Smarter, Faster, Better

Charles Duhigg—2016.

INTRODUCTION

- Productivity, put simply, is the name we give our attempts to figure out the best uses of our energy, intellect, and time as we try to seize the most meaningful rewards with the least wasted effort.
- One chapter, for example, examines how a feeling of control can generate motivation, and how the military turns directionless teenagers into marines by teaching them choices that are "biased toward action."
- Connecting these eight ideas is a powerful underlying principle: Productivity isn't about working more or sweating harder. It's not simply a product of spending longer hours at your desk or making bigger sacrifices. Rather, productivity is about making certain choices in certain ways. The way we choose to see ourselves and frame daily decisions; the stories we tell ourselves, and the easy goals we ignore; the sense of community we build among teammates; the creative cultures we establish as leaders: These are the things that separate the merely busy from the genuinely productive.

1: MOTIVATION

- Scientists have found that people can get better at self-motivation if they practice the right way. The trick, researchers say, is realizing that a prerequisite to motivation is believing we have authority over our actions and surroundings. To motivate ourselves, we must feel like we are in control.
- When people believe they are in control, they tend to work harder and push themselves more. They are, on average, more confider believe they have authority over themselves often live longer than their peers. This instinct for control is so central to how our brains develop that infants, once they learn to feed themselves, will resist adults' attempts at control food into their mouths.
- From these insights, a theory of motivation has emerged: The first step in creating drive is giving people opportunities to make choices that provide them with a sense of autonomy and self-determination. In experiments, people are more motivated to complete difficult tasks when those chores are presented as decisions rather than commands. That's one of the reasons why your cable company asks all those questions when you sign up for service. If they ask if you prefer a paperless bill to an itemized statement, or the ultra package versus the platinum lineup, or HBO to Showtime, you're more likely to be motivated to pay the bill each month. As long as we feel a sense of control, we're more willing to play along.
- "You know when you're stuck in traffic on the freeway and you see an exit approaching, and you want to take it even though you know it'll probably take longer to get home?" said Delgado. "That's our brains getting excited by the possibility of taking control. You won't get home any faster, but it feels better because you feel like you're in charge.'
- This is a useful lesson for anyone hoping to motivate themselves or others, because it suggests an easy method for triggering the will to act: Find a choice, almost any choice that allows you to exert control. If you are struggling to answer a tedious stream of emails, decide to reply to one

from the middle of your inbox. If you're trying to start an assignment, write the conclusion first, or start by making the graphics, or do whatever's most interesting to you. To find the motivation to confront an unpleasant employee, choose where the meeting is going to occur. To start the next sales call, decide what question you'll ask first.

- Motivation is triggered by making choices that demonstrate to ourselves that we are in control. The specific choice we make matters less than the assertion of control.

- Krulak began reviewing studies on how to teach self-motivation, and became particularly intrigued by research, conducted by the Corps years earlier, showing that the most successful marines were those with a strong "internal locus of control"—a belief they could influence their destiny through the choices they made.

- Locus of control has been a major topic of study within psychology since the 1950s. Researchers have found that people with an internal locus of control tend to praise or blame themselves for success or failure, rather than assigning responsibility to things outside their influence.

- A student with a strong internal locus of control, for instance, will attribute good grades to hard work, rather than natural smarts. A salesman with an internal locus of control will blame a lost sale on his own lack of hustle, rather than bad fortune.

- In contrast, having an external locus of control—believing that your life is primarily influenced by events outside your control—"is correlated with higher levels of stress, [often] because an individual perceives the situation as beyond his or her coping abilities," the team of psychologists wrote.

- Studies show that someone's locus of control can be influenced through training and feedback. One experiment conducted in 1998, for example, presented 128 fifth graders with a series of difficult puzzles. Afterward, each student was told they had scored very well. Half of them were also told, "You must have worked hard at these problems." Telling fifth graders they have worked hard has been shown to activate their internal locus of control because hard work is something we decide to do. Complimenting students for hard work reinforces their belief that they have control over themselves and their surroundings.

- "We never tell anyone they're a natural-born leader. 'Natural born means it's outside your control," Krulak said. "Instead, we teach them that leadership is learned, it's the product of effort. We push recruits to experience that thrill of taking control, of feeling the rush of being in charge. Once we get them addicted to that, they're hooked."

- In his fourth week of training, for instance, Quintanilla's platoon was told to clean the mess hall. The recruits had no idea how. They didn't know where the cleaning supplies were located or how the industrial dishwasher worked. Lunch had just ended and they weren't sure if they were supposed to wrap the leftovers or throw them away. Whenever someone approached a drill instructor for advice, all he received was a scowl. So the platoon began making choices. The potato salad got tossed, the leftover hamburgers went into the fridge. And the dishwasher was loaded with so much detergent that suds soon covered the floor. It took three and a half hours, including the time spent mopping up the bubbles, for the platoon to finish cleaning the mess hall. They mistakenly threw away edible food, accidentally turned off the ice cream freezer, and somehow managed to misplace two dozen forks. When they were done, however, their drill instructor approached the smallest, shyest member of the platoon and said he had noticed how the recruit had asserted himself when a decision was needed on where to put the ketchup. In truth. It

was pretty obvious where the ketchup should have gone. There was a huge set of shelves containing nothing but ketchup bottles. But the shy recruit beamed as he was praised.

- "I hand out a number of compliments, and all of them are designed to be unexpected," said Sergeant Dennis Joy, a thoroughly intimidating drill instructor who showed me around the Recruit depot one day. . "You'll never get rewarded for doing what's easy for you. If you're an athlete, I'll never compliment you on a good run. Only the small guy gets congratulated for running fast. Only the shy guy gets recognized for stepping into a leadership role. We praise People for doing things that are hard. That's how they learn to believe they can do them."

- "Technically, we could send them back to start over because each person didn't hear a direct verbal command from the team leader," a drill sergeant later told me. "But that's the point of the exercise: We know you can't hear anything with the gas masks on. The only way to get across the pit is to figure out some workaround. We're trying to teach them that you can't just obey orders. You have to take control and figure things out for yourself."

- "Why are you doing this?" Quintanilla's pack buddy wheezed at him, lapsing into a call-and-response they had practiced on hikes. When things are at their most miserable, their drill instructors had said, they should ask each other questions that begin with "why."

- "To become a Marine and build a better life for my family," Quintanilla said. His wife had given birth a week earlier to a daughter, Zoey. He had been allowed to speak to her for a total of five minutes by telephone after the delivery. It was his only contact with the outside world in almost two months. If he finished the Crucible, he would see his wife and new child. If you can link something hard to a choice you care about, it makes the task easier, Quintanilla's drill instructors had told him. That's why they asked each other Questions starting with "why." Make a chore into a meaningful decision, and self-motivation will emerge.

- "You think boot camp is going to be all screaming and fighting," Quintanilla told me. "But it's not. It's not like that at all. It's more about learning how to make yourself do things you thought you couldn't do. It's really emotional, actually." (TAP)

- Moreover, to teach ourselves to self-motivate more easily, we need to learn to see our choices not just as expressions of control but also as affirmations of our values and goals. That's the reason recruits ask each other "why"—because it shows them how to link small tasks to larger aspirations.

- The significance of this insight can be seen in a series of studies conducted in nursing homes in the 1990s. Researchers were studying why some seniors thrived inside such facilities, while others experienced rapid physical and mental declines. A critical difference, the researchers determined, was that the seniors who flourished made choices that rebelled against the rigid schedules, set menus, and strict rules that the nursing homes tried to force upon them.

- Tile choices that are most powerful in generating motivation, in other words, are decisions that do two things: They convince us we're in control and they endow our actions with larger meaning.

- This theory suggests how we can help ourselves and others strengthen our internal locus of control. We should reward initiative, congratulate people for self-motivation, celebrate when an infant wants to feed herself. We should applaud a child who shows defiant, self-righteous stubbornness and reward a student who finds a way to get things done by working around the rules.

- This is easier in theory, of course, than practice. We all applaud self-motivation until a toddler won't nut on his shoes, an aged parent is ripping a dresser out of the wall, or a teenager ignores

the rules. But that's how an internal locus of control becomes stronger. That's how our mind learns and remembers how good it feels to be in control.

- What's more, we need to prove to ourselves that our choices are meaningful. When we start a new task, or confront an unpleasant chore, we should take a moment to ask ourselves "why."

2: TEAMS Psychological Safety at Google and Saturday Night Live

- It always struck Julia as odd that those two teams felt so different. Her study group felt stressful because everyone was always jousting for leadership and critiquing each other's ideas. Her case competition team felt exciting because everyone was so supportive and enthusiastic. Both groups, however, were composed of basically the same kinds of people. They were all bright, and everyone was friendly outside of the team settings. There was no reason why the dynamic inside Julia's study group needed to become so competitive, while the culture of the case team was so easygoing.
- The People Analytics group—Google's human resource division (Get a meeting)
- People Analytics' biggest undertaking in recent years had been a study—code-named Project Oxygen before it was revealed—that examined why some managers were more effective than others. Ultimately, researchers had identified eight critical management skills. "Oxygen was a huge success for us," said Abeer Dubev. A People Analytics manager. "It helped clarify what differentiated good managers from everyone else and how we could help people improve." The project was so useful, in fact, that at about the same time Julia was hired, Google began another massive effort; this one code-named Project Aristotle.
- Project Oxygen found that a good manager (1) is a good coach; (2) empowers and does not micromanage; (3) expresses interest and concern in subordinates' success and well-being; (4) is results oriented; (5) listens and shares information; (6) helps with career development; (7) has a clear vision and strategy; (8) has key technical skills.
- And some norms, the data indicated, consistently correlated with high team effectiveness. One engineer, for instance, told the researchers that his team leader "is direct and straightforward, which creates a safe space for you to take risks   She also takes the time to ask how we are, figure out how she can help you and support you." That was one of the most effective groups inside Google.
- There is strong evidence that group norms play a critical role in shaping the emotional experience of participating in a team. Research by psychologists from Yale, Harvard, Berkeley, the University of Oregon, and elsewhere indicate that norms determine whether we feel safe or threatened, enervated or excited, and motivated or discouraged by our teammates.
- The data indicated that one particular norm—whether people were punished for missteps—influenced if they were honest after they screwed up.
- As her research continued, Edmondson found a handful of good norms that seemed to be consistently associated with higher productivity. On the best teams, for instance, leaders encouraged people to speak up; teammates felt like they could expose their vulnerabilities to one another; people said they could suggest ideas without fear of retribution; the culture discouraged people from making harsh judgments. As Edmondson's list of good norms grew, she began to notice that everything shared a common attribute: They were all behaviors that created a sense of togetherness while also encouraging people to take a chance.

- "We call it 'psychological safety,'" she said. Psychological safety is a "shared belief, held by members of a team, that the group is a safe place for taking risks." It is "a sense of confidence that the team will not embarrass, reject, or punish someone for speaking up," Edmondson wrote in a 1999 paper. "It describes a team climate characterized by interpersonal trust and mutual respect in which people are comfortable being themselves."
- When both teams first formed, each member was asked to complete what's known as the "Reading the Mind in the Eyes" test. They were each shown thirty-six photos of people's eyes and asked to choose which word, among four offered, best described the emotion that person was feeling. This test, you are told, measures people's empathy.
- "This kind of collective intelligence is a property of the group itself, not just the individuals in it." It was the norms, not the people that made teams so smart. The right norms could raise the collective intelligence of mediocre thinkers. The wrong norms could hobble a group made up of people who, on their own, were all exceptionally bright.
- There were, however, two behaviors that all the good teams shared. First, all the members of the good teams spoke in roughly the same proportion, a phenomenon the researchers referred to as "equality in distribution of conversational turn-taking." In some teams, for instance, everyone spoke during each task. In other groups, conversation ebbed from assignment to assignment—but by the end of the day, everyone had spoken roughly the same amount.
- Second, the good teams tested as having "high average social sensitivity"—a fancy way of saying that the groups were skilled at intuiting how members felt based on their tone of voice, how people held themselves, and the expressions on their faces.
- For psychological safety to emerge among a group, teammates don't have to be friends. They do, however, need to be socially sensitive and ensure everyone feels heard. "The best tactic for establishing psychological safety is demonstration by a team leader," as Amy Edmondson, who is now a professor at Harvard Business School, told me. "It seems like fairly minor stuff, but when the leader goes out of their way to make someone feel listened to, or starts a meeting by saying '1 might miss something, so I need all of you to watch for my mistakes,' or says 'Jim, you haven't spoken in a while, what do you think?' that makes a huge difference."
- Onstage, Bock brought up a series of slides "What matters are five key norms," he told the audience.
  - Teams need to believe that their work is important.
  - Teams need to feel their work is personally meaningful.
  - Teams need clear goals and defined roles.
  - Team members need to know they can depend on one another.
  - But, most important, teams need psychological safety.
- To create psychological safety. Bock said, team leaders needed to model the right behaviors. There were Google-designed checklists they could use: Leaders should not interrupt teammates during conversations, because that will establish an interrupting norm. They should demonstrate they are listening by summarizing what people say after they said it. They should admit what they don't know. They shouldn't end a meeting until all team members have spoken at least once. They should encourage people who are upset to express their frustrations, and encourage teammates to respond in nonjudgmental ways. They should call out intergroup conflicts and resolve them through open discussion.

- There were dozens of tactics on the checklist. All of them, however, came back to two general principles: Teams succeed when everyone feels like they can speak up and when members show they are sensitive to how one another feels.
- For three months. Project Aristotle traveled from division to division explaining their findings and coaching team leaders. Google's top executives released tools that any team could use to evaluate if members felt psychologically safe and worksheets to help leaders and teammates improve their scores.
- As a team leader, then, it's important to give people control. Some team leaders at Google make checkmarks next to people's names each time they speak, and won't end a meeting until those checks are all roughly equivalent. And as a team member, we share control by demonstrating that we are genuinely listening—by repeating what someone just said, by responding to their comments, by showing we care by reacting when someone seems upset or flustered, rather than acting as if nothing is wrong. When we defer to others' judgment, when we vocally treat others' concerns as our own, we give control to the group and psychological safety takes hold.

3: FOCUS Cognitive Tunneling, Air France Flight 447, and the Power of Mental Models

- In Optimal conditions, a human might fly for only about eight minutes per trip, during takeoff and landing.
- "Cognitive tunneling"— a mental glitch that sometimes occurs when our brains are forced to transition abruptly from relaxed automation to panicked attention.
- Cognitive tunneling can cause people to become overly focused on whatever is directly in front of their eyes or become preoccupied with immediate tasks. It's what keeps someone glued to their smartphone as the kids wail or pedestrians swerve around them on the sidewalk.
- Reactive thinking is at the core of how we allocate our attention, and in many settings, it's a tremendous asset. Athletes, for example, practice certain moves again and again so that, during a game, they can think reactively and execute plays faster than their opponents can respond. Reactive thinking is how we build habits, and it's why to-do lists and calendar alerts are so helpful: Rather than needing to decide what to do next, we can take advantage of our reactive instincts and automatically proceed. Reactive thinking, in a sense. Outsources the choices and control that, in other settings, create motivation.
- People like Darlene who are particularly good at managing their attention tend to share certain characteristics. One is a propensity to create pictures in their minds of what they expect to see. These people tell themselves stories about what's going on as it occurs. They narrate their own experiences within their heads. They are more likely to answer questions with anecdotes rather than simple responses. They say when they daydream, they're often imagining future conversations. They visualize their days with more specificity than the rest of us do.
- ==The first thing the== researchers noticed, as they began crawling through all that data, was that the firm's most productive workers, its superstars, shared a number of traits. The first was they tended to work on only five projects at once—a healthy load, but not extraordinary. There were other employees who handled ten or twelve projects at a time. But those employees had a lower profit rate than the superstars, who were more careful about how they invested their time.
- But as the economists looked more closely, they found the opposite: The superstars weren't choosing tasks that leveraged existing skills. Instead, they were signing up for projects that

required them to seek out new colleagues and demanded new abilities. That's why the superstars worked on only five projects at a time: Meeting new people and learning new skills takes a lot of additional hours.

- Something else the superstars had in common is they were disproportionately drawn to assignments that were in their early stages. This was surprising, because joining a project in its infancy is risky. New ideas often fail, no matter how smart or well executed. The safest bet is signing on to a project that is well under way.

- However, the beginning of a project is also more information rich. By joining fledgling initiatives, the superstars were cc'd on emails they wouldn't have otherwise seen. They learned which junior executives were smart and picked up new ideas from their younger colleagues. They were exposed to emerging markets and the lessons of the digital economy earlier than other executives. What's more, the superstars could later claim ownership of an innovation simply by being in the room when it was born, rather than fighting paternity battles once it was deemed a success.

- The superstars were constantly telling stories about what they had seen and heard. They were, in other words, much more prone to generate mental models. They were more likely to throw out ideas during meetings, or ask colleagues to help them imagine how future conversations might unfold, or envision how a pitch should go. They came up with concepts for new products and practiced how they would sell them. They told anecdotes about past conversations and dreamed up far-fetched expansion plans. They were building mental models at a near constant rate.

- By developing a habit of telling ourselves stories about what's going on around us, we learn to sharpen where our attention goes. These storytelling moments can be as small as trying to envision a coming meeting while driving to work—forcing yourself to imagine how the meeting will start, what points you will raise if the boss asks for comments, what objections your coworkers are likely to bring up

- If you want to make yourself more sensitive to the small details in your work, cultivate a habit of imagining, as specifically as possible, what you expect to see and do when you get to your desk. Then you'll be prone to notice the tiny ways in which real life deviates from the narrative inside your head. If you want to become better at listening to your children, tell yourself stories about what they said to you at dinnertime last night. Narrate your life, as you are living it, and you'll encode those experiences deeper in your brain. If you need to improve your focus and learn to avoid distractions, take a moment to visualize, with as much detail as possible, what you are about to do. It is easier to know what's ahead when there's a well rounded script inside your head.

- Companies say such tactics are important in all kinds of settings, including if you're applying for a job or deciding whom to hire. The candidates who tell stories are the ones every firm wants. "We look for people who describe their experiences as some kind of a narrative,"

- That's why we have human pilots. It's our job to think about what might happen, instead of what is." After the crew's visualization session, de Crespigny laid down some rules. "Everyone has a responsibility to tell me if you disagree with my decisions or think I'm missing anything."

- The plane was descending at fourteen feet per second. The maximum certified speed the undercarriage could absorb was only twelve feet per second. But there were no other options now.

- Mental models help us by providing a scaffold for the torrent of information that constantly surrounds us. Models help us choose where to direct our attention, so we can make decisions, rather than just react
- We may not recognize how situations within our own lives are similar to what happens within an airplane cockpit. But think, for a moment, about the pressures you face each day. If you are in a meeting and the CEO suddenly asks you for an opinion, your mind is likely to snap from passive listening to active involvement—and if you're not careful, a cognitive tunnel might prompt you to say something you regret. If you are juggling multiple conversations and tasks at once and an important email arrives, reactive thinking can cause you to type a reply before you've really thought out what you want to say.
- To become genuinely productive, we must take control of our attention; we must build mental models that put us firmly in charge. When you're driving to work, force yourself to envision your day, while you're sitting in a meeting or at lunch, describe to yourself what you're seeing and what it means. Find other people to hear your theories and challenge them. Get in a pattern of forcing yourself to anticipate what's next. If you are a parent, anticipate what your children will say at the dinner table. Then you'll notice what goes unmentioned or if there's a stray comment that you should see as a warning sign.

4: GOAL SETTING Smart Goals, Stretch Goals, and the Yom Kippur War

- "Some 400 laboratory and field studies [show] that specific, high goals lead to a higher level of task performance than do easy goals or vague, abstract goals such as the exhortation to 'do one's best,'"
- Many of the SMART goals the consultants found inside the factories were just as detailed—and just as trivial. Workers spent hours making sure their objectives satisfied every SMART criterion. But spent much less time making sure the goals were worth pursuing in the first place.
- Stretch goals can spark remarkable innovations, but only when people have a system for breaking them into concrete plans.
- This lesson can extend to even the most mundane aspects of life. Take, for instance, to-do lists. "To-do lists are great if you use them correctly" Timothy Pychyl, a psychologist at Carleton University, told me. "But when people say things like I sometimes write down easy items I can cross off right away, because it makes me feel good,' that's exactly the wrong way to create a to-do list. That signals you're using it for mood repair, rather than to become productive."
- The problem with many to-do lists is that when we write down a series of short-term objectives, we are, in effect, allowing our brains to seize on the sense of satisfaction that each task will deliver. We are encouraging our need for closure and our tendency to freeze on a goal without asking if it's the right aim. The result is that we spend hours answering unimportant emails instead of writing a big, thoughtful memo—because it feels so satisfying to clean out our in-box.

5: MANAGING OTHERS Solving a Kidnapping with Lean and Agile Thinking and a Culture of Trust

- In 1994, two business school professors at Stanford began studying how, exactly, one creates an atmosphere of trust within a company. For years, the professors—James Baron and Michael Hannan— had been teaching students that a firm's culture mattered as much as its strategy. The

way a business treats workers, they said. Was critical to its success. In particular, they argued that within most companies—no matter how great the product or loyal the customers—things would eventually fall apart unless employees trusted one another.

- The final category was known as the "commitment" model, and it was a throwback to an age when people happily worked for one company their entire life. "Commitment CEOs say things like, 'I want to build the kind of company where people only leave when they retire or die,'" said Baron. "That doesn't necessarily mean the company is stodgy, but it does imply a set of values that might prioritize slow and steady growth." Some Silicon Valley executives told Baron they saw commitment firms as outdated, remnants of a corporate paternalism that had undermined industries such as American manufacturing. Commitment companies were more hesitant to lay people off. They often hired HR professionals when other Start-ups were using precious dollars to recruit engineers or salespeople. "Commitment CEOs believe that getting the culture right is more important at first than designing the best product," Baron said.

- In fact, when Baron and Hannan looked at their data, they found the only culture that was a consistent winner was the commitment firms. Hands down, a commitment culture outperformed every other type of management style in almost every meaningful way. "Not one of the commitment firms we studied failed," said Baron. "None of them, which is amazing in its own right. But they were also the fastest companies to go public, had the highest profitability ratios, and tended to be leaner, with fewer middle managers, because when you choose employees slowly, you have time to find people who excel at self-direction." Employees in commitment firms wasted less time on internal rivalries because everyone was committed to the company, rather than to personal agendas

- Employees work smarter and better when they believe they have more decision making authority and when they believe their colleagues are committed to their success. A sense of control can fuel motivation, but for that drive to produce insights and innovations, people need to know their suggestions won't be ignored, that their mistakes won't be held against them. And they need to know that everyone else has their back.

6: DECISION MAKING Forecasting the Future (and Winning at Poker) with Bayesian Psychology

- And most surprising, a particular kind of lesson—training in how to think probabilistically— significantly increased people's abilities to forecast the future.

- The lessons on probabilistically thinking offered by the GJP had instructed participants to think of the future not as what's going to happen, but rather as a series of possibilities that might occur. It taught them to envision tomorrow as an array of potential outcomes, all of which had different odds of coming true. "Most people are sloppy when they think about the future," said Lyle Ungar, a professor of computer science at the University of Pennsylvania who helped oversee the GJP. "They say things like, 'It's likely we'll go to Hawaii for vacation this year.' Well, does that mean that it's 51 percent certain? Of 90 percent? Because that's a big difference if you're buying non-refundable tickets." The goal of the GJP's probabilistic training was to show people how to turn their intuitions into statistical estimates.

- The GJP's training modules instructed people in various methods for combining odds and comparing futures. Throughout, a central idea was repeated again and again. The future isn't one thing. Rather, it is a multitude of possibilities that often contradict one another until one of them

comes true. And those futures can be combined in order for someone to predict which one is more likely to occur.

- Many successful people, in contrast, spend an enormous amount of time seeking out information on failures. They read inside the newspaper's business pages for articles on companies that have gone broke. They schedule lunches with colleagues who haven't gotten promoted, and then ask them what went wrong. They request criticisms alongside praise at annual reviews. They scrutinize their credit card statements to figure out why, precisely, they haven't saved as much as they hoped. They pick over their daily missteps when they get home, rather than allowing themselves to forget all the small errors. They ask themselves why a particular call didn't go as well as they had hoped, or if they could have spoken more succinctly at a meeting.

- ==This, ultimately==, is one of the most important secrets to learning how to make better decisions. Making good choices relies on forecasting the future. Accurate forecasting requires exposing ourselves to as many successes and disappointments as possible. We need to sit in crowded and empty theaters to know how movies will perform; we need to spend time around both babies and old people to accurately gauge life spans; and we need to talk to thriving and failing colleagues to develop good business instincts.

- ==How do== we learn to make better decisions? In part, by training ourselves to think probabilistically To do that, we must force ourselves to envision various futures—to hold contradictory scenarios in our minds simultaneously—and then expose ourselves to a wide spectrum of successes and failures to develop an intuition about which forecasts are more or less likely to come true.

7: INNOVATION How Idea Brokers and Creative Desperation Saved Disney's Frozen

- But almost all of the creative papers had at least one thing in common: They were usually combinations of previously known ideas mixed together in new ways. In fact, on average, 90 percent of what was in the most "creative" manuscripts had already been published elsewhere— and had already been picked over by thousands of other scientists. However, in the creative papers, those conventional concepts were applied to questions in manners no one had considered before. "Our analysis of 17.9 million papers spanning all scientific fields suggests that science follows a nearly universal pattern," Uzzi and Jones wrote. "The highest-impact science is primarily grounded in exceptionally conventional combinations of prior work yet simultaneously features an intrusion of unusual combinations." It was this combination of ideas, rather than the ideas themselves, that typically made a paper so creative and important.

- That's why the Disney method is so powerful, because it pushes us to dig deeper and deeper until we put ourselves on the screen."

- Jerry Robbins pushed his collaborators in West Side Story to draw on their own experiences to become creative brokers. The Toyota Production System unlocked employees' capacity to suggest innovations by giving them more control. The Disney system does something different. It forces people to use their own emotions to write dialogue for cartoon characters, to infuse real feelings into situations that, by definition, are unreal and fantastical. This method is worth studying because it suggests a way that anyone can become an idea broker: by drawing on their own lives as creative fodder. We all have a natural instinct to overlook our emotions as creative material. But a key part of learning how to broker insights from one setting to another, to separate the real from the clichéd, is paying more attention to how things make us feel

- A few months after the story trust meeting, the songwriters Bobby Lopez and Kristen Anderson-Lopez were walking through Prospect Park in Brooklyn, anxious about all the songs they needed to write, when Kristen asked, "What would it feel like if you were Elsa?" As they walked past swing-sets and joggers, Kristen and Bobby began discussing what they would do if they were cursed and despised for something they couldn't control. "What if you tried to be good your entire life and it didn't matter because people constantly judged you?" she asked.

- Kristen knew this feeling. She had felt other parents' looks when she let their daughters eat ice cream instead of healthy snacks. She'd felt glances when she and Bobby let their girls watch an iPad inside a restaurant because they wanted a moment of peace. Perhaps Kristen wasn't cursed with some deadly power—but she knew what it felt like to be judged. It didn't feel fair. It wasn't her fault that she wanted a career. It wasn't her fault that she wanted to be a good mom and be a good wife and a successful songwriter, and so, inevitably, that meant things like home-packed snacks and sparkling dinner conversation—not to mention thank-you notes and exercise and replying to emails—sometimes fell by the wayside. She didn't want to apologize for not being perfect. She didn't think she needed to. And she didn't think Elsa should have to apologize for being flawed. Either.

- "Elsa has tried to do everything right, all her life," Kristen said 1 Bobby. "Now she's being punished for being herself and the only way out is for her to stop caring, to let it all go." As they walked, they began riffing, singing snippets of lyrics. What if they wrote a song that started with a fairy-tale opening, Bobby suggested, like the stories they read to their girls at night? Then Elsa could talk about the pressures of being a good girl, said Kristen. She jumped up on a picnic bench. "She could change into a woman," she said. "That's what growing up is, letting go of the things you shouldn't have to care about."

- She began singing to an audience of trees and trash cans, trying out lyrics for Elsa to convey that she's done being the good girl that she doesn't care what anyone thinks anymore. Bobby was recording her impromptu song on his iPhone. Kristen spread her arms. Let it go, let it go. That perfect girl is gone.

- The Frozen team had solved almost all their problems. No one wanted to lose all the progress they had already made. But they couldn't figure out how to end the film. "You start spinning when your flexibility drops," said Catmull. "You get so devoted to what you've already created. But you have to be willing to kill your darlings to go forward. If you can't let go of what you've worked so hard to achieve, it ends up trapping you."

- "The thing I noticed, when I first became a director, was that the change was subtle, but at the same time, very real," Jennifer Lee told me. "When you're a writer, there's certain things you know a film needs, but you're just one voice. You don't want to seem defensive or presumptuous because other people have just as many suggestions and your job is to integrate everyone's ideas. "A director, though, is in charge. So when I became a director, I felt like I had to listen even more closely to what everyone was saying because that was my job now. And as I listened, I started picking up on things I hadn't noticed before."

- However, Frozen could have only one ending. Someone had to make a choice. And the right decision, Lee wrote, is that "fear destroys us, love heals us. Anna's journey should be about learning what love is; it's that simple." At the end of the film, "when she sees her sister out on the fjords, she completes her arc by the ultimate act of true love: sacrificing your needs for someone else's. LOVE is a greater force than FEAR. Go with love."

- Later that month. Lee sat down with John Lasseter. "We need clarity," she told him. "The core of this movie isn't about good and evil, because that doesn't happen in real life. And this movie isn't about love versus hate. That's not why sisters grow apart. "This is a movie about love and fear. Anna is all about love, and Elsa is all about fear. Anna has been abandoned, so she throws herself into the arms of Prince Charming because she doesn't know the difference between real love and infatuation. She has to learn that love is about sacrifice. And Elsa has to learn that you can't be afraid of who you are, you can't run away from your own powers. You have to embrace your strengths. "That's what we need to do with the ending, show that love is stronger than fear."
- Lee described her theory of love versus fear again. Explaining how Olaf, the snowman, embodies innocent love while Prince Hans demonstrates that love without sacrifice isn't really love at all; it's narcissism.
- Creativity can't be reduced to a formula. At its core, it needs novelty, surprise, and other elements that cannot be planned in advance to seem fresh and new. There is no checklist that, if followed, delivers innovation on demand.
- But the creative process is different. We can create the conditions that help creativity to flourish. We know, for example, that innovation becomes more likely when old ideas are mixed in new ways. We know the odds of success go up when brokers—people with fresh. Different perspectives, who have seen ideas in a variety of settings— draw on the diversity within their heads. We know that, sometimes, a little disturbance can help jolt us out of the ruts that even the most creative thinkers fall into, as long as those shake-ups are the right size.
- If you want to become a broker and increase the productivity of your own creative process, there are three things that can help: First, be sensitive to your own experiences. Pay attention to how things make you think and feel. That's how we distinguish clichés from true insights. As Steve Jobs put it, the best designers are those who "have thought more about their experiences than other people." Similarly, the Disney process asks filmmakers to look inward. To think about their own emotions and experiences until they find answers that make imaginary characters come alive. Jerry Robbins pushed his West Side Story collaborators to put their own aspirations and emotions on the stage. Look to your own life as creative fodder, and broker your own experiences into the wider world.
- Second, recognize that the panic and stress you feel as you try to create isn't a sign that everything is falling apart. Rather, it's the condition that helps make us flexible enough to seize something new. Creative desperation can be critical; anxiety is what often pushes us to see old ideas in new ways. The path out of that turmoil is to look at what you know, to respect conventions you've seen work and try to apply them to fresh problems. The creative pain should be embraced.
- Finally, remember that the relief accompanying a creative breakthrough, while sweet, can also blind us to seeing alternatives. It is critical to maintain some distance from what we create. Without self-criticism, without tension, one idea can quickly crowd out competitors. But we can regain that critical distance by forcing ourselves to critique what we've already done, by making ourselves look at it from a completely different perspective, by changing the power dynamics in the room or giving new authority to someone who didn't have it before. Disturbances are essential, and we retain clear eyes by embracing destruction and upheaval, as long as we're sensitive to making the disturbance the right size.

- There's an idea that runs through these three lessons: The creative process is, in fact, a process, something that can be broken down and explained. That's important, because it means that anyone can become more creative; we can all become innovation brokers. We all have experiences and tools, disturbances and tensions that can make us into brokers—if, that is, we're willing to embrace that desperation and upheaval and try to see our old ideas in new ways.
- "Creativity is just problem solving," Ed Catmull told me. "Once people see it as problem solving, it stops seeming like magic, because it's not. Brokers are just people who pay more attention to what problems look like and how they've been solved before. People who are most creative are the ones who have learned that feeling scared is a good sign. We just have to learn how to trust ourselves enough to let the creativity out."

8: ABSORBING DATA Turning Information into Knowledge in Cincinnati's Public School

- Instead, the EI focused on changing how teachers made decisions in their classrooms. The reforms were built around the idea that data can be transformative, but only if people know how to use it. To change students' lives, educators had to understand how to transform all the spreadsheets and statistics and online dashboards into insights and plans. They had to be forced to interact with data until it influenced how they behaved.
- When those researchers visited South Avondale, teachers told them that the most important ingredient in the schools' turnaround was data—the same data, in fact, that the district had been collecting for years. Teachers said that a "data-driven culture" had actually transformed how they made classroom decisions.
- ==Each school, under== orders from the central office, had established a "data room"—in some cases, an empty conference room, in others, a large closet that had previously contained cleaning supplies—where teachers had to transcribe test scores onto index cards. They were told to draw graphs on butcher paper that was taped to walls. They ran impromptu experiments—do test scores improve if kids are placed in smaller reading groups? What happens when teachers trade off classes—and then scribbled the results onto whiteboards. Rather than simply receiving information, teachers were forced to engage with it. The EI had worked because instead of passively absorbing data, teachers made it "disfluent"—harder to process at first, but stickier once it was really understood. By scribbling out statistics and testing preconceptions, teachers had figured out how to use all the information they were receiving. The Elementary Initiative, paradoxically, had made data more cumbersome to absorb—but more useful. And from those index cards and hand-drawn graphs, better classrooms emerged.
- "If you make people use a new word in a sentence, they'll remember it longer. If you make them write down a sentence with the word, they'll start using it in conversations." When Alter conducts experiments, he sometimes gives people instructions in hard-to-read font because, as they struggle to make out the words, they read the text more carefully "The initial difficulty in processing the text leads you to think more deeply about what you're reading, so you spend more time and energy making sense of it," he said.
- But Fludd's employees noticed it, because they were looking for clues to prove or disprove theories. They were interacting with the data embodied in each conversation, turning it into something they could use. This is how learning occurs. Information gets absorbed almost without our noticing because we're so engrossed with it. Fludd took the torrent of data arriving each day

- and gave her team a method for placing it into folders that made it easier to understand. She helped her employees do something with all those memos they received and the conversations they were having—and, as a result, it was easier for them to learn.
- Then one day a third-grade teacher had an idea. Since he had to spend so much time transcribing test scores, he decided to also note on each student's index cards which specific questions they had gotten wrong on that week's assessment exam. He convinced another third-grade teacher to do the same. Next, they combined their cards and made piles by grouping students who had made similar mistakes. When they were done, the piles showed a pattern: A large number of students in one class had done well on pronoun use but had stumbled at fractions; a large number of students in the other classroom had scored the opposite way. The teachers traded curricula. Both classes' scores went up.
- The following week, someone else suggested dividing cards from multiple classes into piles based on where students lived. Teachers started giving everyone from the same neighborhoods similar reading assignments. Test scores ticked up. Students were doing their homework together on the bus rides home.
- That's how the school-wide Hot Pencil Drills started. Soon, students such as eight-year-old Dante were spending each morning filling out multiplication tables as fast as they could, and then speed-walking to the main office to have the fastest test takers' names read over the PA system. Within twelve weeks, the school's math scores were up by 9 percent.
- Psychologists say learning how to make decisions this way is important, particularly for young people, because it makes it easier for them to learn from their experiences and to see choices from different perspectives. This is a form of disfluency that allows us to evaluate our own lives more objectively, to offset the emotions and biases that might otherwise blind us to the lessons embedded in our pasts.
- In one study published in 2014, researchers from Princeton and UCLA examined the relationship between learning and disfluency by looking at the difference between students who took notes by hand while watching a lecture and those who used laptops. Recording a speaker's comments via longhand is both harder and less efficient than typing on a keyboard. Fingers cramp. Writing is slower than typing, and so you can't record as many words. Students who use laptops, in contrast, spend less time actively working during a lecture, and yet they still collect about twice as many notes as their handwriting peers. Put differently, writing is more disfluent than typing, because it requires more labor and captures fewer verbatim phrases.
- When the researchers looked at the test scores of those two groups, however, they found that the hand writers scored twice as well as the typists in remembering what a lecturer said.
- <mark>No matter what constraints</mark> were placed on the groups, the students who forced themselves to use a more cumbersome note-taking method—who forced disfluency into how they processed information—learned more. In our own lives, the same lesson applies: When we encounter new information and want to learn from it, we should force ourselves to do something with the data. It's not enough for your bathroom scale to send daily updates to an app on your phone. If you want to lose weight, force yourself to plot those measurements on graph paper and you'll be more likely to choose a salad over a hamburger at lunch. If you read a book filled with new ideas, force yourself to put it down and explain the concepts to someone sitting next to you and you'll be more likely to apply them in your life. When you find a new piece of information, force yourself

to engage with it, to use it in an experiment or describe it to a friend—and then you will start building the mental folders that are at the core of learning.

APPENDIX

- General Krulak had told me something that stuck with me: "Most recruits don't know how to force themselves to start something hard. But if we can train them to take the first step by doing something that makes them feel in charge, it's easier to keep going."
- I noticed two things: First, it was much easier to reply to an email once I had at least one sentence on the screen. Second, and more important, it was easier to get motivated when that first sentence was something that made me feel in control. When I told Jim that I could only stay for twenty minutes, it reminded me that I didn't have to commit to his project if I didn't want to. When I drafted a reply to someone asking me to come speak at a conference, I began by typing:
  - o I would like to leave on Tuesday and be back in New York by Thursday night.
- Which reinforced that I was in control of whether I attended or not.
- Self-motivation becomes easier when we see our choices as affirmations of our deeper values and goals.
- That's why Marine Corps recruits ask each other "why". "Why are you climbing this mountain?'
- Forcing ourselves to explain why we are doing something helps us remember that this chore is a step along a longer path, and that by choosing to take that journey, we are getting closer to more meaningful objectives.
- To motivate myself to read studies on airplanes, for instance, I began writing at the top of each manuscript why it was important for me to get that task done. When I pulled a study out of my bag. Then, it became a little easier to dive in. Something as simple as jotting down a couple of reasons why I am doing something makes it much simpler to start.
- TO GENERATE MOTIVATION
  - o Make a choice that puts you in control. If you're replying to emails, write an initial sentence that expresses an opinion or decision. If you need to have a hard conversation, decide where it will occur ahead of time. The specific choice itself matters less in sparking motivation than the assertion of control.
- I needed a stretch goal, something to spark big ambitions.
- AND I needed a SMART goal, to help me form a concrete plan.
- One of the most effective ways to formulate both objectives. Experts told me, is through a specific kind of to-do list. I needed to write out my goals—but in a way that forced me to identify my stretch objectives and my SMART aims. So I began writing to-do lists, and at the top of each one, I wrote my overarching ambition. What I was working toward in the long term. (That helped me avoid the need for cognitive closure that can force us to become obsessed with short-term, easy-to-achieve goals.)
- TO STAY FOCUSED
  - o Envision what will happen. What will occur first? What are potential obstacles? How will you preempt them? Telling yourself a story about what you expect to occur makes it easier to decide where your focus should go when your plan encounters real life.
- What's most important, throughout all these concepts, is the foundational idea undergirding these lessons, the tissue that connects the eight insights at the heart of this book: Productivity is about

recognizing choices that other people often overlook. It's about making certain decisions in certain ways. The way we choose to see our own lives; the stories we tell ourselves, and the goals we push ourselves to spell out in detail; the culture we establish among teammates; the ways we frame our choices and manage the information in our lives. Productive people and companies force themselves to make choices most other people are content to ignore. Productivity emerges when people push themselves to think differently.