VISUAL INTELLIGENCE

Sharpen Your Perception, Change Your Life

AMY E. HERMAN

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Author's Note

It has been my great privilege to teach The Art of Perception for fourteen years. In doing so, I have spoken with and written to thousands of people from around the world about their experiences with art, observation, perception, and communication. Since some of these conversations took place years before this book was even an idea, since my wonderful program participants didn't plan on being part of this book when they signed up for my class, and since many of my interviewees have extremely sensitive jobs, I have changed the names and identifying details of most of the people whose stories appear in this book to protect their privacy. Any resulting resemblances to persons living or dead are entirely coincidental and unintentional. *Visual Intelligence* is a work of nonfiction. All stories are recounted as they happened or were told to me, subject to the limitations of memory. I couldn't fact-check all of the personal stories people told me, but I included only those I believed to be true.

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

. . .

Assess

We find only the world we look for.

— HENRY DAVID THOREAU

1

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 reception-

ist 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.

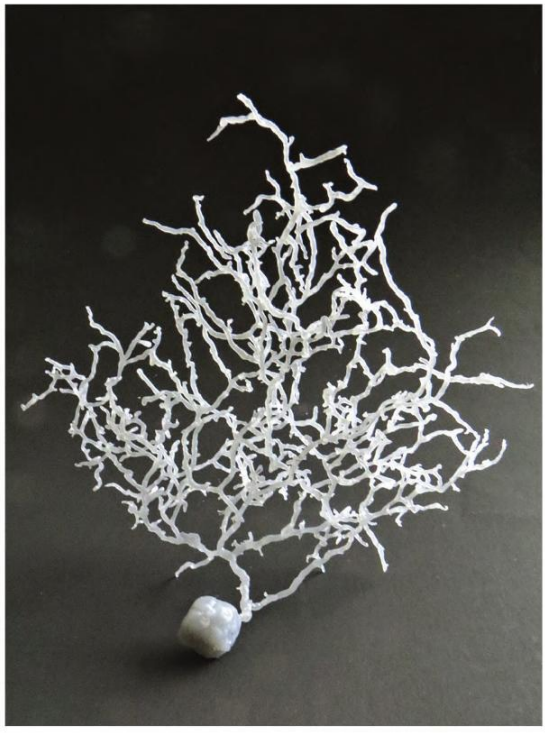
While our sense of sight is most often associated with the spherical organs that occupy the orbits of the skull, the brain is really the workhorse of the visual processing system. Not only does processing what we see engage a full 25 percent of our brain and over 65 percent of all our brain pathways — 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 ret-

ina 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.

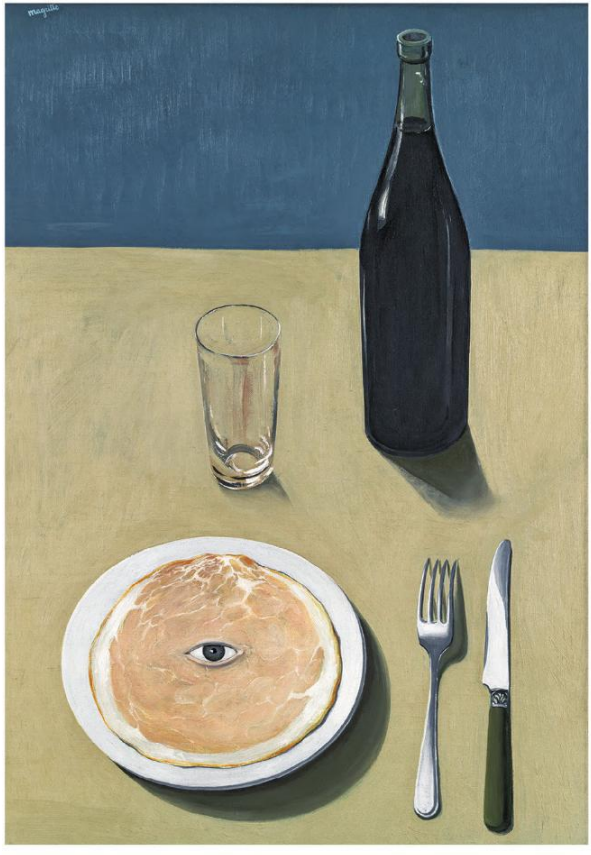
When Derreck Kayongo returned from the concierge to his room with the knowledge that American hotels routinely discarded barely used bars of soap every day, he knelt down on his bed and cried. He had been the child who helped his father make soap, the child who lived in a squalid refugee camp without 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.

2

Elementary Skills

Mastering the Fine Art of Observation



René Magritte, *The Portrait*, 1935.

IN 1877, AN EIGHTEEN-YEAR-OLD student slid into one of the two hundred seats arranged in a steep semicircle in the dark wood-paneled Anatomy Lecture Theatre, a new state-of-the-art classroom at the University of Edinburgh's Medical School. The occupants of the room tittered with anticipation for the arrival of the appointed speaker, a local legend as well known for his deep knowledge of a wide range of subjects as for his dynamic delivery of it. He was going to teach the young students what he called "the Method," a disciplined approach to diagnosis that relied on keen observation skills above all.

With a flourish, the man — tall and lean with an aquiline nose and piercing eyes — bounded into the lecture hall, tore off his cloaked coat and deerstalker cap, and called for the first subject to be sent in. A line of outpatients the man had never set eyes on before waited in the hallway to be presented live to his pupils.

An elderly woman dressed in black entered.

"Where is your cutty pipe?" he inquired.

The woman started. How could he know she had one? Shocked, she pulled a small clay pipe from her purse.

"I knew she had a cutty pipe not because I saw it, but because I observed her," he told his rapt audience. "I noted the small ulcer on her lower lip and glossy scar on her cheek, sure signs of habitual use of a short-stemmed pipe that lay close to the cheek when smoking."

Another patient limped in. The teacher called on one of his students.

"What is the matter with this man, sir?" he asked. "Come down, sir, and look at him! No! You mustn't touch him. Use your eyes, sir! Use your ears, use your brain, your bump of perception, and use your powers of deduction."

The nervous student answered with a guess he hoped seemed confident: "Hip-joint disease, sir!"

"Hip-nothing!" the instructor cried out. Without a backward glance, he announced, "The man's limp is not from his hip, but from his foot, or rather from his feet. Were you to observe closely, you would see that there are slits, cut by a knife, in those parts of the shoes where the pressure of the shoe is greatest against the foot. The man is a sufferer from corns, gentlemen, and has no hip trouble at all."

The speaker continued to divine with ever-increasing alacrity the profession, off-duty vices, and world travels of people whom he had never met.

"Gentlemen, we have here a man who is either a cork-cutter or a slater. If you will only use your eyes a moment you will be able to define a slight hardening—a regular callous, gentlemen—on one side of his forefinger, and a thickening on the outside of his thumb, a sure sign that he follows the one occupation or the other. The shade of tan on his face shows him to be a coast-sailor, and not a deep-sea sailor—a sailor who makes foreign lands. His tan is that produced by one climate, a 'local tan,' so to speak."

When another student got a diagnosis incorrect, the teacher admonished, "The gentleman has ears and he hears not, eyes and he sees not!" In his view nothing was more important to discovery—in medicine, criminal law, or life in general—than finely tuned observation skills. He let no fact, however small, escape his notice, frequently pointing out what others had failed to observe: tattoos, accents, skin marking, scars, clothing, even the color of soil on someone's shoes.

"Glance at a man and you find his nationality written on his face," he instructed, "his means of livelihood on his hands and the rest of his story in his gait, mannerisms, watch-chain ornaments and the lint adhering to his clothes."

If the speaker's sharp senses and rapid-fire delivery of his deductions sound like Sherlock Holmes, it is for good reason: he was the real-life inspiration for the fictional detective. Dr. Joseph Bell, a professor of surgery, prolific writer, and a relative of Alexander Graham Bell, enthralled his young student Arthur Conan Doyle with his uncanny and uncommon yet in his words "elementary" talents. According to Bell, who often chanted, "Use your eyes, use your eyes" in his classes, the most important skill was a simple differentiation between passive sight and active assessment.

Bell's Sherlockian summation: "Most people see but do not observe."

What's the difference? Doyle had Sherlock Holmes himself explain it in one of his first published short stories, "A Scandal in Bohemia," when Dr. Watson claimed to have eyes just as good as Holmes's.

Holmes countered, "You see, but you do not observe. The distinction is clear. For example, you have frequently seen the steps which lead up from the hall to this room."

"Frequently."

"How often?"

"Well, some hundreds of times."

"Then how many are there?"

"How many? I don't know."

"Quite so! You have not observed. And yet you have seen. That is just my point. Now, I know that there are seventeen steps, because I have both seen and observed."

Although we frequently use the terms interchangeably, seeing can be thought of as the automatic, involuntary recording of images. Observing is seeing, but consciously, carefully, and thoughtfully.

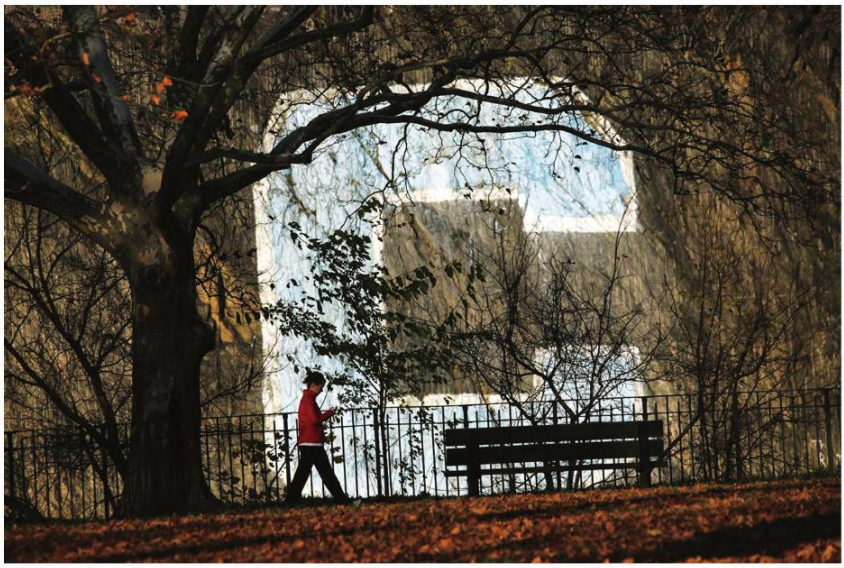
WHAT DO YOU SEE?

To help everyone take a personal inventory during every Art of Perception class, I show the photograph opposite of a young woman walking outdoors and ask the simple question: what do you see? In just one sentence, tell me what you see.

Go ahead and test yourself right now. What single sentence would you use to completely and accurately describe this scene?

I've been doing this for over a decade now with professionals from every walk of life. People tell me about the young woman; the most astute note what she's wearing, where she's looking, that she appears to be holding something, and which leg she is leading with. People tell me about the large tree on the left and its lack of leaves; some go so far as to estimate its height based on the comparison of the woman, but true to Holmes's assertion, no one ever tells me the number of branches. I hear about the bushes along the fence and the fence itself, the bench, the fallen leaves and shadows in the foreground. But perhaps most shockingly, about half of the people who view this photograph don't mention the giant letter *C* in the background.

Do you see it? Did you see it originally? Did you include it in your



descriptive sentence? It's not an illusion or a postprocessing photography trick. The *C* really exists. Is it an important part of the photograph? Is it worth mentioning? It is, for many reasons. It places the photograph in a unique location, as a bit of research would uncover that the *C* is painted on a one-hundred-foot-high rock wall on the Bronx side of the Harlem River in New York City across from Columbia University. It helps establish the time frame in which the photograph was taken, since the *C* first appeared in all white in 1955 and was repainted to feature pale blue outlined in white in 1986. And since the *C* is an impressive 60 feet tall by 60 feet wide—possibly New York City's largest graffiti—noticing such a sizable object that takes up much of the photograph is a testament to elementary observation skills.

Those who fail to see this *C* are normal people with normal vision who just haven't sharpened their observation skills. What if the 50 percent who didn't see it included the detective assigned to your robbery, or your surgeon, your boss, your boyfriend, or your child's bus driver? What if you didn't see the *C*? Missing such a large detail might not seem critical right now while you're reading a book, but what about when you're babysitting, behind the wheel, or just crossing the street?

Before we can really hone our observation skills, however, we