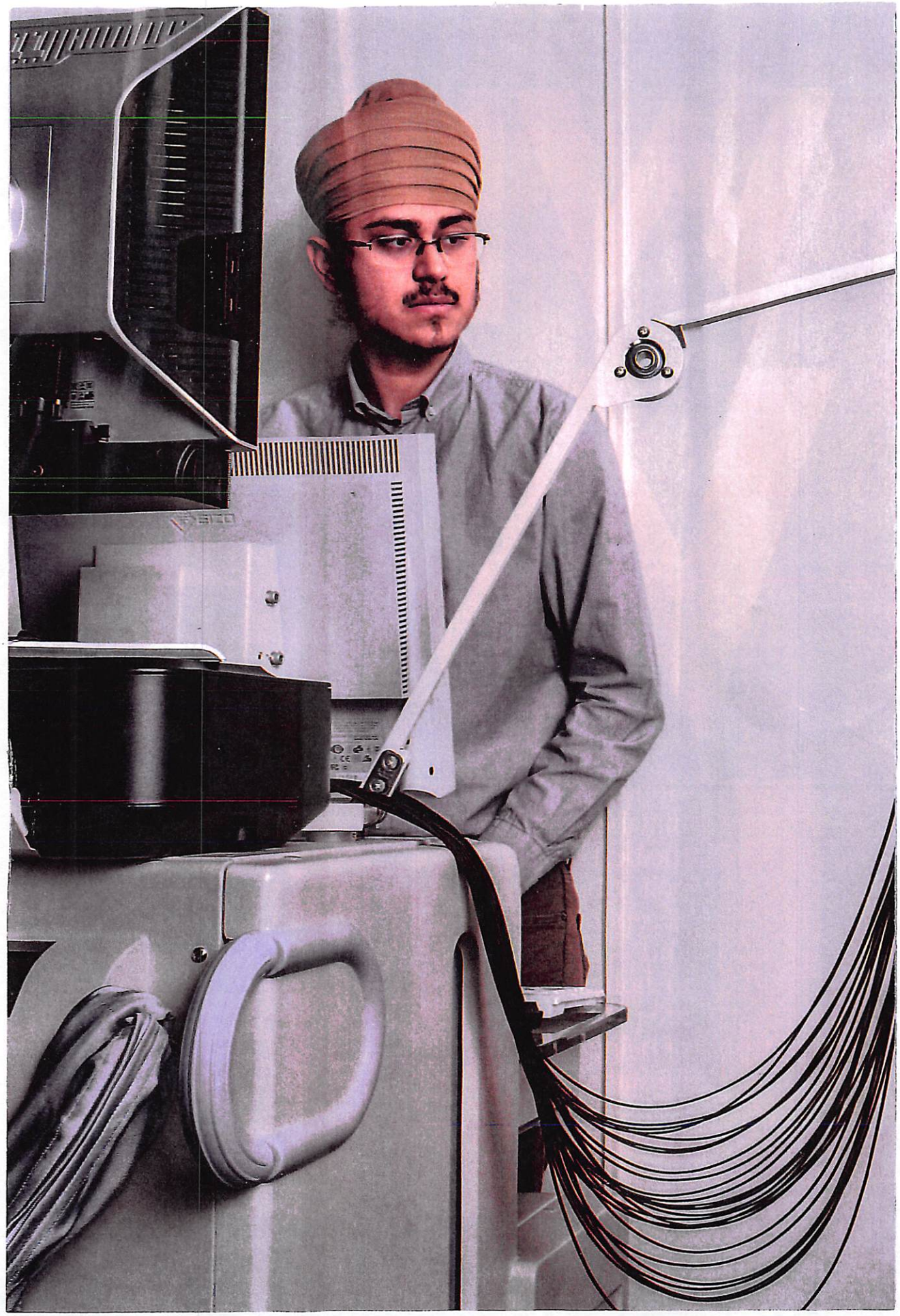
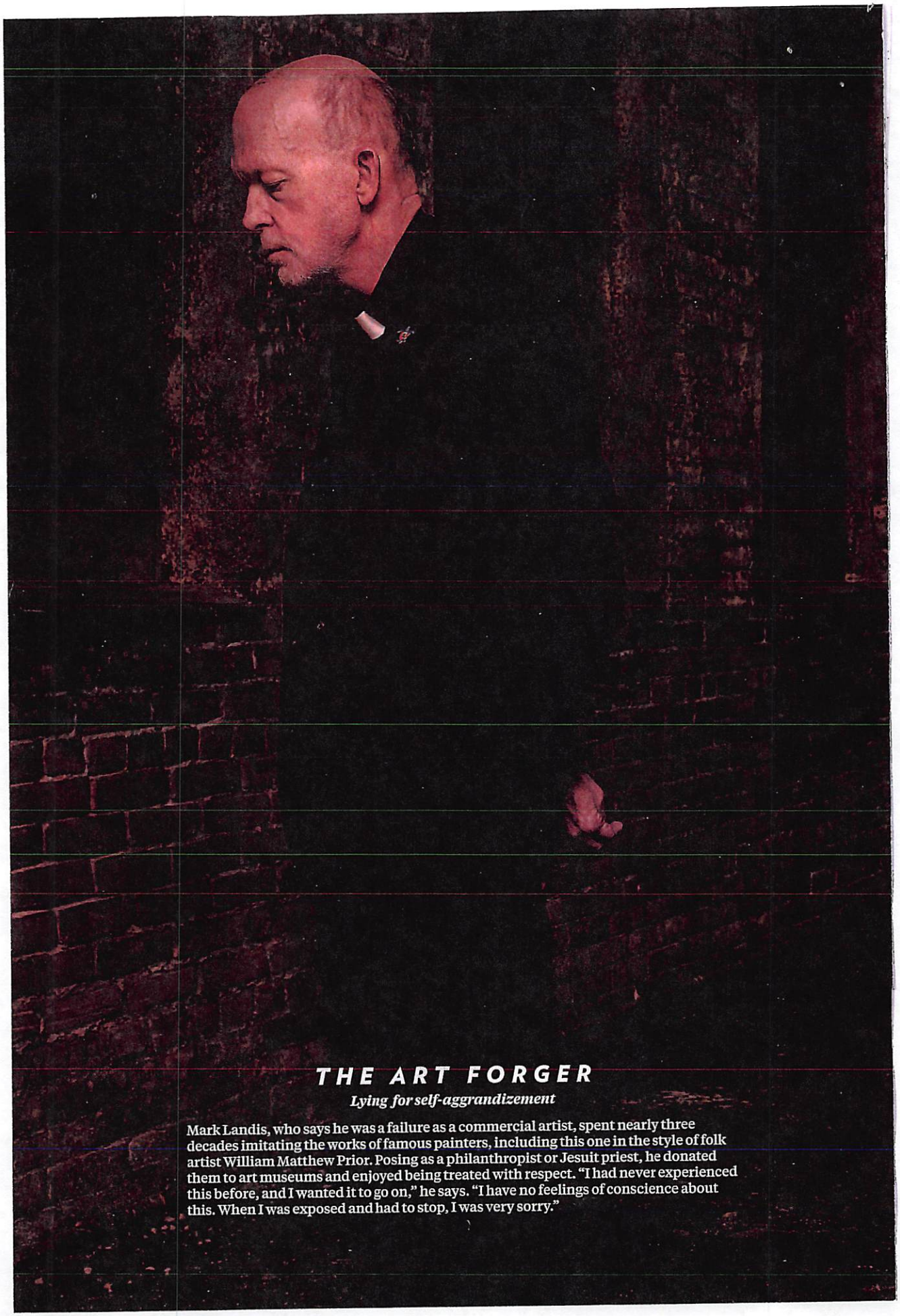


Learning to lie is a natural stage in child development. Kang Lee, a psychologist at the University of Toronto, has explored how children become more sophisticated liars as they age. Darshan Panesar, a research assistant, and nine-year-old Amelia Tong demonstrate functional near-infrared spectroscopy technology, which Lee uses in his studies.



THE ART FORGER

Lying for self-aggrandizement

Mark Landis, who says he was a failure as a commercial artist, spent nearly three decades imitating the works of famous painters, including this one in the style of folk artist William Matthew Prior. Posing as a philanthropist or Jesuit priest, he donated them to art museums and enjoyed being treated with respect. "I had never experienced this before, and I wanted it to go on," he says. "I have no feelings of conscience about this. When I was exposed and had to stop, I was very sorry."

BY **YUDHIJIT BHATTACHARJEE** // PHOTOGRAPHS BY **DAN WINTERS**

IN THE FALL OF 1989 PRINCETON UNIVERSITY WELCOMED INTO ITS FRESHMAN CLASS A YOUNG MAN NAMED ALEXI SANTANA, WHOSE LIFE STORY THE ADMISSIONS COMMITTEE HAD FOUND EXTRAORDINARILY COMPELLING.

He had barely received any formal schooling. He had spent his adolescence almost entirely on his own, living outdoors in Utah, where he'd herded cattle, raised sheep, and read philosophy. Running in the Mojave Desert, he had trained himself to be a distance runner.

Santana quickly became something of a star on campus. Academically too he did well, earning A's in nearly every course. His reserved manner and unusual background suffused him with an enigmatic appeal. When a suite mate asked Santana how his bed always seemed to be perfectly made, he answered that he slept on the floor. It seemed perfectly logical that someone who had spent much of his life sleeping outdoors would have no fondness for a bed.

Except that Santana's story was a lie. About 18 months after he enrolled, a woman recognized him as somebody she'd known as Jay Huntsman at Palo Alto High School in California six years earlier. But even that wasn't his real name. Princeton officials eventually learned that he was actually James Hogue, a 31-year-old who had served a prison sentence in Utah for possession of stolen tools and bike parts. He was taken away from Princeton in handcuffs.

In the years since, Hogue has been arrested several times on theft charges. In November, when he was arrested for stealing in Aspen, Colorado, he tried to pass himself off as someone else.

THE HISTORY OF HUMANKIND is strewn with crafty and seasoned liars like Hogue. Many are criminals who spin lies and weave deceptions to gain unjust rewards—as the financier Bernie Madoff did for years, duping investors out of billions of dollars until his Ponzi scheme collapsed. Some are politicians who lie to come to power or cling to it, as Richard Nixon famously did when he denied any role in the Watergate scandal.

Sometimes people lie to inflate their image—a motivation that might best explain President Donald Trump's demonstrably false assertion that his Inauguration crowd was bigger than President Barack Obama's first one. People lie to cover up bad behavior, as American swimmer Ryan Lochte did during the 2016 Summer Olympics by claiming to have been robbed at gunpoint at a gas station when, in fact, he and his teammates, drunk after a party, had been confronted by armed security guards after damaging property. Even academic science—a world largely inhabited by people devoted to the pursuit of truth—has been shown to contain a rogue's gallery of deceivers, such as physicist Jan Hendrik Schön, whose purported breakthroughs in molecular semiconductor research proved to be fraudulent.

These liars earned notoriety because of how egregious, brazen, or damaging their falsehoods were. But their deceit doesn't make them as much of an aberration as we might think. The

THE CHAMP

Lying for fun

Jacob Hall's desire to become a superhero inspired a tall tale that won him the West Virginia's Biggest Liar award and a golden shovel at last year's Vandalia Gathering, a folk festival in Charleston. "My stories would be pretty boring without deception," says Hall, who intends to spin yarns "for the rest of my life, if you can believe that."

lies that impostors, swindlers, and boasting politicians tell merely sit at the apex of a pyramid of untruths that have characterized human behavior for eons.

Lying, it turns out, is something that most of us are very adept at. We lie with ease, in ways big and small, to strangers, co-workers, friends, and loved ones. Our capacity for dishonesty is as fundamental to us as our need to trust others, which ironically makes us terrible at detecting lies. Being deceitful is woven into our very fabric, so much so that it would be truthful to say that to lie is human.

The ubiquity of lying was first documented systematically by Bella DePaulo, a social psychologist at the University of California, Santa Barbara. Two decades ago DePaulo and her colleagues asked 147 adults to jot down for a week every instance they tried to mislead someone. The researchers found that the subjects lied on average one or two times a day. Most of these untruths were innocuous, intended to hide one's inadequacies or to protect the feelings of others. Some lies were excuses—one subject blamed the failure to take out the garbage on not knowing where it needed to go. Yet other lies—such as a claim of being a diplomat's son—were aimed at presenting a false image. While these were minor transgressions, a later study by DePaulo and other colleagues involving a similar sample indicated that most people have, at some point, told one or more "serious lies"—hiding an affair from a spouse, for example, or making false claims on a college application.

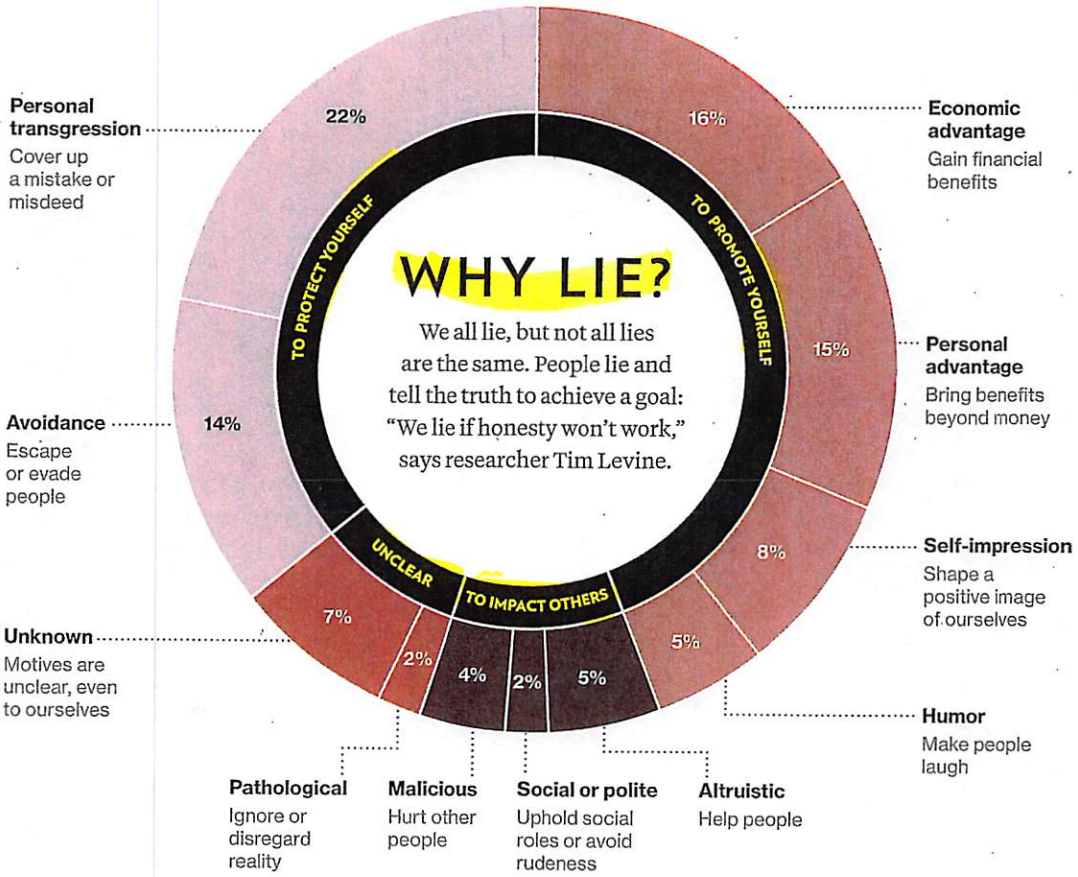
That human beings should universally possess a talent for deceiving one another shouldn't surprise us. Researchers speculate that lying as a behavior arose not long after the emergence of language. The ability to manipulate others without using physical force likely conferred an advantage in the competition for resources and mates, akin to the evolution of deceptive strategies in the animal kingdom, such as camouflage. "Lying is so easy compared to other ways of gaining power," notes Sissela Bok, an ethicist at Harvard University who's one of the most prominent thinkers on the subject. "It's much easier to lie in order to get somebody's money or wealth than to hit them over the head or rob a bank."

As lying has come to be recognized as a deeply ingrained human trait, social science researchers and neuroscientists have sought to illuminate the nature and roots of the behavior. How and when do we learn to lie? What are the psychological and neurobiological underpinnings of dishonesty? Where do most of us draw the line? Researchers are learning that we're prone to believe some lies even when they're unambiguously contradicted by clear evidence. These insights suggest that our proclivity for deceiving others, and our vulnerability to being deceived, are especially consequential in the age of social media. Our ability as a society to separate truth from lies is under unprecedented threat.

WHEN I WAS IN THIRD GRADE, one of my classmates brought a sheet of racing car stickers to school to show off. The stickers were dazzling. I wanted them so badly that I stayed back during gym class and transferred the sheet out of the classmate's backpack into mine. When the students returned, my heart was racing. Panicking that I would be found out, I thought up a preemptive lie. I told the teacher that two teenagers had shown up on a motorbike, entered the classroom, rifled through backpacks, and left with the stickers. As you might expect, this fib collapsed at the gentlest probing, and I reluctantly returned what I had pilfered.

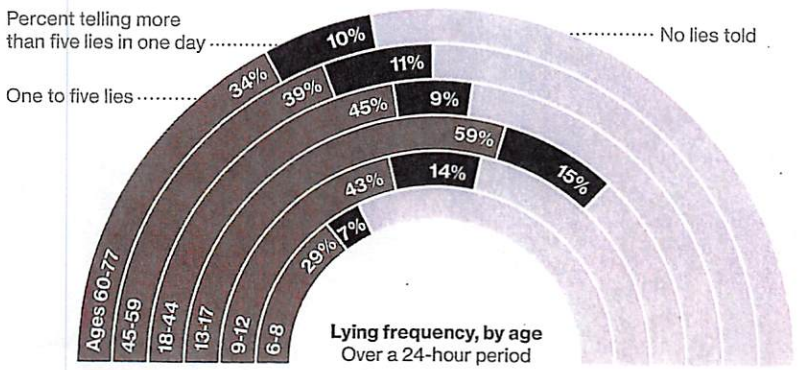
My naive lying—I got better, trust me—was matched by my gullibility in sixth grade, when a friend told me that his family owned a flying capsule that could transport us anywhere in the world. Preparing to travel on this craft, I asked my parents if they could pack me a few meals for the journey. Even when my older brother snickered, I refused to disbelieve my friend's claim, and it was left to my friend's father to finally convince me that I'd been duped.

These lies that my friend and I told were nothing out of the ordinary for kids our age. Like learning to walk and talk, lying is something of a developmental milestone. While parents often find their children's lies troubling—for they signal



BENDING THE TRUTH

"The truth comes naturally," says psychologist Bruno Verschuere, "but lying takes effort and a sharp, flexible mind." Lying is a part of the developmental process, like walking and talking. Children learn to lie between ages two and five, and lie the most when they are testing their independence.



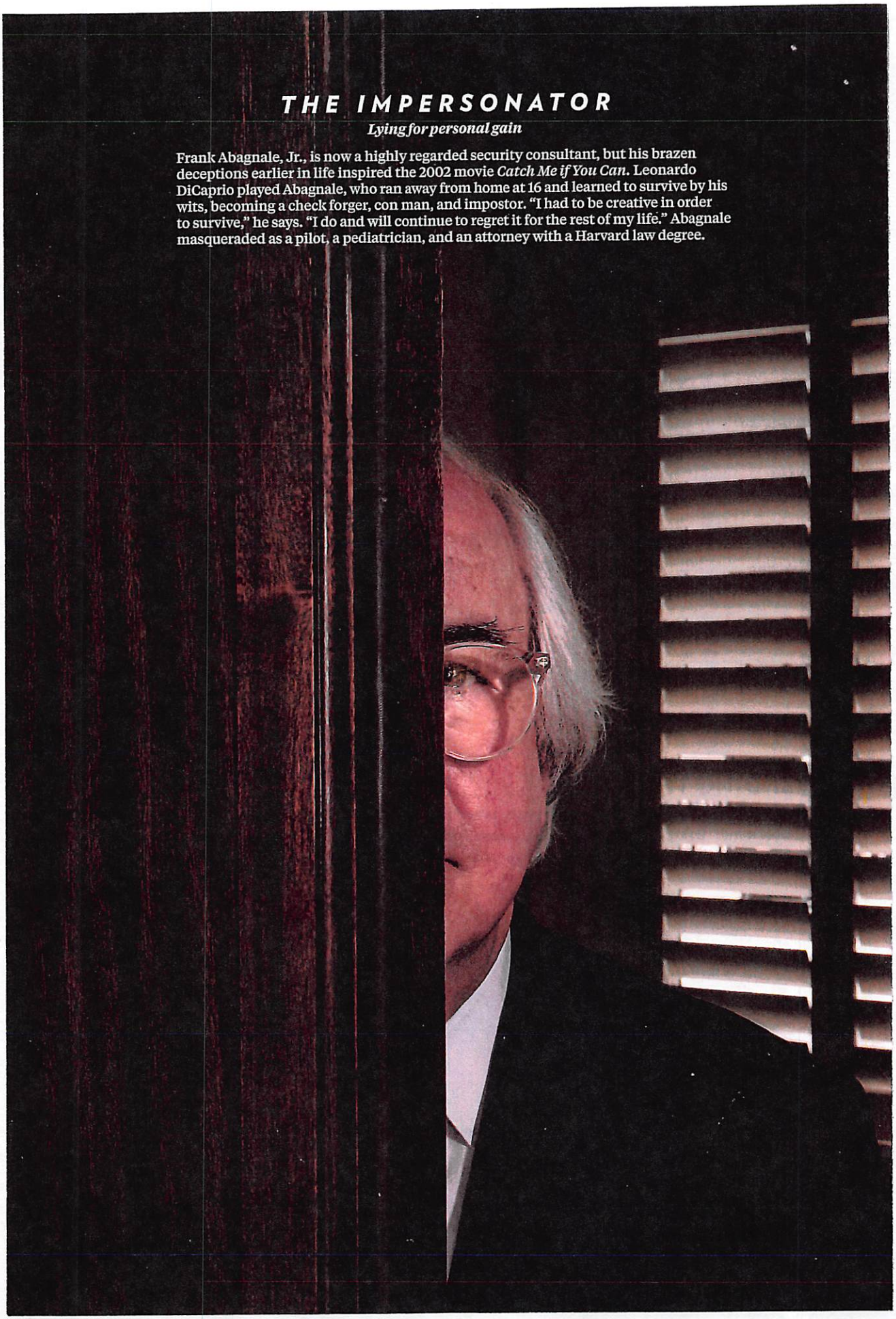
RYAN MORRIS, NGM STAFF; SHELLEY SPERRY

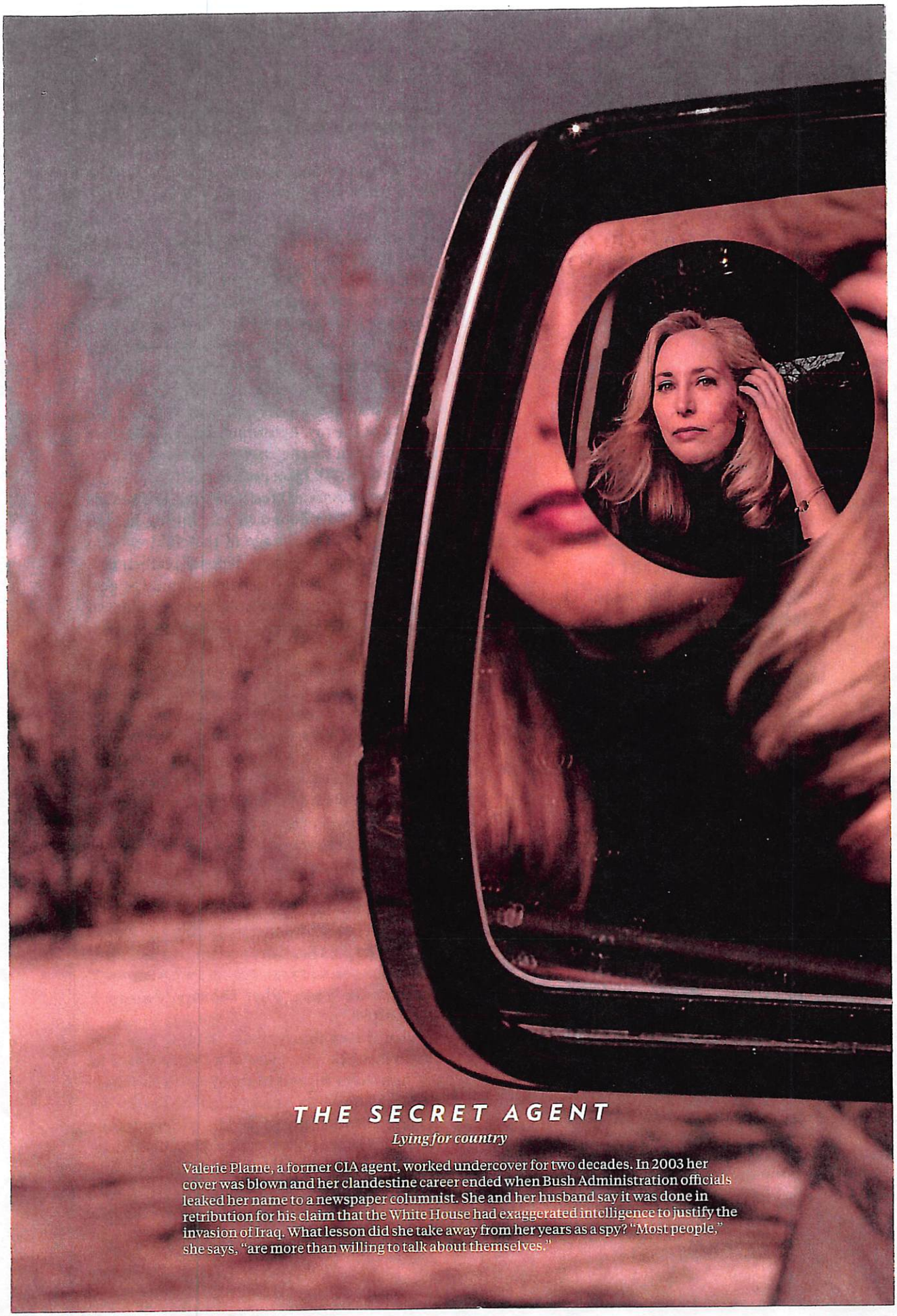
SOURCES: TIMOTHY R. LEVINE AND OTHERS, *JOURNAL OF INTERCULTURAL COMMUNICATION RESEARCH*, 2016; EVELYNE DEBEY AND OTHERS, *ACTA PSYCHOLOGICA*, 2015; KIM SEROTA, OAKLAND UNIVERSITY

THE IMPERSONATOR

Lying for personal gain

Frank Abagnale, Jr., is now a highly regarded security consultant, but his brazen deceptions earlier in life inspired the 2002 movie *Catch Me if You Can*. Leonardo DiCaprio played Abagnale, who ran away from home at 16 and learned to survive by his wits, becoming a check forger, con man, and impostor. "I had to be creative in order to survive," he says. "I do and will continue to regret it for the rest of my life." Abagnale masqueraded as a pilot, a pediatrician, and an attorney with a Harvard law degree.





THE SECRET AGENT

Lying for country

Valerie Plame, a former CIA agent, worked undercover for two decades. In 2003 her cover was blown and her clandestine career ended when Bush Administration officials leaked her name to a newspaper columnist. She and her husband say it was done in retribution for his claim that the White House had exaggerated intelligence to justify the invasion of Iraq. What lesson did she take away from her years as a spy? "Most people," she says, "are more than willing to talk about themselves."

PRESIDENTIAL UNTRUTHS

Watergate set the bar for presidential lies when Nixon insisted he played no role.

ON THE MORNING of June 17, 1972, five men were arrested after breaking into the Democratic National Committee headquarters in the Watergate building in Washington, D.C. The media, led by *Washington Post* reporters Bob Woodward and Carl Bernstein, doggedly pursued the story, exposing wiretaps, secret documents, and hush money. President Richard Nixon denied involvement in the scandal, declaring, "I am not a crook," in a nationally televised press conference. But the White House cover-up failed. Faced with almost certain impeachment, Nixon resigned from his second term in office on August 9, 1974.

OTHER FAMOUS FIBS

DONALD TRUMP: *"I won the popular vote if you deduct the millions of people who voted illegally."*

The president—who won the Electoral College but lost the popular vote—has kept fact-checkers busy with his steady tweets, many provably untrue. There's no evidence of significant voter fraud.

BILL CLINTON: *"I did not have sexual relations with that woman."*

Clinton's initial denial in early 1998 was subsequently proved false by the discovery of his DNA in a stain on intern Monica Lewinsky's dress.

ART BY TIM MCDONAGH; TEXT BY CLAUDIA KALB

the beginning of a loss of innocence—Kang Lee, a psychologist at the University of Toronto, sees the emergence of the behavior in toddlers as a reassuring sign that their cognitive growth is on track.

To study lying in children, Lee and his colleagues use a simple experiment. They ask kids to guess the identity of toys hidden from their view, based on an audio clue. For the first few toys, the clue is obvious—a bark for a dog, a meow for a cat—and the children answer easily. Then the sound played has nothing to do with the toy. "So you play Beethoven, but the toy's a car," Lee explains. The experimenter leaves the room on the pretext of taking a phone call—a lie for the sake of science—and asks the child not to peek at the toy. Returning, the experimenter asks the child for the answer, following up with the question: "Did you peek or not?"

Most children can't resist peeking, Lee and his researchers have found by monitoring hidden cameras. The percentage of the children who peek and then lie about it depends on their age. Among two-year-old transgressors, only 30 percent are untruthful. Among three-year-olds, 50 percent lie. And by eight, about 80 percent claim they didn't peek.

Kids also get better at lying as they get older. In guessing the toy that they secretly looked at, three- and four-year-olds typically blurt out the right answer, without realizing that this reveals their transgression and lying. At seven or eight, kids learn to mask their lying by deliberately giving a wrong answer or trying to make their answer seem like a reasoned guess.

Five- and six-year-old kids fall in between. In one study Lee used Barney the dinosaur as the toy. A five-year-old girl who denied having looked at the toy, which was hidden under a cloth, told Lee she wanted to feel it before guessing. "So she puts her hand underneath the cloth, closes her eyes, and says, 'Ah, I know it's Barney,'" Lee recounts. "I ask, 'Why?' She says, 'Because it feels purple.'"

What drives this increase in lying sophistication is the development of a child's ability to put himself or herself in someone else's shoes. Known as theory of mind, this is the facility we acquire for understanding the beliefs, intentions, and knowledge of others. Also fundamental to lying is the brain's executive function: the abilities required for planning, attention, and self-control. The two-year-olds who lied in Lee's

experiments performed better on tests of theory of mind and executive function than those who didn't. Even at 16, kids who were proficient liars outperformed poor liars. On the other hand, kids on the autism spectrum—known to be delayed in developing a robust theory of mind—are not very good at lying.

ON A RECENT MORNING, I took an Uber to visit Dan Ariely, a psychologist at Duke University and one of the world's foremost experts on lying. The inside of the car, though neat, had a strong odor of sweaty socks, and the driver, though courteous, had trouble finding her way. When we finally got there, she asked me smilingly if I would give her a five-star rating. "Sure," I replied. Later, I gave her three stars. I assuaged my guilt by telling myself that it was better not to mislead thousands of Uber riders.

Ariely became fascinated with dishonesty about 15 years ago. Looking through a magazine on a long-distance flight, he came across a mental aptitude test. He answered the first question and flipped to the key in the back to see if he got it right. He found himself taking a quick glance at the answer to the next question. Continuing in this vein through the entire test, Ariely, not surprisingly, scored very well. "When I finished, I thought—I cheated myself," he says. "Presumably, I wanted to know how smart I am, but I also wanted to prove I'm this smart to myself." The experience led Ariely to develop a lifelong interest in the study of lying and other forms of dishonesty.

In experiments he and his colleagues have run on college campuses and elsewhere, volunteers are given a test with 20 simple math problems. They must solve as many as they can in five minutes and are paid based on how many they get right. They are told to drop the sheet into a shredder before reporting the number they solved correctly. But the sheets don't actually get shredded. A lot of volunteers lie, as it turns out. On average, volunteers report having solved six matrices, when it was really more like four. The results are similar across different cultures. Most of us lie, but only a little.

The question Ariely finds interesting is not why so many lie, but rather why they don't lie a lot more. Even when the amount of money offered for correct answers is raised significantly, the volunteers don't increase their level of

SCANDALS IN SPORTS

The White Sox shocked the nation when they threw the World Series.

NEARLY A CENTURY AGO, some members of the Chicago White Sox baseball team accepted a bribe—as much as $100,000 (about $1.4 million today)—to deliberately lose the 1919 World Series to the Cincinnati Reds. Suspicions arose in the first game after uncharacteristically sloppy pitching by the White Sox, who were heavily favored to win. "I don't know why I did it," pitcher Eddie Cicotte testified before a grand jury. "I must have been crazy." He and seven other players, including "Shoeless" Joe Jackson, were indicted on nine counts of conspiracy but acquitted by a jury. They were banned from the game for life.

OTHER FAMOUS FIBS

LANCE ARMSTRONG: *"I've said it for longer than seven years. I have never doped."*

As he had many times, the seven-time Tour de France winner lied to CNN's Larry King in 2005. Stripped of his titles, in 2013 he admitted to having cheated.

ROSIE RUIZ: *"I ran the race. I really did."*

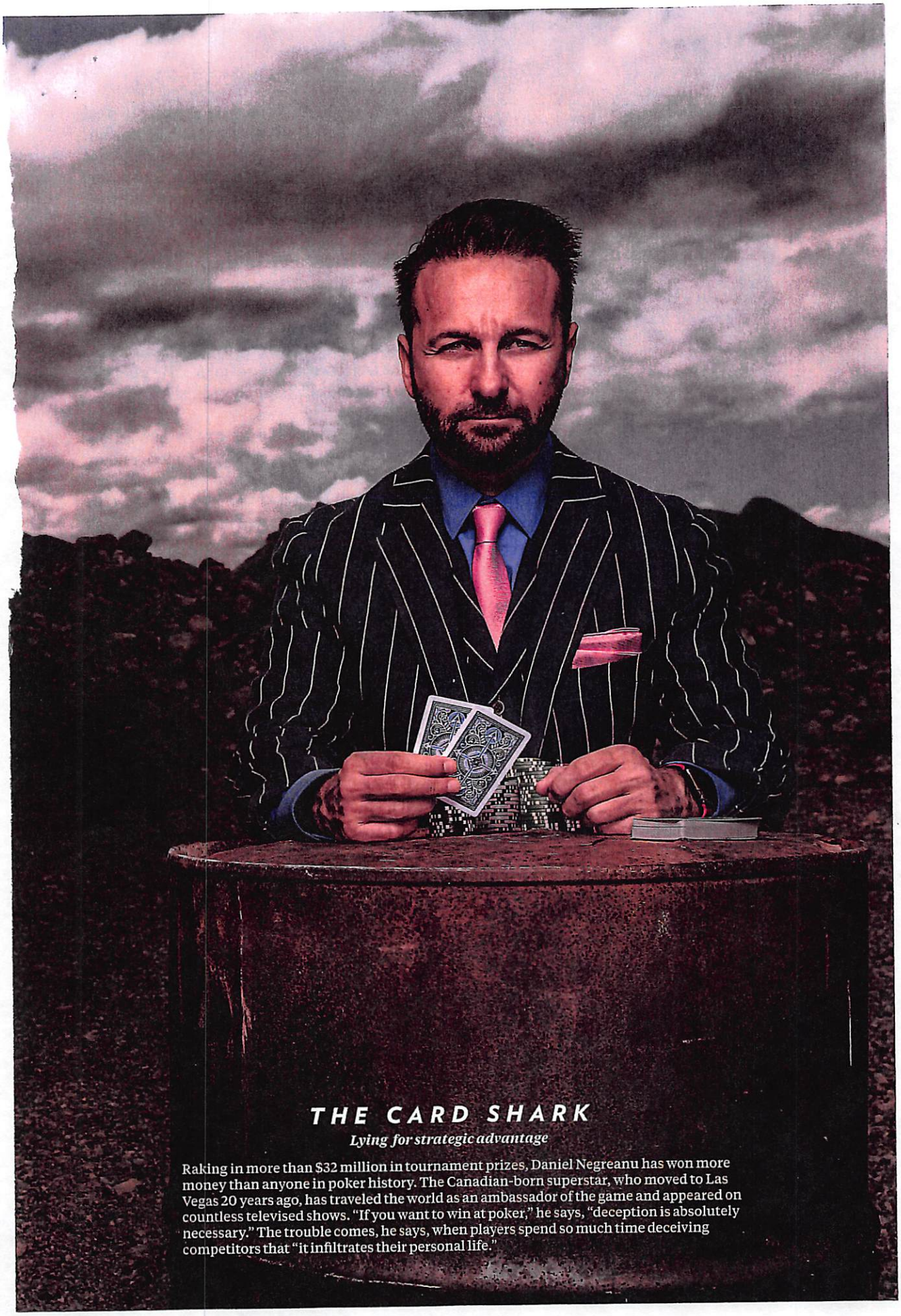
Crowned the female winner of the 1980 Boston Marathon even though she barely broke a sweat, Ruiz denied cheating. Her title was revoked after evidence showed she hadn't run the full course.

13

THE CON ARTISTS

Lying to entertain

Apollo Robbins and Ava Do, who are married and business partners, use sleight of hand to entertain and educate. Robbins is an astonishingly agile pickpocket, perhaps best known for emptying the pockets of some Secret Service agents on a presidential detail. Do is a magician who has studied psychobiology. "We think of deception as the intent to distort someone's perception of reality," they say. "It is an impartial tool that can be used for good or bad, to inform or mislead."

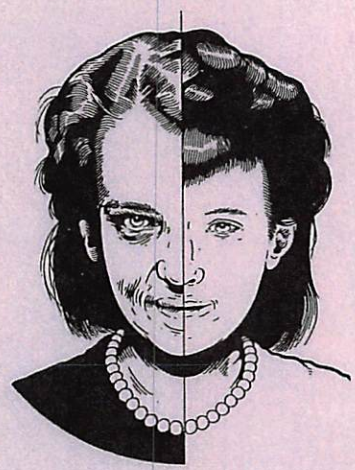


THE CARD SHARK

Lying for strategic advantage

Raking in more than $32 million in tournament prizes, Daniel Negreanu has won more money than anyone in poker history. The Canadian-born superstar, who moved to Las Vegas 20 years ago, has traveled the world as an ambassador of the game and appeared on countless televised shows. "If you want to win at poker," he says, "deception is absolutely necessary." The trouble comes, he says, when players spend so much time deceiving competitors that "it infiltrates their personal life."

IDENTITY THEFT



Many made claims to be the grand duchess of Russia, but all of them were frauds.

IT WAS A GRUESOME CRIME: In 1918 Bolshevik revolutionaries executed Russian tsar Nicholas II, the empress, and their five children. But did Anastasia, the youngest daughter, escape? Several impersonators exploited this hope, most famously Anna Anderson, an Anastasia look-alike who filed an unsuccessful suit in 1938 to try to prove her identity—and claim an inheritance. Anderson, who had supporters as well as detractors, died in 1984. A posthumous DNA test found she was unrelated to the Romanovs and appeared to confirm she was a Polish factory worker named Franziska Schanzkowska.

OTHER FAMOUS FIBS

JOAN LOWELL: *"Any damn fool can be accurate—and dull."*

Lowell famously fabricated her best-selling 1929 memoir, *The Cradle of the Deep,* about childhood adventures aboard a schooner with her sea captain father.

HAN VAN MEEGEREN: *"It was awfully hard work."*

The modestly talented 20th-century Dutch artist pocketed millions of dollars for his forged Vermeer paintings, which he baked in an oven to make the fresh paint look centuries old.

cheating. "Here we give people a chance to steal lots of money, and people cheat only a little bit. So something stops us—most of us—from not lying all the way," Ariely says. The reason, according to him, is that we want to see ourselves as honest, because we have, to some degree, internalized honesty as a value taught to us by society. Which is why, unless one is a sociopath, most of us place limits on how much we are willing to lie. How far most of us are willing to go—Ariely and others have shown—is determined by social norms arrived at through unspoken consensus, like the tacit acceptability of taking a few pencils home from the office supply cabinet.

PATRICK COUWENBERG'S STAFF and fellow judges in the Los Angeles County Superior Court believed he was an American hero. By his account, he had been awarded a Purple Heart in Vietnam. He'd participated in covert operations for the Central Intelligence Agency. The judge boasted of an impressive educational background as well—an undergraduate degree in physics and a master's degree in psychology. None of it was true. When confronted, Couwenberg's defense was to blame a condition called pseudologia fantastica, a tendency to tell stories containing facts interwoven with fantasy. The argument didn't save him from being removed from the bench in 2001.

There appears to be no agreement among psychiatrists about the relationship between mental health and lying, even though people with certain psychiatric disorders seem to exhibit specific lying behaviors. Sociopathic individuals—those diagnosed with antisocial personality disorder—tend to tell manipulative lies, while narcissists may tell falsehoods to boost their image.

But is there anything unique about the brains of individuals who lie more than others? In 2005 psychologist Yaling Yang and her colleagues compared the brain scans of three groups: 12 adults with a history of repeated lying, 16 who met the criteria for antisocial personality disorder but were not frequent liars, and 21 who were neither antisocial nor had a lying habit. The researchers found that the liars had at least 20 percent more neural fibers by volume in their prefrontal cortices, suggesting that habitual liars have greater connectivity within their brains. It's possible this predisposes them to lying because they can think up lies more readily than others,

or it might be the result of repeated lying.

Psychologists Nobuhito Abe at Kyoto University and Joshua Greene at Harvard University scanned the brains of subjects using functional magnetic resonance imaging (fMRI) and found that those who acted dishonestly showed greater activation in the nucleus accumbens—a structure in the basal forebrain that plays a key role in reward processing. "The more excited your reward system gets at the possibility of getting money—even in a perfectly honest context—the more likely you are to cheat," explains Greene. In other words, greed may increase one's predisposition to lying.

One lie can lead to another and another, as evidenced by the smooth, remorseless lying of serial con men such as Hogue. An experiment by Tali Sharot, a neuroscientist at University College London, and colleagues showed how the brain becomes inured to the stress or emotional discomfort that happens when we lie, making it easier to tell the next fib. In the fMRI scans of the participants, the team focused on the amygdala, a region that is involved in processing emotions. The researchers found that the amygdala's response to lies got progressively weaker with each lie, even as the lies got bigger. "Perhaps engaging in small acts of deception can lead to bigger acts of deception," she says.

MUCH OF THE KNOWLEDGE we use to navigate the world comes from what others have told us. Without the implicit trust that we place in human communication, we would be paralyzed as individuals and cease to have social relationships. "We get so much from believing, and there's relatively little harm when we occasionally get duped," says Tim Levine, a psychologist at the University of Alabama at Birmingham, who calls this idea the truth default theory.

Being hardwired to be trusting makes us intrinsically gullible. "If you say to someone, 'I am a pilot,' they are not sitting there thinking: 'Maybe he's not a pilot. Why would he say he's a pilot?' They don't think that way," says Frank Abagnale, Jr., a security consultant whose cons as a young man, including forging checks and impersonating an airline pilot, inspired the 2002 movie *Catch Me if You Can*. "This is why scams work, because when the phone rings and the caller ID says it's the Internal Revenue Service, people automatically believe it is the IRS. They don't realize

HOODWINKING FOR MONEY

A famous swindler lends his name to a fraudulent scheme that still endures.

IN 1919 ITALIAN IMMIGRANT Charles Ponzi built a pyramid scheme around international postal reply coupons. Ponzi, who brought in $250,000 a day at the peak of his scheme (about three million dollars today), conned investors into sending him millions of dollars, promising eye-popping returns. Ponzi's scam—paying one investor with money from others—unraveled in August 1920, when he was charged with 86 counts of mail fraud. In 2008 modern-day Ponzi schemer Bernie Madoff was arrested after bilking investors—including Steven Spielberg, Sandy Koufax, Zsa Zsa Gabor, and Elie Wiesel—out of billions.

OTHER FAMOUS FIBS

CASSIE CHADWICK: *"Oh, let me go, let me go. I'm not guilty, I tell you. Let me go!"*

Chadwick maintained her innocence in 1905 after defrauding banks out of millions of dollars, claiming to be Andrew Carnegie's daughter.

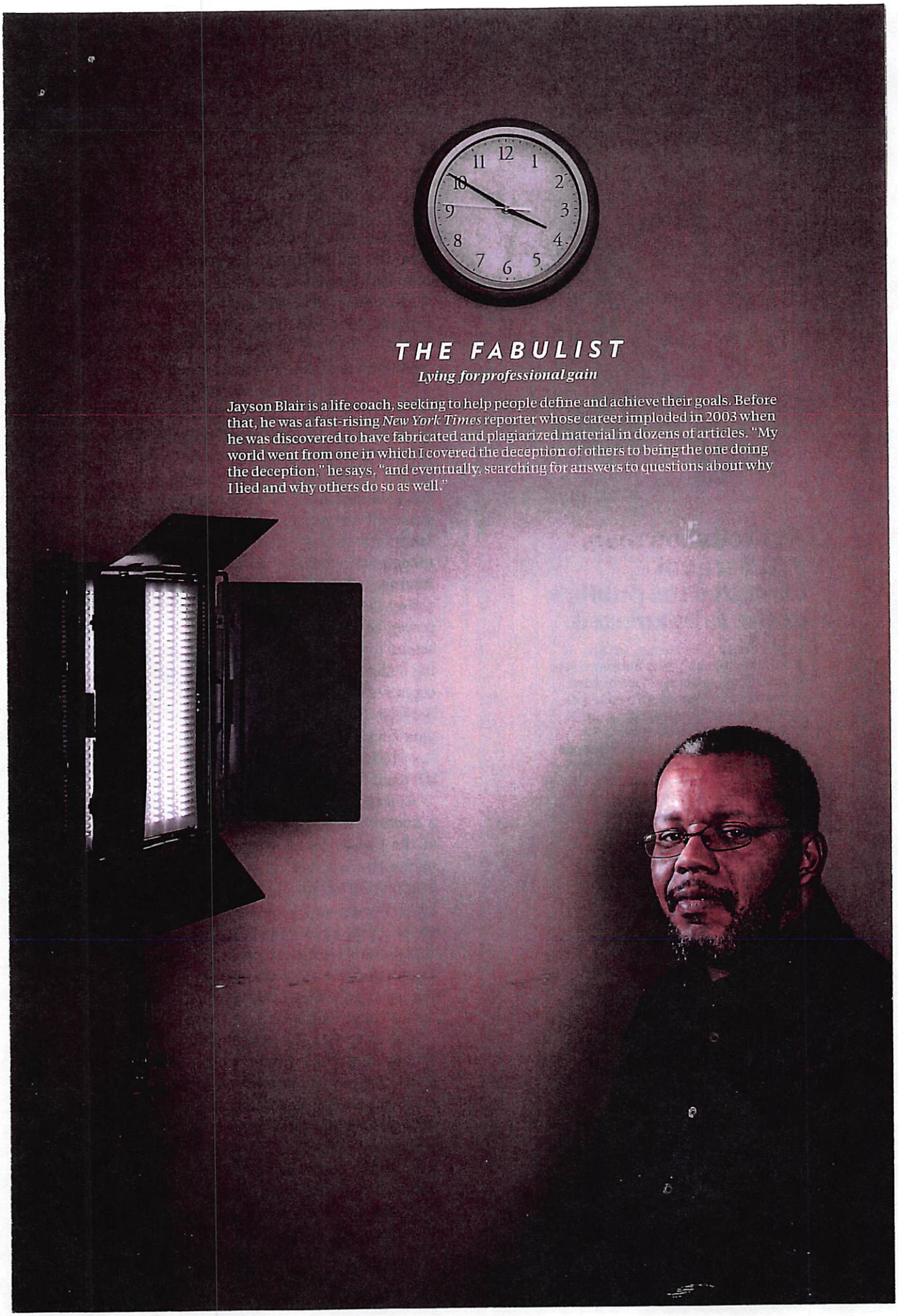
JAMES W. JOHNSTON: *"Cigarette smoking is no more 'addictive' than coffee, tea or Twinkies."*

R. J. Reynolds CEO's written testimony for a 1994 congressional hearing denied what the tobacco industry had known for decades: Nicotine is addictive.

THE PRANKSTER

Lying to tell stories

Some of the Internet's most viral videos and photographs have been staged by a secretive artist known as Zardulu, who rarely reveals the fabrications. "Like all myths," Zardulu says, "mine are established to engender a sense of wonder about the world, to counter our perceived mastery and understanding of it." Zardulu appears wearing a ram's head, symbolizing a journey into the unconscious mind, while the hierophant, an interpreter of mysteries, represents the shadow self.



THE FABULIST

Lying for professional gain

Jayson Blair is a life coach, seeking to help people define and achieve their goals. Before that, he was a fast-rising *New York Times* reporter whose career imploded in 2003 when he was discovered to have fabricated and plagiarized material in dozens of articles. "My world went from one in which I covered the deception of others to being the one doing the deception," he says, "and eventually, searching for answers to questions about why I lied and why others do so as well."

HOAXES FOR ENTERTAINMENT

A gifted showman, P. T. Barnum exploited the public's desire to be amazed.

AT HIS FIRST SPECTACLE, in 1835, showman Phineas Taylor Barnum touted Joice Heth as George Washington's 161-year-old nursemaid. Crowds came gawking to see "the greatest natural & national curiosity in the world." Barnum profited from the public's hunger for entertainment by planting embellishments and lies in newspapers. His fabrication about Heth blew up after her death, when an autopsy found her to be no more than 80 years old. Barnum's flair for fake news culminated when, in ill health, he arranged for the publication of his own obituary so he could read it before he died.

OTHER FAMOUS FIBS

URBAN LEGEND: *"Paul is dead."*

Paul McCartney's rumored death in a 1966 car crash sent Beatles fans hunting for clues in the band's albums, including the 1969 release, *Abbey Road.*

ORSON WELLES: *"I can't imagine an invasion from Mars would find ready acceptance."*

On October 30, 1938, CBS Radio broadcast *The War of the Worlds,* a feigned account about aliens landing in New Jersey. Some listeners panicked, but Welles, who narrated it, expressed surprise that many had fallen for it.

that someone could manipulate the caller ID."

Robert Feldman, a psychologist at the University of Massachusetts, calls that the liar's advantage. "People are not expecting lies, people are not searching for lies," he says, "and a lot of the time, people want to hear what they are hearing." We put up little resistance to the deceptions that please us and comfort us—be it false praise or the promise of impossibly high investment returns. When we are fed falsehoods by people who have wealth, power, and status, they appear to be even easier to swallow, as evidenced by the media's credulous reporting of Lochte's robbery claim, which unraveled shortly thereafter.

Researchers have shown that we are especially prone to accepting lies that affirm our worldview. Memes that claim Obama was not born in the United States, deny climate change, accuse the U.S. government of masterminding the terrorist strikes of September 11, 2001, and spread other "alternative facts," as a Trump adviser called his Inauguration crowd claims, have thrived on the Internet and social media because of this vulnerability. Debunking them does not demolish their power, because people assess the evidence presented to them through a framework of preexisting beliefs and prejudices, says George Lakoff, a cognitive linguist at the University of California, Berkeley. "If a fact comes in that doesn't fit into your frame, you'll either not notice it, or ignore it, or ridicule it, or be puzzled by it—or attack it if it's threatening."

A recent study led by Briony Swire-Thompson, a doctoral candidate in cognitive psychology at the University of Western Australia, documents the ineffectiveness of evidence-based information in refuting incorrect beliefs. In 2015 Swire-Thompson and her colleagues presented about 2,000 adult Americans with one of two statements: "Vaccines cause autism" or "Donald Trump said that vaccines cause autism." (Trump has repeatedly suggested there's a link, despite the lack of scientific evidence for it.)

Not surprisingly, participants who were Trump supporters showed a decidedly stronger belief in the misinformation when it had Trump's name attached to it. Afterward the participants were given a short explanation—citing a large-scale study—for why the vaccine-autism link was false, and they were asked to reevaluate their belief in it. The participants—across the political spectrum—now accepted that the statements

claiming the link were untrue, but testing them again a week later showed that their belief in the misinformation had bounced back to nearly the same level.

Other studies have shown that evidence undermining lies may in fact strengthen belief in them. "People are likely to think that familiar information is true. So any time you retract it, you run the risk of making it more familiar, which makes that retraction actually less effective, ironically, over the long term," says Swire-Thompson.

I experienced this phenomenon firsthand not long after I spoke to Swire-Thompson. When a friend sent me a link to an article ranking the 10 most corrupt political parties in the world, I promptly posted it to a WhatsApp group of about a hundred high school friends from India. The reason for my enthusiasm was that the fourth spot in the ranking was held by India's Congress Party, which in recent decades has been implicated in numerous corruption scandals. I chortled with glee because I'm not a fan of the party.

But shortly after sharing the article, I discovered that the ranking, which included parties from Russia, Pakistan, China, and Uganda, wasn't based on any metrics. It had been done by a site called BBC Newspoint, which sounded like a credible source. But I found out that it had no connection to the British Broadcasting Corporation. I posted an apology to the group, noting that the article was in all likelihood fake news.

That didn't stop others from reposting the article to the group several times over the next day. I realized that the correction I'd posted had not had any effect. Many of my friends—because they shared my antipathy toward the Congress Party—were convinced the ranking was true, and every time they shared it, they were unwittingly, or perhaps knowingly, nudging it toward legitimacy. Countering it with fact would be in vain.

What then might be the best way to impede the fleet-footed advance of untruths into our collective lives? The answer isn't clear. Technology has opened up a new frontier for deceit, adding a 21st-century twist to the age-old conflict between our lying and trusting selves. □

Yudhijit Bhattacharjee, a contributing writer, has also written about deception in his new book, *The Spy Who Couldn't Spell.* He wrote about baby brains in December 2015. **Dan Winters** is an award-winning photographer based in Austin, Texas. This is his first assignment.

SCIENTIFIC FALSEHOODS

Piltdown man, a clever fabrication of a human ancestor, created a sensation.

IN 1912 FOSSIL ENTHUSIAST Charles Dawson and his collaborator Arthur Smith Woodward, a geologist at the British Natural History Museum, announced the unearthing of humanlike skull fragments and an apelike jawbone from a gravel pit near Piltdown, England. Just a few years earlier, Dawson had written to Smith Woodward, saying he was "waiting for the big 'find.'" But Piltdown man, initially hailed as the missing link connecting ape to human, was a fraud: The bones were stained to resemble ancient fossils, and the teeth, from an orangutan, had been filed down to appear human.

OTHER FAMOUS FIBS

HWANG WOO-SUK: *"I created an illusion and made it look as if it were real. I was drunk in the bubble I created."*

The South Korean scientist claimed in 2004 that he had created a stem cell line from the world's first cloned human embryo. His data were fabricated.

MARMADUKE WETHERELL: *"We'll give them their monster."*

The British filmmaker had his stepson build a Loch Ness monster out of a toy submarine, using wood-plastic composite for the head, which appeared in an infamous faked 1934 photograph.