Visual Intelligence

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Sharpen Your Perception, Change Your Life

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Introduction

AS I STOOD in the hallway outside the apartment, everything took on a hazy, slow-motion quality. Shouting echoed behind the door. Dust particles floated in the fluorescent light. A cat mewed from somewhere to my left. The officer in front of me raised his fist to knock, while his partner—tense, armed, ready for action—covered him. As the domestic dispute blared beyond the door, the black hole of the second officer's gun barrel gaped like a silent scream. How had I gotten here?

Since I was little, I had seen the art in everything: in the beautiful asymmetry of sunlight streaming through the trees and the unique patterns of stones and shells left behind when the tide washed out. I was never a particularly creative person myself, but that didn't stop me from studying art history. Following college, though, my upbringing by my scientist father and ultra-practical mother and a desire to serve led me to law school. And this particularly intense police ride-along.

To detach myself from the worry bubbling in my gut, I studied my surroundings as I would a painting, analyzing each nuance, taking stock of both foreground and back, trying to find meaning in small, seemingly incongruent details. I knew this was an unusual way to think—I'd been told so often enough—but I always found my art

background useful in the practice of law, where the need to be an objective observer is critical.

And then I had a terrible thought: what if the officers I was with didn't have these skills? What the first officer saw when the door opened—be it a crying baby, a confused elderly woman, or a gun-wielding madman—and how he conveyed it to his partner in that split second would affect the outcome for every one of us. My life was in the hands of a virtual stranger and his ability to see and accurately convey what he saw.

Thankfully the police were able to defuse the situation and my experience didn't end in disaster, but as generally happens when we're nose-to-nose with a deadly weapon for the first time or forced to face our own mortality, it haunted me for years after. How many times do our lives depend upon someone else's observation skills? For most of us, it's too many to count: whenever we get on an airplane or a train, into a taxicab, or onto an operating table. It's not always life-or-death; sometimes it's just life-altering. Other people's attention to detail and follow-through can also affect our job, our reputation, our safety, and our success. And we can affect theirs. It's a responsibility we shouldn't take lightly, as it can mean the difference between a promotion and a demotion, between a triumph and a tragedy, between a normal Tuesday in September and 9/11.

Seeing clearly and communicating effectively are not rocket science; they're straightforward skills. We're born hardwired for both. But more often than we'd care to admit, we fail to use these skills. We show up at the wrong airport gate and try to board the wrong plane, we send an email to the wrong recipient saying something we never should have said, we miss a key piece of evidence that was staring us right in the face. Why? Because we're hardwired for those errors as well.

Our brains can see only so much, and can process even less. I knew this from years of practicing law and witnessing firsthand the unreliability of eyewitnesses and the fallibility of first-person accounts, but it wasn't until I followed my heart back to the art world that I began to actively investigate the mysteries of perception. As the head of education of The Frick Collection in New York City, I helped bring a course created by a dermatology professor at Yale to NYC medical schools, teaching students to analyze works of art in order to improve their patient observation skills. It was very successful—a clinical study found that the students who took the course had diagnostic skills that were 56 percent better than peers who didn't—and I wanted to understand the science behind it. I wanted to know more about the mechanics of how we see and how simply looking at art could improve.

I became a neuroscience fanatic, reading all the research I could find and interviewing the researchers who'd conducted it. I even signed up for an online community neuroscience "video game." And I discovered that while my own perceptions about how we see were wrong on many levels—apparently the retina is part of the brain, not the eye—they were spot-on in the most important ways: while we might not fully understand the human brain, we can change it. We can train our brains to see more, and to observe more accurately.

And as I often do when I learn something fantastic, I wanted to share it with everyone, not just medical students. I was out to dinner with friends sharing some of what I learned one night soon after 9/11, when the city was still reeling from the terrorist attacks and resulting stories of heroism and heartbreak. One of my friends asked if I had considered training first responders. I hadn't, but as I thought back to my fear in the hallway on that law student ride-along, not knowing how the officers I was with would see or react to what they saw, it made perfect sense. I fell in love with the idea of pairing cops with Rembrandt; I just had to convince the law enforcement community. The following Monday I cold-called the NYPD.

"I'd like to bring your cops to our museum to look at art," I told the bewildered deputy commissioner. I half expected him to hang up on me, but to his credit, he agreed to give it a try. Within a few weeks, we had weapons in the Frick for the first time ever, and The Art of Perception® was born.

I've been teaching the class for fourteen years now, training officers from thirteen divisions of the NYPD, as well as the police departments in Washington, DC, Chicago, and Philadelphia, the Virginia State Police, and the Ohio Association of Chiefs of Police. Word

of the program's effectiveness spread quickly, and my client list grew to include the FBI, the Department of Homeland Security, Scotland Yard, the US Army, Navy, National Guard, Secret Service, and Marshal Service, the Federal Reserve, the Department of Justice, the State Department, and the National Park Service.

The *Wall Street Journal* soon profiled my class and its positive effects on the law enforcement, legal, and military sectors in a story about an undercover FBI agent who credited my training with helping him sharpen his observation skills. After taking The Art of Perception, the agent was able to collect incriminating evidence against a Mob-controlled garbage collection syndicate that resulted in thirty-four convictions and the government seizure of $60 to $100 million in assets. Almost immediately, I started getting calls from private companies, educational institutions, and even workers' unions. Because in reality, all of us—parents, teachers, flight attendants, investment bankers, even doormen—are first responders on some level.

The Art of Perception's unique pedagogy has been called "invaluable" by the Department of Defense and credited with "stimulating the innovative thinking necessary to generate viable future war-fighting concepts" by the chief of naval operations. After attending my seminar at an FBI National Academy program, Inspector Benjamin Naish arranged for me to present to the Philadelphia Police Department, stating, "I felt like I had my eyes opened wider [in this course, and I knew it was] the most unusual training they're ever going to have a chance to see."

What's so unusual about it? I show pictures of naked women with breasts sagging on their stomachs and sculptures made from urinals to teach the fine art of accurate observation and effective communication.

And it works.

I've helped thousands of people from dozens of walks of life—law firms, libraries, auction houses, hospitals, universities, Fortune 500 companies, entertainment companies, banks, unions, and even churches—strengthen and sharpen their visual analysis and critical-thinking skills. And I can teach you.

Because medical and law enforcement professionals aren't the only ones who need to know how to identify pertinent information, prioritize it, draw conclusions from it, and communicate it. We all do. A single missed detail or miscommunicated word can just as easily botch a cappuccino order, a million-dollar contract, or a murder investigation. I know because every week I stand in front of the best and the brightest and watch as they miss critical information . . . over and over again. No one is immune to this failure to see, not presidents or postal workers, not babysitters or brain surgeons.

And then I watch them get better. Whether I'm teaching customer service or information technology agents, artists or archivists, students or surveillance experts, people who are already very good at their jobs *invariably* get even better. I watch the transformation every single session, and I'm delighted to have the opportunity to help you transform as well.

JR, Women Are Heroes, Kenya:
Self-Portrait in a Woman's Eye, Kenya, 2009.

This photograph is a self-portrait of the artist JR—or at least one perspective of him in someone else's eye. JR had a problem in that he was becoming increasingly famous for his photographic portraits that were blown up to billboard size and attached to the tops and sides of buildings all over the world—to "put a human face to the

most impoverished areas of the world"—but since he never got permits for them, warrants for his arrest had been issued in several countries. He was asked to create a self-portrait but was hesitant to show his facial attributes out of fear it might facilitate his arrest. His solution: *Self-Portrait in a Woman's Eye.* I love this photograph because it encapsulates exactly what The Art of Perception is all about: shifting our perspective and our expectations further than we ever thought possible.

Think of this book as your new self-portrait. You can use it to step back and see yourself through new eyes. What do you look like to the world? How well do you communicate? How well do you observe? What's behind you and around you and inside you?

From this book, you'll learn how to sharpen your own inherent intelligence gathering, strategic and critical thinking, decision making, and formulation of inquiry skills using the amazing computer between your ears. Unlike other books by psychologists or reporters, though, this one will not just *tell* you what your brain can do or how people are using theirs to the limit, it will show you.

We'll use the same interactive training I use to engage leaders around the globe. We'll practice reconciling larger concepts with more specific details, articulating visual and sensory information, and conveying it in an objective and precise manner with the help of water lilies, women in corsets, and a nude or two.

Take a look at the photograph on the next page. It hasn't been retouched or digitally altered; what you see actually existed this way. What do you think is going on in the photograph, and where was it taken?

The most common answer I get is flowers in an old abandoned building for some kind of art installation. And that's partially correct. It is an old building, those are real flowers, and they were put there intentionally by an artist. What kind of building do you think it is? We see a hallway with many doors, and a window at the end of that hallway. People guess it's an office building or some kind of school, but it's not. It's something most people never consider: a psychiatric hospital.

Anna Schuleit Haber, *Bloom: A Site-specific Installation,* 2003.

When the Massachusetts Mental Health Center was slated for demolition after ninety years in service to make way for more modern facilities, artist Anna Schuleit Haber commemorated its closing by filling it with what it had always lacked. (Sadly, she was inspired by her observation that patients in psychiatric hospitals rarely receive flowers, as there are no wishes for a speedy recovery.) Her resulting installation, *Bloom,* turns our thinking about mental health care upside down. We do not associate vibrant color with a deteriorating building or expect to see life oozing from the halls of a psychiatric facility. In the same way, this book will alter the way you observe the world. You will see color and light and detail and opportunity where

you swore there were none. You will see life and possibility and truth in the emptiest spaces. You will see order and find answers in the most chaotic and messiest places. You will never see the same way again.

All of my requests for The Art of Perception live presentation come from enthusiastic referrals because once people's eyes are opened, they can't shut their mouths about it. They want everyone to experience the same revelation and reward. Past participants flood my email in-box with stories of how the training gave them more confidence in their jobs, helped them win promotions, improved their customer service, saved their companies hundreds of thousands of dollars, doubled and tripled their fund-raising outcomes, raised their standardized test scores, and even kept their children out of unnecessary special education classes.

Learning to see what matters can change your world as well. I invite you to open your eyes and see how. I bet you'll discover you didn't even know they were closed.

Part I

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Assess

We find only the world we look for.

— HENRY DAVID THOREAU

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Leonardo da Vinci and Losing Your Mind

The Importance of Seeing What Matters

WHEN DERRECK KAYONGO stepped into the shower in his Philadelphia hotel room, he noticed something that millions of business travelers and families on holiday before him had seen and not paid any particular attention to: the tiny bar of soap on the corner shelf. It was different. Instead of the smooth green oval he had used the evening before, a small cardboard box sat in its place. Inside was a brand-new bar of soap.

The Ugandan native, who as a child had left everything behind when he and his family fled Idi Amin's murderous dictatorship, was a recent American college graduate, and on a tight budget. He turned off the water, dressed, and took the unused soap down to the concierge desk.

"I want to make sure I am not charged for this," he told the employee. "I have not used it, and do not need it."

"Oh, don't worry, it's complimentary," the concierge answered.

"Thank you, but I already got one yesterday when I arrived," Kayongo explained. "Where is that one?"

"We replace the soap every day for every guest," the concierge assured him. "No charge."

Kayongo was shocked. Every room, every day? In every hotel? Throughout America?

"What do you do with the old bars?" he asked. Unlike the slivers of soap used in the African refugee camps he had grown up in, the bar from his shower was fairly substantial; it seemed almost brand-new even after he had used it.

"Housekeeping throws them away," the concierge said, and shrugged.

"Where?"

"Just the regular trash."

"I'm not a great mathematician," Kayongo tells me, "but I quickly realized that if only half of the hotels did this, it was an incredible amount of soap—hundreds of millions of bars just being dumped into landfills. I couldn't get it out of my head."

Kayongo called his father, a former soap maker, back in Africa and told him the news. "You won't believe it. In America, they throw away soap after they have used it only once!"

"People there can afford to waste soap," his father told him.

But in Kayongo's mind it was a waste no one could afford, not when he knew more than two million people, most of them toddlers, still died every year from diarrheal disease, a malady easily prevented by the simple act of washing one's hands with soap. Soap was a luxury item many in Africa could not afford, yet in America it was simply thrown away. Kayongo decided to try to do something with his new country's trash to help his old country.

Back home in Atlanta, he drove around to local hotels and asked if he could have their used soap.

"At first they thought I was crazy," he remembers, a smile spilling through his voice over the phone. "Why do you want those? They are dirty. Yes, that was a problem, but we can clean them. We can clean soap!"

Kayongo found a recycling facility to scrape, melt, and disinfect the bars of soap he collected, and the charity Global Soap Project was born. He has since recycled one hundred tons of soap and distributed repurposed, life-saving bars along with a hygiene education program to people in thirty-two countries on four continents. In 2011, Kayongo was deservedly named one of CNN's "Heroes."

Unlike the heroes of old movies and swashbuckling fables, we don't have to be the strongest, fastest, smartest, richest, handsomest, or luckiest to get ahead or make a difference in the world. The most successful people in modern times—people such as Bill Gates, Richard Branson, Oprah Winfrey, and Derreck Kayongo—prove that it doesn't matter what physical attributes we have or don't, our level of education, our profession, our station in life, or where we live.

We can survive and thrive today if we know how to see.

To see what's there that others don't. To see what's not there that should be. To see the opportunity, the solution, the warning signs, the quickest way, the way out, the win. To see what matters.

Even if we don't long for front-page accolades, acute and accurate observation yields rewards big and small across all aspects of life. When a housekeeper at a Minneapolis hotel noticed a young girl alone in a room who wouldn't make eye contact, wasn't dressed for the cold weather, and had no luggage, she reported it, and helped uncover an international sex trafficking ring. When an astute waiter at a crowded Israeli coffeehouse noticed that the schoolboy who asked for a glass of water was sweating profusely while wearing a heavy overcoat on a mild day, he looked more intently and saw a small wire sticking out of the boy's large black duffel bag. His observation kept the boy from detonating a large explosive that the local police chief said would have caused "a major disaster."

The ability to see, to pay attention to what is often readily available right in front of us, is not only a means to avert disaster but also the precursor and prerequisite to great discovery.

While millions of people have enjoyed using a new bar of hotel soap each day, only Kayongo saw the potential for a life-saving recycling program. What made him see exactly the same thing that others had, but see it in a different way? The same thing that allowed Swiss hiker George de Mestral to look down at his burr-covered socks and see a new type of adhesion; Mestral's discovery of what he christened Velcro revolutionized the way astronauts and skiers suited up, saved an entire generation of kids from learning how to tie their

shoes, and still posts $260 million a year in sales. The same thing that made Houston mom Betsy Ravreby Kaufman see plastic Easter eggs as a way to cook hard-boiled eggs without their shells. Tired of wasting food and time when the process of peeling eggs left behind a mess, Kaufman envisioned boiling eggs in an egg-shaped container from the start, thereby eliminating the need for shells altogether. Her invention, Eggies, plastic egg-size cups with lids, sold more than five million units in 2012 alone. The same thing that helped propel Apple icon Steve Jobs to the top of the technological heap: an ability to see. Jobs reported, "When you ask creative people how they did something, they feel a little guilty because they didn't really do it, they just saw something."

Leonardo da Vinci attributed all of his scientific and artistic accomplishments to the same concept, which he called *saper vedere* ("sah-PEAR veh-DARE-ay")—"knowing how to see." We might also call his gift "visual intelligence."

It sounds easy, doesn't it? You just have to see. We're born with the inherent ability; in fact, our body does it involuntarily. If your eyes are open, you are seeing. But there's more to the neurobiological process than just keeping your eyelids propped up.

A BRIEF BIOLOGY OF SIGHT

I'm not a scientist, but I was raised by one—my father is a parasitologist—so I knew that the best way to investigate why we see the way we do was not to just read the cutting-edge studies on human vision and perception but to go out and meet the people who conducted them. My first stop: Dr. Sebastian Seung.

Thanks to his captivating TED talk and EyeWire, the visionary retina-mapping project he heads, Dr. Seung is something of a rock star in neuroscience. As I pull open the front doors of his lab at the new Princeton Neuroscience Institute, a labyrinthine complex of glass and aluminum, I can feel my blood pressure rise. The building is intimidating from the first step. There is no receptionist or directory listing, just an unmarked, open elevator. I step inside and quickly determine that I might not be smart enough for the building. I can't get the elevator to move; push and hold as I might, the buttons won't stay lit. There is no signage, no slot for a key card.

Help arrives in the form of an affable young student wearing a LINEAR ALGEBRA IS MY HOMEBOY T-shirt. He presses his ID against a small glass panel, and we rise. I tell him whom I'm here to see.

"Good luck," he says with a smile. I hope I won't need it.

Returning to Princeton is something of a full-circle moment for me, as I moved to the town for my first job out of law school and lived just off Nassau Street for five years. To keep my sanity, on the weekends I volunteered as a docent at the Princeton University Art Museum.

When I meet Dr. Seung and see that he's wearing a Mickey Mouse T-shirt, I instantly relax. Seung exudes an easy charm and has a gift for making the extraordinarily complex seem not so. As he explains, seeing doesn't have as much to do with our eyes as I once thought.

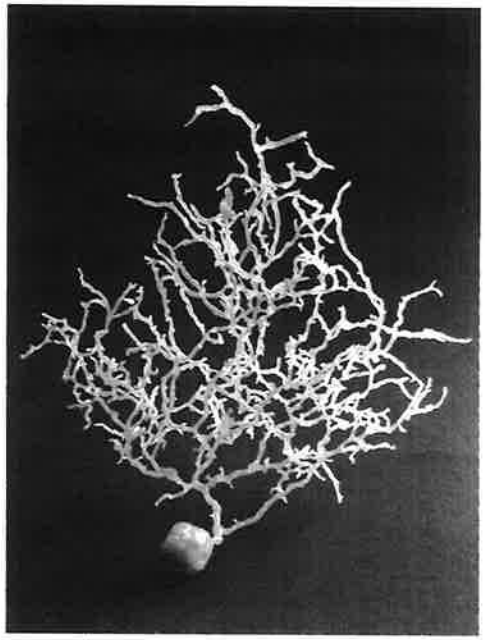
While our sense of sight is most often associated with the spherical organs that occupy the orbits of the skull, the brain is really the workhorse of the visual processing system. Not only does processing what we see engage a full 25 percent of our brain and over 65 percent of all our brain pathways—more than any of our other senses—it begins in a part of the eye that is really the brain.

The process starts when light passes through the pupil of our eye and is converted into electrical patterns by neural cells on a membrane at the back called the retina. When I tell Seung I remember learning in high school that the retina is like the film in a camera, he shakes his head at this common misconception.

"It's definitely not film," he says. "The retina's such a complicated structure that it's not even a camera. It's more like a computer."

The retina isn't a passive pathway but a part of the brain itself formed in utero from neural tissue.

"Studying the retina is our easiest way into the brain," Seung explains, "because it is the brain."



3D printout of a neuron.

To thank him for introducing me to the beauty and complexity of the retina, and for referring me to scores of other scientists, I have brought him a gift: one of the first-ever 3D-printed neurons.

I had downloaded the printable file, a J cell named IFLS mapped for EyeWire by citizen scientists, from the National Institutes of Health (NIH) 3D Print Exchange, and then visited my local MakerBot store, which had the technology to print out a vastly enlarged replica of the neuron. The delicate sculpture resembled a lumpy seed, reminiscent of a tiny brain itself, sprouting a serpentine system of slender branches, the dendrites that conduct the electrical messages between cells.

I have seen the network of retinal neurons laced together—referred to as "the jungle" by Seung—in the EyeWire computer program he runs, each neuron a different neon color to make its paths more apparent, but as I hold it in my hand, the importance of each connection is magnified. With 100 million retinal receptors, the retina not only does the bulk of image preprocessing, it must also spatially encode or compress an image before it is sent along the 1.2 million axons in the optic nerve traveling to the brain.

"Some of the first steps of perception are actually happening inside the retina itself, even before the information reaches the brain," Seung asserts.

This explains why it is easier to transplant or artificially create other organs than working prosthetic eyes, since they are so intricately interwoven with our brains.

What this all boils down to is that we don't "see" with our eyes; we see with our brain.

USE IT OR LOSE IT

Our ability to see, make sense of what we see, and act upon that information relies on the brain's incredible processing power, a power that is entirely dependent upon our neural connections. Assuming all of our physical wiring is healthy and intact, turning visual inputs into meaningful images takes time, time that increases with age or lack of use.

Scientists have discovered that as we slow down or stop flexing our mental muscles, the speed of neural transmission dramatically slows, which in turn leads to a decrease in visual processing speed, the ability to detect change and movement, and the ability to conduct a visual search. Since our brain controls every function of our body, any lag in neural processing will likewise cause a delay in other systems, including what we see and how we react to it. Slower reflexes and remembrance times aren't caused only by physical aging. It might be that we just haven't exercised our brains enough or in the right way.

Fortunately for all of us, throughout our lives, our brain is continually making new connections and reinforcing old ones based on learning experiences . . . as long as we are learning. Researchers have found that stimulating environmental input—like studying something new, reading about a concept that makes you think, or playing any kind of "brain games"—will increase cortical growth at *every*

age, even among the very oldest humans. Just as cognitive conditioning can be used to stave off dementia, it can also be used to sharpen our ability to observe, perceive, and communicate. If we can keep our senses and our wits quick, our reactions will follow, making us better employees, better drivers, and more capable of caring for ourselves and others longer in life.

To stimulate our senses and set our neurons ablaze we'll employ the same techniques I use with the FBI, intelligence analysts, and Fortune 500 companies every day in my class: we'll study art.

Jan Steen, *As the Old Sing, So Pipe the Young*, 1668–1670.

Carel Fabritius, *The Goldfinch*, 1654.

WHY ART?

Looking at old paintings and sculptures is definitely not the first thing most people think of when I tell them we're going to get their neurons firing and increase their brain-processing speed. They picture engaging in cutting-edge 3D computerized training or at least wearing Google glasses while walking down a busy street, not strolling through a museum viewing objects that have sat still for hundreds of years. But that's exactly the point: art doesn't walk away. If you want to study human behavior, you can park yourself somewhere public and people watch: guess at who they are, why they're dressed that way, where they're going . . . until they leave. And you'll never know if you're right or not. Or you could analyze works of art that we have the answers to: the who, what, where, when, and why. Art historian David Joselit describes art as "exorbitant stockpiles of experience and information." It contains everything we need to hone our observation, perception, and communication expertise.

If you can talk about what is happening in a work of art, you can talk about scenes of everyday life; you can talk about boardrooms and classrooms, crime scenes, and factory floors. The Department of the Army retained me to work with officers before they were deployed to the Middle East. Why? Because when they go overseas, they encounter the unexpected and the unknown. The army teaches them cultural differences and etiquette, but I teach them how to be effective communicators in unfamiliar situations. Describing what you see in a painting of a woman wearing a foot-long, four-layered starched collar uses the same skill set as describing what you see in a foreign market or international airport. I teach the same techniques to hiring managers so they can better describe the candidates they are interviewing, and to elementary school principals so they have more effective tools for evaluating their teaching staff.

Art gives us myriad opportunities to analyze complex situations as well as seemingly more straightforward ones. Ironically, it is often the simple, the everyday, and the familiar that we have trouble describing because we have ceased to notice what makes them inter-

esting or unusual. By adulthood, we become so inured to the complexity of the world that only the new, the innovative, and the exigent capture our attention and dominate our field of vision. We rely on experience and intuition rather than seeking out nuances and details that can make a difference in our success. Yet it is the things that we see and negotiate on a regular basis to which we must be especially attuned.

To be a hero to our bosses, our families, and ourselves, we need to shake up our worldview and shift our perspective. Art enables us to do that because we see it in so many places, because it manifests themes of human nature in all their complexity, and because it often makes us uncomfortable. And surprisingly, discomfort and uncertainty bring out the best in our brains.

When we're forced to use our personal and professional skills in an unfamiliar venue—which art analysis is for most people—we engage an entirely new thought process. In 1908, Harvard psychologists discovered that the brain is most effective at learning new material when stress hormones are slightly elevated by a novel experience, a theory verified by modern brain imaging. Therefore, the best way to rethink something we've been doing for years—the way we do our jobs, the way we interact with others, the way we see the world—is to step outside of ourselves, and outside of our comfort zone.

Art transports us away from our everyday life to rethink how we see and perceive and communicate. Art inspires conversations, especially when it makes us squirm. There are women with noses where their eyes should be, men in curlers with manicures, clocks dripping from trees, spider-legged elephants, and lots of people screaming.

Part of the beauty of art, especially the more unsettling pieces, is that anyone can discuss it. You don't have to be an art historian to talk about what you see; in fact, I prefer that most of my participants have little or no art training because it's completely unnecessary to strengthening our observation and communication skills and it might color their ability to view works of art objectively. We're not studying brushstrokes or palettes or historical periods. We're simply using art as confirmable visual data, talking about what we see—or what we think we see.

Gerrit van Honthorst, *Smiling Girl, a Courtesan, Holding an Obscene Image*, 1625.

Throughout the book, we'll use images of painting, sculpture, and photography—some you may have seen and some you might not be able to imagine are real—as tools to reconsider the way we've previously looked at the world. Take this portrait of a young woman. You don't have to know who painted it or from what art-historical era it hails to investigate and discuss it. How would you describe her? Handsome or homely? As we'll learn, both descriptions are subjective, grounded in the eye of the beholder, so neither is useful in a professional context where the objective is everything. What about the term "Caucasian"? Is that objective? Yes, but is it accurate? "Caucasian" can broadly refer to people with a white skin tone or more specifically to those who come from the area of the Caucasus mountain range between Europe and Asia. Where

does that leave a light-skinned person from Australia or a dark-skinned person from Turkey? Did you notice the enormous feather on her head, the dimple on her left cheek, the ring on her finger, or that she's holding a painting of someone's naked backside? What about her own exposed cleavage? Is that an objective or even appropriate detail to talk about?

You'll know the answers and many more once we've mastered the core of the Art of Perception program—I call them "the four As"—how to assess, analyze, articulate, and adapt. We'll start with how to *assess* a new situation by studying the mechanics of sight and our built-in blindness, and I'll give you an orderly process for efficient, objective surveillance. Once we've figured out how to gather all of the information, we'll learn what to do with it: how to *analyze* what we have uncovered, including prioritizing, recognizing patterns, and the important difference between perception and inference. Finding what we find and knowing what we know are no good if we don't tell someone else, though, so next we'll work on how to *articulate* our discoveries to ourselves and others. And finally, we will look at ways to *adapt* our behavior based on the first three elements.

But before we begin, I have one more, very important *A* for you: *autopilot*. Turn it off.

AUTOPILOT

Alexander Graham Bell was sixty-seven years old when he took the stage at the Sidwell Friends School in Washington, DC, to deliver the graduation address to the class of 1914. Sporting a snowy beard that swooped up at the end, the communications pioneer was now a grandfather and nearing the end of his illustrious career. Although he was best known for inventing the telephone, he held thirty patents and had foreseen modern advances such as air conditioning, the iron lung, metal detectors, and the use of solar panels to heat a house. So it surprised the crowd when he confessed to being inattentive.

As he told the audience, he had recently taken a walk around his family's long-held property in Nova Scotia, land he believed he was intimately familiar with. He was shocked to discover a moss-covered valley that led to the sea.

"We are all too much inclined," he said, "to walk through life with our eyes shut. There are things all round us and right at our very feet that we have never seen, because we have never really looked."

Habit, boredom, laziness, overstimulation—there are many reasons we tune out. And in doing so, we miss out. We might brush off something as simple as how a burr attaches to a sock and miss an opportunity for riches. We might overlook something as commonplace as a travel-size bar of soap and miss a chance to better the world. What amazing innovation did Bell miss by not always being attuned? What have we ourselves missed?

Zoning out leads to more than just missed opportunities. The tendency to "shut down" or get lost "in the fog" when doing things we've done a million times before, like driving, or when we're in busy, crowded environments, like a train station, can put us in physical danger.

I was in a Metro station in Washington, DC, recently, studying the people surrounding me as I now know to do. I saw businesspeople and friends chatting, children holding their parents' hands, students lugging heavy backpacks. And then I noticed a man sitting on the steps; he had a wiry, dirty beard, wore threadbare, soiled clothes, and scowled while he chipped away at the wall with something sharp. No one nearby paid any attention to him. When the train rolled in, he stood up, shoved the shank into his pocket, and stumbled onto a car with dozens of other people. How many of them would have chosen a different car had they seen him five minutes before? Being oblivious to their surroundings put them in a closed car with a disturbed man concealing a sharp object in his pocket. How does an entire person escape the view of so many others? Because not only do we fail to look, we are often also wearing electronic blinders in the form of earbuds and smartphones.

When we walk through the world on autopilot, our eyes might seem to take everything in, but in reality we are seeing less than we could if we were paying closer attention. As we'll learn in later chapters, attention is a finite resource that our brains must delegate. We

do ourselves and our attention spans a great disservice when we are not fully engaged.

THE AGE OF DISTRACTION

Thanks to a wireless web with a constant flow of information available to us anytime, anywhere, there are more things competing for our attention than ever before. Today more people have access to cell phones than to working toilets, and the average person checks his phone *110 times a day* and nearly once every 6 seconds in the evening. Our perpetual, byte-size interactions are not only a detriment to our concentration, focus, productivity, and personal safety, but they're also hurting our intelligence. A 2005 study at King's College at London University found that when distracted, workers suffered a ten- to fifteen-point IQ loss—a greater dumbing down than experienced when smoking marijuana. A fifteen-point deficiency is significant, as it brings an adult male down to the same IQ level as an eight-year-old child.

Our brain's prefrontal cortex is responsible for analyzing tasks, prioritizing them, and assigning our mental resources to them. When we inundate it with too much information or make it switch focus too quickly, it simply slows down. How much? The *Journal of Experimental Psychology* reported that students who were distracted while working on complicated math problems took 40 percent longer to solve them.

Ironically, compounding the problem is our need for speed. The immediacy of information delivery in today's world has also created a culture that places a premium on speed, spontaneity, and efficiency, but those ideals come at a cost. In the hospitality industry, the desire for a quicker room turnaround negatively affected both employee safety and customer satisfaction. As the daily room-cleaning quota for hotel housekeepers rose from fourteen rooms per shift in 1999 to twenty rooms in 2010, so did the injury risk rate, rising from 47 percent to 71 percent. While the changes meant that the management companies saved money on staffing, healthcare costs for the injured workers rose, and the properties' cleanliness—the number one reason guests don't return to a hotel—was compromised. In 2012, scientists found that the level of colony-forming units of bacteria on surfaces in hotel rooms was twenty-four times higher than what hospitals deem the "highest limit acceptable."

Similarly, in the managed-healthcare world, where monetary rewards are given for seeing as many patients as quickly as possible, medical professionals can be tempted to sacrifice quality care for quantity care and go straight for the patient's chart in an effort to expedite the visit, relying on what the caregiver before them has written before personally evaluating a patient and making observations of their own.

Thankfully, there is a natural and easy buffer against letting the stress of speed and the steady stream of distraction overwhelm us: simply slowing down. In a commencement speech at Sarah Lawrence College, industrial designer and "Mythbuster" Adam Savage reminded the 2012 graduates that they didn't have to be in a constant hurry, that they in fact had plenty of time: "You have time to fail. You have time to mess up. You have time to try again, and when you mess that up, you still have time." Savage also reminds us of the ironic pitfall of impatience: "Rushing leads to mistakes, and mistakes slow you down far more than slowing down does."

In 2013, researchers at Princeton University and the University of California, Los Angeles, found that students who handwrote lecture notes rather than typing them out retained more of the information precisely because they were slowed down. A quick keyboard transcription doesn't require critical thinking. The slower process of handwriting means not everything will be captured verbatim; instead the brain is forced to exert more effort to capture the essence of what's important, thus committing the information more effectively to memory.

Slowing down doesn't mean being slow, it just means taking a few minutes to absorb what we are seeing. Details, patterns, and relationships take time to register. Nuances and new information can be missed if we rush past them.

TRUST YOURSELF

In July 2013, Beyoncé stopped her concert in Duluth, Georgia, to remind a fan that he was missing the opportunity of a lifetime. In her self-professed favorite part of the concert, she offered her microphone to a select few people from the audience to allow them to sing the song "Irreplaceable" with her. One lucky gentleman she picked, though, couldn't stop recording her with his camera phone long enough to get the words right.

"You can't even sing 'cause you're too busy taping," she scolded. "I'm right in your face, baby. You gotta seize this moment. Put the damn camera down!"

Portable technology is not just a sensory distraction; we allow it to be a sensory substitution. I'm always confounded when I see people taking pictures of iconic paintings in museums, especially when they jostle for space, snap the shot, and then walk away. The resulting image, mediated through a camera lens, is not the same as a close, careful observation of the work. It is akin to reading the wall label next to a work of art and then failing to examine the object it describes. Writer Daphne Merkin voiced the same sentiment recently, recalling her inability to enjoy Vermeer masterpieces in Amsterdam's Rijksmuseum because they were "blocked by a throng of phones." She wrote, "I wonder what part of the experience gets lost in the hubbub. Instead of your own lens being enough, everything gets distilled through a second LCD screen. You end up living life removed, dissociated from your own sensations, perceptions, and feelings."

One of the first things I encourage participants in my class to do is put their phones away. I'd rather they not record the information electronically or take pictures for one simple reason: I want them to trust themselves. I don't want them to rely on anything else except what's within them: their inherent sense of observation, their intuition, and their ability to comprehend and retain information.

Everyone is generally very nervous at first, especially if they work in jobs that are report-driven. But I assure them, as I do you, that if you simply engage all of your senses, they will deliver everything you need and more. Your brain is more powerful than any gadget. Just turn it back on.

Dr. Sebastian Seung turned his retina research into a crowd-science project because computers couldn't handle it. When he and his team tried to map images of the retinal neurons taken with an electron microscope by applying artificial-intelligence algorithms, they discovered that it couldn't be done without human help. Believe it or not, computers can't recognize patterns or transform 2D images into 3D objects as effectively as the human brain can. Essentially Seung needed neurons to map neurons.

Similarly, the first iterations of the Art of Perception program evolved at medical schools because instructors such as Dr. Glenn McDonald noticed that their new students were relying too much on advanced technology and not enough on their own powers of observation. McDonald says, "Students need to realize that no matter how helpful technology has become, it is no match [for] a good set of eyes and a brain."

To get our own brains and eyes engaged and focused, we're going to look at a well-known work of art, one you may have seen before. But we're going to observe it more slowly than most people ever would. If you can, plant yourself in an area where you won't be distracted or disturbed. If you can get out of your normal surroundings, even better. Now look at the painting on the next page. There is no specific assignment here; I just want you to look. What do you see? List everything, in your mind or on paper.

Look at it for as long as you like. The average museum visitor spends seventeen seconds viewing each work of art, which I think is far too short. Harvard art history professor Jennifer L. Roberts requires her students to sit before a painting for three full hours, an exercise that she says is "explicitly designed to seem excessive" so that they might truly take the time to excavate the wealth of information proffered. Find a time somewhere in between seventeen seconds and three hours that feels comfortable but also allows you to really take in what you see.

To kick-start your observational skills, ask yourself the follow-

ing questions while you look at the painting: What do you think is going on in the painting? What relationships do you see—between people and objects? What questions does the painting elicit for you?

The point of this exercise is to get comfortable slowing down and truly studying works of art. With a quick glance we can see that there are two people in the painting, one standing and one sitting. It takes longer to discover details and realize relationships.

In the amount of time you looked at the painting, did you notice the orange sash in the seated woman's lap? That she was holding a quill pen in her right hand? That the blue tablecloth was bunched up on the far left of the scene?

Give yourself another full minute or two to really absorb details.

Did you look long enough? Perhaps, if you took note of the white ribbon tying the seated woman's pearls together at the nape of her neck or that writing covers the top half of the paper on the table. If you didn't, look longer.

Can you say with certainty from which direction the light is coming? If not, look again.

If you've seen that the light enters from the left as evidenced by the shadow across the seated woman's legs, you've most likely also observed the painting's primary colors—the yellow of the seated woman's fur-lined mantle, the bright blue of the standing woman's apron—but what about textures? Did you see the deep gathers at the top of the seated woman's left sleeve? The swooping amber folds in the background? The reflection of windows in the inkwell and glass?

Now that we've assessed the scene, what can we make of the information we have gathered? What relationships can we detect or dismiss? Is the standing woman a servant, friend, or mother? Her smooth complexion, similar to the seated woman's, suggests that they are close enough in age not to be mother and daughter. Analyzing the standing woman's plain, untrimmed clothing, lack of jewelry, and that her hair is pulled straight back from her face rather than curled in decoration further supports the notion that they are not in the same relational or social circle. If you look even more closely, you will see a line below the standing woman's right wrist that distinguishes her red working hands from the lighter skin of her more often protected forearm. Such a distinction is conspicuously absent on the seated woman's uniformly pale arm. From the former's posture and open mouth, it appears that she is delivering a letter to the seated woman, whose own gestures suggest that she is receiving rather than having just handed it over. Based on the facts presented, we can determine that the women are most likely not twins or sisters, mother and daughter, or strangers. Our best guess is servant and mistress, a supposition confirmed by the title of the painting: *Mistress and Maid.*

Studying this Vermeer painting shows us in practice that the lon-

ger and more attentively we look, the more we will discover. George de Mestral, Betsy Kaufman, Steve Jobs, and Leonardo da Vinci all believed that invention is less about creation than it is about discovery. And discovery is made possible by simply opening our eyes, turning on our brains, tuning in, and paying attention. Sir Isaac Newton agreed, stating, "If I have ever made any valuable discoveries, it has been owing more to patient attention than to any other talent."

We all have the talent to observe and make discoveries that will lead to greater things in any number of fields, but we must first be prepared to see.

When Derreck Kayongo returned from the concierge to his room with the knowledge that American hotels routinely discarded barely used bars of soap every day, he knelt down on his bed and cried. He had been the child who helped his father make soap, the child who lived in a squalid refugee camp without soap, and he was now living in a country where soap was simply thrown away. He didn't know what to do with that information but was determined not to let it go until he found a way to, as he says, "connect the dots." That connection came back to the bar of soap in his hotel shower, the bar he knew he could find a way to share with the world.

By preparing our minds to observe and absorb everything, and to discover the possibilities around and inside us, we open ourselves up to success in our own lives. We've already started by recognizing that observation is not just passively watching something but an actively engaging mental process. Before we can truly master it, though, we need to know our own blind spots.

we can reduce its effect simply by knowing that expecting a certain outcome predisposes us to look harder for evidence that supports that expectation. Confirmation bias is especially prevalent with data that give us a sense of self-verification or self-enhancement. To make sure you aren't mistaking your desires for facts, ask yourself two questions: "Is this information consistent with what I initially thought?" and "Does this information benefit me personally or professionally?" Your findings may still be factual even if you answer yes to either question, but by addressing your expectations up front, you can add more transparency to your information-gathering process.

Seeing What We're Told to See

Sometimes other people can add perceptual filters to our own observations. The integrity of our search for facts can be compromised when we look for what we think we need to find. If before I had shown you the photograph, I had told you that Jane Alexander's exhibit at Saint John the Divine was being censured for obscenity, you probably would have noticed the canine-human statues' nudity much more quickly than if I hadn't. If I had told you a story about a man who smuggled illegal jewels in his underwear before I showed you the photograph of Tony Matelli's sculpture, you would have focused on his attire and any bulges therein more readily than if I hadn't. Even if we don't realize it, we often see what we're told to see.

To offset this, pay special attention to any outside suggestions or restrictions that might be placed on your observation skills. I had a student at the University of Virginia School of Nursing come up to me following a presentation and confess that she found the common medical practice of "charting by exception" unduly constraining. Meant to streamline medical record keeping and make it easier to quickly review trends, charting by exception instructs personnel to document only unusual findings or exceptions to the norm. As a result, doctors and nurses are tempted to limit what they look for, especially if the chart is already filled with WDLs ("within defined limits") from previous shift workers.

Don't go right to the chart; go right to the patient. How does the patient look? What is the patient's reaction to *you?* Apply the

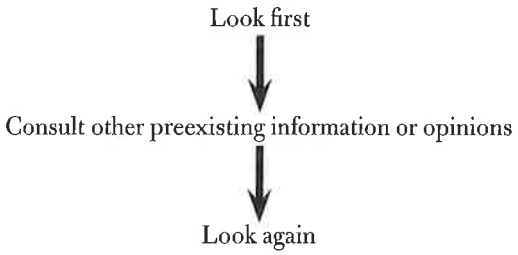
same principle to any form or evaluation or standardized report in any field. Be careful not to let it box you in. Your initial observation should be as unbiased and unlimited as possible. If a manager is fixated on following a form for evaluating an employee's punctuality or profitability, she might miss other telling benchmarks such as the employee's attire, demeanor, or body language. Look beyond the list. Focusing all of our attention on benchmarks and checking off boxes will inhibit a complete and accurate analysis from the start.

This is one reason why I don't allow participants in my class to read the labels next to works of art when we're in a museum and why I don't mention the name of the artist or work in this book right away: because labels shape opinions and create prejudice. If I had immediately told you that the black-and-white photograph on page 37 was called *Renshaw's Cow,* you would have missed the experience of looking at the image unfettered and the lesson you learned from the difficulty of identifying the cow. If you'd known Tony Matelli's sculpture was entitled *Sleepwalker,* you might have had trouble imagining the man as an active intruder or understanding how someone else might see him that way.

In a group of government agents I took to the Smithsonian American Art Museum, while standing beside a sculpture of smooth, round balls stacked in a pyramid and cracked half open with faces inside, one person reported seeing new life coming out of eggs, another saw death masks inside cannonballs, while someone else said the spheres reminded him of buckeye candy, spoonfuls of peanut butter half dipped in chocolate. Had they known ahead of time that the piece was titled *In Memoriam,* every observation would have been slanted in the direction of loss and war. Instead we got a more honest range of input and learned that the third observer hailed from Ohio and felt hungry. Is this sort of information relevant or useful? It certainly could be. It opened a door of personal experience in an otherwise impersonal setting, allowing this man's coworkers to view him in a way they never had before — as a small boy in his mother's midwestern kitchen.

To get a complete and accurate picture of anything, we need to aggregate all possible information and as many perspectives as possible so we can then sort through, prioritize, and make sense of it. La-

bels and prewritten accounts and existing information can then be included in our collection, but only after we have looked on our own first. So here's the order:



We're basically looking at things twice: first without any external influence, and then with a view informed by new data. You first experienced the photo at the beginning of this chapter for yourself, with no outside influence. Now that you have more information—that it's called *Renshaw's Cow*—go back to page 37 and look at it again. Does the name mean anything to you or sound familiar in any way? Renshaw is in fact the same Samuel Renshaw mentioned in the previous chapter, the vision expert whose system for recognizing aircraft at a glance was used to train 285,000 preflight cadets during World War II.

Renshaw used to spring the poorly developed bovine print on visitors to his Ohio State University lab and ask them to guess what it was. Nearly every adult got it wrong. One reporter investigating Renshaw's contribution to the war effort was confident it was a map of Europe, thus exposing his confirmation bias. In contrast, every small child Renshaw ever showed it to identified it immediately as a cow. Why? With fewer years of experience and a natural penchant for not listening, children don't have as many perceptive filters obstructing their view.

Not Seeing Change

The final entry in our triad of prevailing perceptual filters is change blindness, the failure to notice fluctuations in our visual field. Both

4

Delta Employees Do It on the Fly

The Who, What, When, and Where of Objective Surveillance

AS IT WAS MOST Saturday afternoons, the upscale mall was packed with shoppers. Students, mothers with their babies, businesspeople, couples, people of all ages and ethnicities strolled through the gleaming, five-story retail paradise. In the center of the mall, bright, auburn escalators crisscrossed the sunny, domed atrium where customers could sample yogurt, see a movie, or seek out the latest fashions. With a supermarket, bank, casino, cinema, and more than eighty stores in the 350,000-square-foot complex, there was a lot to see and do. Perhaps too much.

On September 21, 2013, four men walked toward the main pedestrian entrance of the mall and started throwing grenades. Once inside, they were joined by an indeterminate number of others and started firing automatic weapons at anyone and everyone. For four days the small terrorist group—perhaps as few as eight—held the Westgate Mall in Nairobi, Kenya, under siege, killing 68 people, injuring 175 more, and blowing up much of the building in the process.

How did a handful of people manage to keep hundreds of others captive inside a sprawling modern mall for so long? Because of a complete observation and communication breakdown among locals, visitors, shopkeepers, shoppers, and law enforcement agents.

After receiving texts from friends trapped inside the mall, local citizens arrived to help and found no SWAT team, no command center, and no coordinated government response. The mall security force had run away. The armed guards from the in-mall bank were cowering in a corner. Hours after the attack started, there was still no perimeter set up, causing many to suspect that some of the first assailants had simply walked away.

When police and soldiers did finally show up, they couldn't communicate with one another because their radios were set on different frequencies, they didn't have night vision goggles so they were limited in what they could do after dark, and no one could find a blueprint of the building. The only map they could produce was a printout from Westgate's own website—until that crashed as the rest of the world flooded it, looking for information.

Throughout the siege, one of the biggest challenges facing victims and authorities was that it was hard to tell who the good guys were. People with guns on the scene included not just the attackers but off-duty policemen, a local gun club, a neighborhood watch, a British Special Air Service officer, and regular armed civilians. And their uniforms were as varied as their languages. Midway through the attack, the terrorists changed clothes. When word got out that their captors were sparing Muslim hostages, shoppers began sharing *their* clothes to disguise their nationality. Outside, local Kenyan police mistook

one of their own undercover cops for an attacker and killed him. The deadly confusion delayed them from entering the building for days.

While the rescuers waited and argued among themselves, the terrorists restocked their weapon supply with ammunition previously stashed in the mall and spent four days hunting down, interrogating, torturing, and mutilating shoppers who had managed to find hiding places.

What if you were inside? What if your loved one was? The Westgate attack is an extreme case of public violence, but it is not as unusual as it might seem. From 2005 to 2012, there were sixteen mall shootings around the world, twelve of them in the United States; and in 2015, Somali terror group al-Shabaab urged followers to deploy an attack like the one in Kenya at the Mall of America in Minnesota.

Missing or mismanaging important data isn't just a matter of personal safety; it also affects our and our companies' professional reputations and profitability. A mishandled event from the mailroom to the boardroom can erode multiple facets of a company's value, from stock and financial to job and customer trust. In our current digital age, the news of company crises spreads internationally in an instant, and according to a global study done by Freshfields Bruckhaus Deringer, 53 percent of companies still don't see their share prices return to pre-crisis levels a year afterward.

While crises are crucibles that quickly bring organizational failings to light, they aren't the only situations where we need to accurately catalog and communicate what we see. We must be able to objectively survey the scene in which we find ourselves, sort fact from fiction, prioritize information, and disseminate it efficiently in all manner of instances—whether it's our life or our livelihood that hangs in the balance. Let's investigate how to do that step by step so we're better prepared.

FACT VERSUS FICTION

The perceptual filters we learned about in the last chapter can sometimes cause our brains to treat assumptions as facts. We'll practice sorting through the difference the same way we do throughout the book—by analyzing works of art. To start, take a look at these two paintings:

Each features a seated white woman with short hair and exposed legs looking down. Do the pictures look similar? They might because they were painted by the same artist, Edward Hopper. But be careful not to jump to any conclusions based on that information.

Take a look at these two women:

Is it the same woman? Indeed it is: Maud Dale, the wife of a wealthy patron of the arts who had two different artists paint her portrait. Is it the same artist? No. The one on the left was painted by

the French artist Fernand Léger, the one on the right by American George Bellows, sixteen years earlier.

To gather data successfully from what we observe, we cannot assume anything—including who someone is—based on a feeling, a look, or what we might have experienced in the past. Likewise, moving too quickly or too early in many situations—implementing a solution to a business problem, reprimanding an employee, or walking away from a relationship—without confirmation of the facts can be detrimental and in some situations fatal.

During the Westgate Mall siege in Nairobi, captive shoppers who incorrectly guessed the identity of the armed men they encountered paid dearly. Police, helpful citizens, and the attackers were all armed and dressed similarly, since terrorists often don official-looking uniforms, and many undercover officers were wearing casual clothes. Survivors who hid inside the Nakumatt supermarket recounted how after several hours a group of men with guns arrived at their location, proclaimed they were rescuers, and urged shoppers to come out of hiding. Those who did emerge, grateful, arms raised, were shot down by the untruthful terrorists.

Just because someone says something is a fact doesn't make it so. People lie, and as we've just learned, we can't even rely on our own eyes to always tell us the truth. To make sure a fact is a fact, you need to verify it every time.

I travel around the world by myself giving lectures, and I think I'm fairly good at protecting my personal safety, but apparently I'm not good enough, according to some law enforcement professionals. Once when I arrived at the train station in Harrisburg, Pennsylvania, to speak at an FBI training event, I received a text from the driver they had arranged for me that my ride would be waiting outside: a gray Toyota pickup truck. I easily found the vehicle, happily handed my luggage to the nice driver, and got inside. When the doors were closed and we started to pull away, the driver surprised me.

"I expected more from you," he said.

More from me? For what?

"You didn't ask me for identification," he continued. "I could have been anyone."

"But I got a text about the make and model of your car," I protested weakly.

"This unmarked gray truck?" he said. "How many other gray trucks were parked out there at the train station?"

I didn't know. "But you texted me," I began again.

"How do you know it was me?" he asked. "Your phone number is easier to find than you think. If someone wanted to kidnap you, you sure made it easy for them."

He was right, of course, and I learned my lesson. We need to be more watchful. We can't let our guard down, because criminals—or our competitors—won't.

We also must remember that appearances can be deceiving. Just because a man shows an outstretched hand and a ready smile doesn't make him a good guy, or the guy you were supposed to meet. Working with behavior-detection officers at the Transportation Security Administration (TSA), I've learned that a well-dressed man at the airport terminal may not be wealthy; he may instead be a drug smuggler disguised to dispel assumptions based on appearances. Likewise, the modestly dressed old woman may have tremendous wealth. The facts of an elderly woman's clothing might include "threadbare sweater, scuffed canvas shoes, small gold ring on left ring finger" but not "middle-class" or even "widow." The gold ring does not automatically indicate that its wearer is married.

JUST THE FACTS (MA'AM)

To find only the proven in the haystacks of information that often lie before us, we must set as our first goal in assessing a new scene or environment the collection of *all* the facts. By definition, a fact is "a truth known by actual experience or observation." Always use an open mind, and look past the obvious, but focus only on what you can observe to be true, not what you assume to be.

When looking at anything—a painting, a patient's room, our peers at a party, a public square, or a line of people at the airport—

we must study it using the same basic model of information gathering employed by journalists, law enforcement agents, and scientific researchers: who, what, when, and where. Who is involved in this scene? What happened? When did it happen? And where did the action take place? (The why will come later, in chapter 7, when we look at content.)

Let's begin by studying the Edward Hopper painting back on page 60 and seeing how many facts we can gather. Remember, we are using the piece not as an objet d'art but rather as a collection of data points. You may find the level of analysis of this Hopper painting on the following pages ridiculously detailed, but that's the point. Don't skim over any of it. Take your time and really absorb the process.

WHO?

Who is the subject of this scene? A lone woman. Are you sure? Look again. Is there anyone else in the room? In the reflection of the window? No, she appears to be alone.

What else do we know about the person? Is she married or single? We can't tell. Do we know her name? No. How can we definitively describe her? She appears to be white and in her twenties or thirties, although not too young to be alone. She doesn't have any wrinkles on her face, so that would put her age anywhere from late teens to early forties. We don't have an actual age as a fact, but we have eliminated other possibilities: she is not ten, nor is she sixty.

How about her height? Can you tell how tall she is? Yes, since according to the proportions in the room, she is sitting at what appears to be a regular-size table on a regular-size chair. We could do some calculations with a stand-in person seated at a standard-size table or even measure our woman in relation to the door handles on the left and come up with a fairly close approximation of her height.

What about her weight? She is wearing a bulky coat that hides her midsection, but we can see a slender neck, thin fingers, slim legs, and a rather flat chest. We can conclude that she is of average weight or slightly under but not overweight.

What is she wearing? A coat and a hat. Be more specific. If you had to describe her to someone else, differentiate her from another woman in a coat and hat, how would you do it? She's wearing a long-sleeved green coat trimmed with a brown fur collar and cuffs. The coat reaches her knees when she's sitting, which means that it's longer when she's standing up.

What else can we observe about her attire? She's wearing a yellow hat with a tiny cluster of artificial cherries on the right. The hat has a drooping brim that shadows her face. Knowing what kind of hat she chose to put on can tell us a lot about her. So what kind is it? Unless you're a milliner, which I'm not, we're going to have to look this one up. We can easily find out by researching it on the Internet, but we'll need a good, factual description of it to get good results. When I searched Google for "women's hats" I got sixty-nine million results. When I searched for "women's hat tight fitting turned down brim," the results narrowed to three million, and the first three sites listed all gave me the answer right away: it's a cloche. After another quick search I discovered that the cloche is a fitted, bell-shaped hat invented in 1908 that was very popular in the 1920s.

We cannot see her shoes, but did you notice she's only wearing one glove? Where's the other one? We can't see it. At this point, you might be saying, "So what? Who cares?" But the secrets of life are often revealed through small details. Small details can solve crimes. Small details can lead to significant diagnoses. Small details reveal big things.

That she's only wearing one glove, on her left hand, is important to note. It might be the most important fact, especially if the right-hand glove turns up somewhere. The discovery of a single glove at the crime scene became the crux of the O. J. Simpson murder trial.

That our subject is wearing only one glove might indicate her state of mind. Is she distracted? In a hurry? That she's sitting with a cup and saucer in front of an empty plate would suggest

that she's been sitting at this table for some time. Is she wearing the glove to conceal something on her left hand? A deformity? A stain? A wedding ring? We don't have the answers to those questions, but cataloging the facts will get us to ask the right questions.

What about jewelry? Is that a red earring on her left ear, or a curl of her hair? It looks like it could be an earring, but if we study where her ear should be in relation to the bottom of her nose, the red circle proves to be too high for an earring.

There is a glint on her right ring finger that could be a ring, or perhaps her fourth and fifth fingers are just slightly apart, allowing the white table to peek through. A closer examination of the placement of her hand reveals that if her fingers were separated, the dark brown cuff of her coat, and not the tabletop, would show through at that particular spot.

We can't tell if she's wearing any bracelets, but she doesn't appear to be wearing a necklace.

What about her body language? Her lips are pursed, and she's not engaged with anyone. She's still wearing her coat. And she's looking down into the cup she holds in her right, ungloved hand.

What's in the cup? Coffee? How can you be sure? The presence of a cup instead of a glass suggests a hot drink, not cold. The most likely choices of hot drink are coffee, tea, and hot chocolate. There's no discernible whipped topping or brown residue that typically comes from drinking hot chocolate. There's no tea bag or spoon that would typically accompany hot tea. So coffee is a good guess but not a fact.

Employing a similar investigative method of objectively assessing a person's attire, behavior, and interactions with objects can help us uncover the identity or intentions of unknown people in any situation, from a traveler in the airport who might be a potential terrorist to a driver waiting curbside who might be a potential kidnapper. Noting whether people's shoes matched their official uniforms, what kind of guns they were carrying, and how they walked might have told those hidden inside the Kenyan mall volumes about who might rescue them and who might murder them.

WHAT?

The second question in our investigative model is *what* happened or what's happening. What is the main action? In the Hopper painting there's not much action: a single woman sitting at a table holding a cup. There's no one else in the picture, or even a hint of another person. The woman is looking down, her mouth closed. There is an empty plate in front of her, aside from the cup and saucer, that indicates she's been at the table long enough to finish eating something.

Such simplicity is not always the case, however. Many paintings, like many scenes in life, are complex. Let's take a closer look at a painting we passed by in chapter 1 on page 10. What's going on here?

Jan Steen, *As the Old Sing, So Pipe the Young*, 1668–1670.

Three women and a bearded man are seated around a small food-laden table; one of the women holds a paper, one holds a baby, and the other a drinking glass in her outstretched hand. A man with long

hair stands over the table pouring liquid into the seated woman's glass. Another man, possibly seated, possibly just short in stature, is to his immediate left holding a long pipe to a young boy's mouth. Another boy looks on. Behind him, against the wall, a man holding an instrument resembling a bagpipe, reed in his mouth, looks directly at the viewer—the only person in the painting to do so. The group is surrounded by animals. A tropical bird with long tail feathers, possibly a parrot, gazes down at them from a tall perch in the corner of the room next to two smaller birds in a cage mounted high on the wall. A spotted dog, nose and tail up, looks out of the frame at something we cannot see.

What is the group doing? We cannot conclude definitely, but we can gather facts that will help eliminate incorrect assumptions. Are they eating dinner? Not likely, since the table they sit around is small and doesn't contain place settings. Most people in the painting are smiling, some have no expression, and the piper might be pensive, but there seems to be an absence of tension or conflict. Are those in the group related to one another? We have no facts that prove either for or against, so we cannot assume. They could be neighbors or guests at an inn.

We might not have a full picture of what is going on, but we have discovered many facts that can point us toward what is and is not happening. The group has food and drink, music and companionship. They are fully dressed and seated on and around carved furniture. Children are present. The animals pictured are calm. From this we can tell what is not happening. There is not a storm raging outside. The people are not starving. Aside from the possibly pensive pipe player, the body language of the group is relaxed and suggests they all know one another.

Taking the time to analyze what is happening matters. In the firestorm of the Nairobi mall, many people failed to realize what was going on in their immediate surroundings, and suffered for it. Some shoppers first thought the gunshots were a gas heater exploding or a bank robbery. Those who fled without first assessing what was happening ran right into the gunmen's line of fire. Those who waited, evaluated, and figured out that it was a terrorist attack found safe hiding places. Even though it may seem obvious and not worth investigating, especially when things are calm, resist the urge to rush past the *what,* or you'll leave behind valuable facts you might not otherwise have recovered.

WHEN?

Now let's investigate *when* the action is taking place. What facts can we find about when this scene in the Hopper painting back on page 63 occurred?

What time of year is it? The woman's fur-trimmed clothes would usually put us in late autumn or winter, yet her yellow, cherry-adorned hat doesn't seem to match those seasons. Could it be early spring and unseasonably cold? In either case, we might eliminate the dead of winter, as her hat seems a bit flimsy, and the height of summer, as her coat seems too substantial for warm weather.

What time of day is it? It is after dark, but when? Since days are shorter in the early spring and late fall, it could be fully dark by 5 p.m. in many places, and stay dark until 7 a.m., so we have a fourteen-hour window. We can shorten that time span, though, by noting that the scene outside the window lacks any artificial light as well. The bright, clean interior suggests that the location might not be in a dicey or isolated part of town, so there should be other activity outside the window: streetlights or car headlights. That there isn't suggests either an odd, late hour, when most people are not out and about, or simply an aesthetic choice to create a mood of isolation and solitude. Either should be taken into account as observations.

What about the year or time period? Researching the woman's hat put us in the 1920s. Further research on the evolution of the cloche shows that by 1928 the brims were either gone or upturned, so we are most likely before that year, since our subject's hat has a downturned brim.

WHERE?

Finally, we need to assess *where*. Where is the scene from the Hopper painting taking place? Without a logo on the window or a written word anywhere, we must do a little more in the way of observation.

Based on the walls, doors, windows, and electric lights, we can see that the scene is indoors. The place is clean, well kept, and well lit. The golden radiator and door handles don't show any signs of scuff or wear.

We can see one white-topped, round table with two dark brown chairs. In the lower right corner is the back of another chair that suggests there is at least one more set of table and chairs. Did you miss that chair corner? Is it important?

Noting the facts of your location—what's around you or the subject of any scene you are studying—can be critical or even life-saving if something unexpected happens. Knowing where the emergency exits are in a darkened theater, which are the exit rows on a plane, or where the storm shelter or strongest doorway is in the event of a natural disaster can make all the difference. Situational awareness is imperative for decision making in many situations from air traffic control and emergency services to driving a car or maneuvering a bicycle along a busy street.

As I've mentioned, I travel frequently for my job and often find myself alone in hotel rooms—a possibly unsafe situation for anyone, since hotels can be cavernous, convoluted spaces with a crowded, transient clientele conditioned to ignore the noises in adjoining rooms. Therefore, I will not take a room on the first floor, as those are too easily accessed from the outside. In case there is an unexpected emergency, I take time to locate the nearest elevator and stairs. Carefully noting where I am, who is around me, and the nearest means of egress is critical for my personal safety, and an assessment I make before I enter an elevator or a stairwell or get on a subway or bus.

Westgate Mall survivor Elaine Dang did the same thing, and it saved her life. The twenty-six-year-old from San Diego who works in Kenya was attending a children's cooking competition when the first grenades exploded. She told CNN that one of the contest presenters told everyone to run to the parking lot. She followed at first but then changed her mind, deciding that the crowd was vulnerable. She instead turned back to the competition area knowing there was a large, silver kitchen counter she could hide behind. She did, and she lived. Many others ran blindly toward the parking lot and did not.

Let's go back and look more closely at the location in the Hopper painting to see what else we can discover. On the table is an empty plate, and the woman holds a cup that has its own saucer. What kind of place would serve a hot drink and food, and have multiple tables and chairs? A restaurant, diner, or coffee shop? There is also nothing else on the table that you would typically see in a restaurant or diner; there are no napkins, no condiments, no salt and pepper, no menu. We cannot see a hostess stand or welcome sign or cashier.

What can we see? On the windowsill behind the woman is another nod to food: a bowl of shiny red, orange, and yellow fruit. On the right side we can see the top of a rail for a staircase that leads down. The front of the establishment is dominated by a large window. All we can see in it is two rows of electric lights stretching back into the building.

So what location in the mid-1920s would be clean, well kept, offer food and drink, be open at night, and be safe for a woman by herself? With that information, you could search the Internet and find the answer: an Automat. Automats were "restaurants" without waiters. Self-service vending machines lined the walls; patrons could choose whatever food they wanted for a combination of nickels. Horn & Hardart opened the first Automat in 1902; at one point it was the world's largest restaurant chain, serving 800,000 people a day. Automats typically had round tables with white Carrara glass tops, as we see in the Hopper painting. And they were well known for the best coffee in town.

GETTING THE ANSWERS

Since we're using works of art to hone our observational skills, knowing anything about the background of this painting, the style in which it was painted, or the painter is neither essential nor required. However, since we do have some information about the painting, we can use it to confirm our success or failure as observers.

The title of this piece is *Automat,* and it was first exhibited in 1927. The woman in the painting is modeled after Hopper's wife when she was younger, but we do not know who she is meant to be, where she came from or is going, or how she feels. We will never have all of the answers—not many people do—but the more observant we can be, the more facts we can collect, catalog, and process, the more we will know.

If more people in the Kenyan Westgate Mall had observed and organized what facts they knew and didn't know, more of them might have been saved. For instance, people hiding in the back room of the mobile phone store Safaricom heard noises in the air vents and considered climbing into them to escape when they realized they didn't know if the noises were from other hostages or from wandering terrorists. Without the facts, they stayed put, and lived.

When an injured Kenyan was being evacuated with other shoppers, someone noticed a machine gun magazine falling out of his pocket. If they hadn't, would this terrorist have gone free? Instead, he was detained.

How many details weren't noticed or reported by anyone for the months leading up to the attack? The BBC reported that the terrorists had been renting a store inside the Westgate Mall for months, smuggling and storing a massive stockpile of weapons. How did their activities and the transfer of arms go unnoticed? The same way we all miss pertinent facts when we're busy or distracted or just not looking. A week after the Kenyan mall attack, riders on a crowded San Francisco commuter train failed to see Nikhom Thephakaysone raise a .45-caliber pistol several times, wipe his nose with it, and aim it at the young student across the aisle from him. According to the *San Francisco Chronicle,* dozens of passengers were standing and sitting just a few feet away, "their eyes focused on smartphones and tablets," and didn't lift their eyes until twenty-year-old Justin Valdez was shot dead.

Good objective observation skills aren't necessary only in life-threatening instances; they're imperative for so many facets of our personal and professional lives. I regularly teach people who interact with children as part of their jobs—medical personnel, educators, family service investigators—who remind me of the gravity of reporting objectively. One woman, a caseworker from Maryland, showed me the importance of bruises.

There is a significant difference between reporting that a child is "covered in bruises" and "has three dime-size, round, yellow and purple bruises just under the kneecap, one on the left leg and two on the right." The latter could probably be said for the majority of active kids because of how often they bang their shins. Other places, such as the face, head, neck, and buttocks, are not normal bruising sites. The color and shape of bruises can be just as telling as their location. Round bruises typically result from bumping into something. Long, rectangular, or hand-shaped bruises do not. Bruises may have red in them until they are fully healed, but yellow bruises typically indicate that at least eighteen hours have passed since the initial impact. And since bruises fade, it's crucial to describe them in clear, objective detail as soon as you observe them.

The importance of objective description applies equally to seemingly inconsequential things in life such as a cappuccino order. Getting it right requires an accurate and descriptive order that starts with the customer, continues with the cashier, and ends with the barista. Any laziness in observation or communication can cost time, money, and frustration for all parties. Is a botched cup of coffee really a big deal? It is if you can't face the day without your morning cup, or if you're in the business of selling coffee. Small errors add up. If just one incorrectly prepared drink a day is thrown away in each of its twenty thousand stores, Starbucks loses about $8.5 million a year; two faulty orders doubles that to over $17 million—all preventable loss.

Occasionally a skeptical participant in my class will protest that

cataloging facts in a painting is nothing like her daily job. I disagree. Almost every job, especially those on the "front lines" of a business, such as doormen, greeters, receptionists, and executive assistants, requires objective surveillance. We're just not always aware of how much we or those around us are doing it. Take a flight attendant. Not only are flight attendants ambassadors for the airline, hosts and waiters, safety experts, administrative and inventory specialists, schedulers, porters, and sometime concierges, they are also emergency services coordinators and, in essence, first responders. Even during the seemingly mundane ritual of greeting and seating passengers, the cabin crew are also on the lookout for what the International Civil Aviation Organization calls ABPs, or "able-bodied passengers"—people they can count on to assist in an emergency. There must be three ABPs per exit. The size and shape, age, and seat location of ABPs changes on every flight. There is no sign-up list or predetermined ABP indicator. As new passengers board, the flight attendants must quickly find them through astute and discreet assessment; most ABPs don't even know they've been mentally marked.

An ABP must be over fifteen years of age; have sufficient mobility, strength, and dexterity in both arms, hands, and legs; be able to read, understand, and communicate in English; not require a seat belt extension; and not be traveling with anyone else, since people are more likely to help their family members before assisting strangers. Flight attendants are trained to not only spot ABPs with the correct physical, cognitive, and mental abilities, they need to identify passengers who can understand and take direction while remaining calm under pressure.

All of this is determined through objective observation. Serving thousands of people a year, flight attendants know better than most that you can't assume anything from appearance. Just because someone looks a certain way doesn't mean he doesn't speak English or have a strong stomach or isn't related to the pretty girl he's splitting his snack with. The flight attendants must reach their conclusions by looking, listening, and piecing together the clues they're presented. The six-foot-plus guy who asked the flight attendant about turbulence? He's out. The woman who shuffles in with a cane? No. The gentleman who graciously helps the person in front of him store her bag overhead? A good candidate.

When we are fact gathering, we must be careful that our observations are objective, though, and not subjective. The distinction can be small, but it's critically important; it's literally the difference between fact and fiction. An objective observation is based on empirical or mathematical facts. A subjective observation is based on assumptions, opinions, feelings, or values. *The bruise is nasty* is subjective; *the bruise is round, approximately one inch in diameter, and purple* is objective.

HOW TO AVOID THE SUBJECTIVE

One way to ensure that our observations remain objective is to quantify them by counting, estimating, or using measuring tools. "Small" might mean different things to different people: a ladybug is small compared with a dog, but a dog is small compared with an elephant. Adding numbers will help remove interpretation and doubt. "Small" is subjective; "one inch across" is not. Measure whenever you can, estimate when you can't, but always use numerical values. Instead of saying there are "many" lights on the ceiling above the woman in Edward Hopper's *Automat,* note that there are "two rows of seven lights." Rather than stating that "there are a few chairs" in the scene, be specific: "there are three dark, wooden, armless chairs visible."

Even phenomena that can't be counted or measured can be quantified. Instead of saying that the dog is "smelly," quantify it: "On a scale of one to five, five being the worst, the smell emanating from the dog was a four."

Finally, replace descriptive adjectives with comparative nouns. "Smelly" is subjective. So is "smells bad." What smells bad to some—cut grass, gasoline—smells wonderful to others. Instead, find a concrete noun to compare with the smell you're describing: "The dog smelled like dead fish."

Striving for the objective doesn't end with observation, however; we must ensure that when we draw conclusions, we are also

using only facts, not opinions. Suppose you hadn't seen the Hopper painting at all but were presented with two different summaries of it. Which one is objective and which one is subjective?

- A forlorn woman sits alone in a coffee shop at a round, white, marble table.
- A woman with a closed mouth and downcast eyes holds a cup and saucer while sitting alone at a round, white-topped table.

Both describe the scene, both convey that the woman is not dancing and laughing but sitting quietly, looking down. However, the first sentence reaches the conclusion that the woman is forlorn, an adjective that means lonely or sad. This is a subjective interpretation of the woman's expression, not a statement of fact. The second sentence describes the woman's face and countenance based on objective facts — she's looking down, her mouth is closed — without adding any assumptions about her mood.

The first sentence also concludes that the woman is sitting in a coffee shop. The second instead factually states that the woman is holding a cup, without guessing what type of place she is in or what — if anything — is in her cup. What's the big deal with "coffee shop" versus "holds a cup and saucer"? A lot. Where she is hasn't been proven or disproven. To state something as important as location as a fact, even casually, especially to someone unfamiliar with the scene or someone down the chain of information, can lead to more untrue assumptions that turn into "facts."

For instance, location was at the crux of the argument against Matelli's *Sleepwalker* statue, as some of the protesters asserted that by installing it at an all-women's college the school's administration was neglecting to provide a "safe" environment for its students — a serious allegation. The debate was not over "a schlumpy guy in underpants," as a Wellesley College English professor described him, but over where he was: a school with an all-female student body. By subjectively reporting the statue as being in a "prominent" place on campus, the *Boston Globe* ignited a controversy rather than objective examination. "Prominent" is subjective; it is an opinion of importance. Yet citing that as the statue's location without any factual or logistical information fanned the flames of reports that students were "freaked out" by it or could not avoid it.

If you were a reporter, a parent of a Wellesley student, or a member of the board of trustees, it would be in your best interest to gather all of the facts regarding the statue's placement. And a "prominent" place is not a complete, factual location assessment. The statue was not placed thoughtlessly; it was set right across from the on-campus Davis Museum, specifically situated so that it could be seen from the windows on the first and fifth floor that contained *the rest of Matelli's exhibit,* which included other realistic human sculptures. As Davis Museum director Lisa Fischman explained, *Sleepwalker* was put there to "connect the exhibition — within the museum — to the campus world beyond"; she saw it as "art escaping the museum." School officials also noted that the work was not put in an area that might invade personal privacy such as outside a dormitory; indeed, it was purposefully put on a grass enclosure that contained no sidewalks so students would not be forced to interact with it.

Unearthing all objective observations about the location of *Sleepwalker* is critical to determining whether Wellesley meant to confront or assault its students with art. Similarly, we have a responsibility to glean as many objective observations as possible — not stopping at a first look, cursory glance, or checked-off box — so that we are sure conclusions reached are based on facts and not assumptions.

THE RISK OF ASSUMPTIONS

While researching this book, I was reading with my son and came across a wonderful description of the downsides of assumptions in *The Austere Academy* by Lemony Snicket:

> Assumptions are dangerous things to make, and like all dangerous things to make — bombs, for instance, or strawberry shortcake — if you make even the tiniest mistake you can find yourself in terrible trouble. Making assumptions simply means believing