

Irresistible: The Rise of Addictive Technology and the Business of Keeping Us Hooked

Adam Alter

Prologue: Never Get High on Your Own Supply

For ninety minutes, Jobs explained why the iPad was the best way to look at photos, listen to music, take classes on iTunes U, browse Facebook, play games, and navigate thousands of apps. He believed everyone should own an iPad.

But he refused to let his kids use the device.

It seemed as if the people producing tech products were following the cardinal rule of drug dealing: never get high on your own supply.

Greg Hochmuth, one of Instagram's founding engineers, realized he was building an engine for addiction. "There's always another hashtag to click on," Hochmuth said. "Then it takes on its own life, like an organism, and people can become obsessive." Instagram, like so many other social media platforms, is bottomless. Facebook has an endless feed; Netflix automatically moves on to the next episode in a series; Tinder encourages users to keep swiping in search of a better option. Users benefit from these apps and websites, but also struggle to use them in moderation. According to Tristan Harris, a "design ethicist," the problem isn't that people lack willpower; it's that "there are a thousand people on the other side of the screen whose job it is to break down the self-regulation you have."

In many respects, substance addictions and behavioral addictions are very similar. They activate the same brain regions, and they're fueled by some of the same basic human needs: social engagement and social support, mental stimulation, and a sense of effectiveness. Strip people of these needs and they're more likely to develop addictions to both substances and behaviors. Behavioral addiction consists of six ingredients: compelling goals that are just beyond reach; irresistible and unpredictable positive feedback; a sense of incremental progress and improvement; tasks that become slowly more difficult over time; unresolved tensions that demand resolution; and strong social connections.

Part 1: What Is Behavioral Addiction and Where Did It Come From?

Chapter 1: The Rise of Behavioral Addiction

App: Monument

Smartphones rob us of time, but even their mere presence is damaging. In 2013, two psychologists invited pairs of strangers into a small room and asked them to engage in conversation. To smooth the process, they psychologists suggested a topic: why not discuss an interesting event that happened to you over the past month? Some of the pairs talked while a smartphone sat idle nearby, while for others the phone was replaced by a paper notebook. Every pair bonded to some extent, but those who grew acquainted in the presence of the smartphone struggled to connect. They described the relationships that formed as lower in quality, and their partners as less empathetic and trustworthy. Phones are disruptive by their mere existence, even when they aren't in active use. They're distracting because they remind us of the world beyond the immediate conversation, and the only solution, the researchers wrote, is to remove them completely.

Obsessions are thoughts that a person can't stop having, and compulsions are behaviors a **p. 20** person can't stop enacting.

In 2000, Microsoft Canada reported that the average human had an attention span of twelve seconds; by 2013 that number had fallen to eight seconds. (According to Microsoft, a goldfish, by comparison, has an average attention span of nine seconds.) “Human attention is dwindling,” the report declared. Seventy-seven percent of eighteen- to twenty-four-year-olds claimed that they reached for their phones before doing anything else when nothing is happening. Eighty-seven percent said they often zoned out, watching TV episodes back-to-back. More worrying, still, Microsoft asked two thousand young adults to focus their attention on a string of numbers and letters that appeared on a computer screen. Those who spent less time on social media were far better at the task.

Addiction originally meant a different kind of strong connections: in ancient Rome, being addicted meant you had just been sentenced to slavery. If you owed someone money and couldn’t repay the debt, a judge would sentence you to addiction. You’d be forced to work as a slave until you’d repaid your debt. This was the first use of the word *addiction*, but it evolved to describe any bond that was difficult to break.

In 2013, a psychologist named Catherine Steiner-Adair explained that many American children first encounter the digital world when they notice that their parents are “missing in action.” “My mom is almost always on the iPad at dinner,” a seven-year-old named Colin told Steiner-Adair. “She’s always ‘just checking.’” Penny, also seven, said, “I always keep on asking her let’s play let’s play and she’s always texting on her phone.

Distracted parents cultivate distracted children, because parents who can’t focus teach their children the same attentional patterns. According to the paper’s lead researcher, “The ability of children to sustain attention is known as a strong indicator for later success in areas such as language acquisition, problem-solving, and other key cognitive development milestones. Caregivers who appear distracted or whose eyes wander a lot while their children play appear to negatively impact infants’ burgeoning attention spans during a key stage of development.

As addictive contexts go, this was a perfect storm: almost every teenage girl was using one or more social media platforms, so they were forced to choose between social isolation and compulsive overuse. No wonder so many of them spent hours texting and uploading Instagram posts every day after school; by all accounts, that was the rational thing to do.

Sluggishness is the enemy of addiction, because people respond more sharply to rapid links between action and outcome.

Chapter 2: The Addict in All of Us

This is why most heroin users struggle to stay clean. Like Cleopatra, they return to the scene of the crime over and over again. They see friends who remind them of a time when they were addicts; they live in the same homes; they walk through the same neighborhoods. Nothing changes once they’re clean, except the fact that instead of giving in to the addiction, they’re resisting it every day. This is why the temptation is so great. What else are they supposed to do when every sight, smell, and sound rekindles the moment of bliss that follows a hit?

Isaac told me that the most dangerous time for an addict is the first moment when things are going so well that you believe you’ve left the addiction behind forever. “You’re convinced that you’re fixed, so you can go back to doing what you were doing before. I let my guard down, and a buddy of mine sent me a text message that said, ‘Hey, you wanna play with us a little bit?’ And I went, ‘Hey, sure!’”

And even the most determined addicts-in-recovery will relapse when they revisit the people and places that remind them of the drug.

Chapter 3: The Biology of Behavioral Addiction

Blue light is a different story, because it signals morning. So 95 percent of us are inducing jet lag at night by telling our bodies that the day is beginning just before we go to bed.

As long as a behavior is rewarding--if it’s been paired with rewarding outcomes in the past--the brain will treat it the same way it treats a drug.”

The highest risk period for addiction is early adulthood. Very few people develop addictions later in life if they haven’t been addicted in adolescence. One of the major reasons is that young adults are bombarded by a galaxy of responsibilities that they’re not equipped to handle. They learn to medicate by taking up substances or behaviors that dull the insistent sting of those persistent hardships. By their mid-twenties, many people acquire the coping skills and social networks that they lack in adolescence. “If you aren’t using drugs as a teenager, you’re probably also

learning to deal with your troubles using other methods,” Szalavitz said. So you develop a degree of resilience by the time you emerge through the gauntlet of adolescence.

What makes addiction so difficult to treat is that wanting is much harder to defeat than liking.

Even after you come to hate a drug for ruining your life, your brain continues to want the drug. It remembers that the drug soothed a psychological need in the past, and so the craving remains. The same is true of behaviors: even as you come to loathe Facebook or Instagram for consuming too much of your time, you continue to want updates as much as you did when they still made you happy. One recent study suggests that playing hard to get has the same effect: an unattainable romantic partner is less likable but more desirable, which explains why some people find emotionally unavailable partners alluring.

Part 2: The Ingredients of Behavioral Addiction (or, How to Engineer an Addictive Experience)

Chapter 4: Goals

How is it possible that a hurdle had improved his patient’s gait? The answer is that, if you want to compel people to act, you whittle down overwhelming goals into smaller goals that are concrete and easier to manage.

If you focus on the milestone timers that arrive every half hour, you can see my struggle writ large. The dark bars indicate times just below those milestones (2:59, 3:29, 3:59, and 4:29), and you can see they’re a lot more common than slightly slower times (the two or three shorter bars to their right). Runners somehow find buried stores of energy as they strive to beat significant milestones, so many more of them finish in , say, 3:58 or 3:59 than in 4:01 or 4:02. In a race like the New York City Marathon, with almost fifty thousand runners, five hundred will finish with a time of 3:59, while just three hundred and ninety will finish with a time of 4:01. The size of that difference captures how urgently marathon runners want to finish in less than four hours. That’s the compelling power of goals: even when you’re two bananas shy of collapsing, you find the will to go on. So what happens when you reach your goal?

The final began the next morning. When GBeamon reflected on the event in an interview, forty years later, he remembered feeling “calm, very peaceful.” He later told interviewers he had thrown back a couple of tequila shots the night before, briefly abandoning his abstemious training regime. Three athletes were listed to jump before Beamon, but all three fouled their initial jumps, so Beamon was left without a target distance. His first jump took just seven seconds from beginning to end. He tore down the runway and leapt high and far, coming down a very long way from the beginning of the sandpit. GBeamon leapt so far that the electronic measurement system was incapable of calculating the jump’s distance. You can still watch the footage today: an earnest official moves the measuring device to the end of a fixed railing, and allows himself a brief smile when he realizes the jump is immeasurable. The officials confer briefly before they realize there isn’t a suitable measuring tape in the stadium. One of them is dispatched to find a tape while the event is suspended. Forty-five minutes pass, a tape is found, and after measuring and remeasuring, the officials put a number to Beamon’s colossal leap: eight meters and ninety centimeters, or twenty-nine feet, two and a half inches. Beamon had jumped almost two feet--fifty-five centimeters--farther than any other man in history. He collapsed to the track as Boston tried to help him to his feet, only to collapse again before his legs could support his weight. Watching the footage, one doctor diagnosed Beamon with a cataplectic seizure brought on by the emotional shock of his achievement. The jump was so impressive that the word *Beamonesque* came to signify an otherworldly achievement that dwarfs its predecessors.

Beamon is perhaps unusually reserved, but even flamboyant goal-setters struggle with outrageous success.

Like the curse that doomed Sisyphus to roll a boulder uphill for eternity, it’s hard not to wonder whether major life goals are by their nature a major source of frustration. Either you endure the anti-climax of succeeding, or you endure the disappointment of failing. All of this matters now more than ever because there’s good reason to believe we’re living through an unprecedented age of goal culture--a period underscored by addictive perfectionism, self-assessment, more time at work, and less time at play.

How long do you think the average office email goes unread? I guessed ten minutes. The truth is just six seconds. In reality, 70 percent of office emails are read within six seconds of arriving. Six seconds is less time than it’s taken you to read this paragraph so far, but it’s long enough for the average worker to disrupt whatever he’s doing to open his email program and click on the incoming email.

Sim is a clinical child adolescent psychologist at the Mayo Clinic. Many of Sim’s adolescent patients have twin exercise and eating disorders, which tend to go together.

Chapter 5: Feedback

Their brains, it turned out, were releasing far more dopamine when the reward was unexpected than when it was predictable. Zeiler had documented an important fact about positive feedback: that less is often more. His pigeons were drawn to the mystery of mixed feedback just as humans are attracted to the uncertainty of gambling.

Now imagine you play all fifteen lines, costing you \$1.50, and one of your lines spins two bombs in a row, as line four does, above. If two bombs are worth a payout of ten credits, you get a payout of \$1. Not bad--until you realize the net effect of that spin is a loss of fifty cents (your \$1 payout minus the cost of the spin at \$1.50). And yet you enjoy the positive feedback that follows a win--a type of win that Schull and other gambling experts call a "loss disguised as a win."

At its peak in 2013, the game [Candy Crush] generated more than \$600,000 in revenue per day.

Chapter 6: Progress

The young hero of the game was a mustachioed plumber named Mario, who was named for Nintendo America's warehouse landlord, Mario Segale.

Super Mario Bros. hooks newcomers because there are no barriers to playing the game. You can know absolutely nothing about the Nintendo console and still enjoy yourself from the very first minute. There's no need to read motivation-sapping manuals or grind through educational tutorials before you begin. Instead, your avatar, Mario, appears on the left-hand side of an almost empty screen.

Because the screen is empty, you can push the Nintendo controller's buttons randomly and harmlessly, learning which ones make Mario jump and which ones make him move left and right. You can't move any further left, so you quickly learn to move right. And you aren't reading a guide that tells you which keys are which--instead, you're learning by doing, and enjoying the sense of mastery that comes from acquiring knowledge through experience. The first few seconds of gameplay are brilliantly designed to simultaneously do two very difficult things: teach, and preserve the illusion that nothing is being taught at all.

Chapter 7: Escalation

So they preferred to endure the unpleasantness of a shock to the experience of sitting quietly with their thoughts. In the experimenters' words, "most people prefer to be doing something rather than nothing, even if that something is negative."

That's why people spend precious chunks of free time doing difficult crosswords and climbing dangerous mountains--because the hardship of the challenge is far more compelling than knowing you're going to succeed.

Vygotsky explained that children learn best, and are most motivated, when the material they're learning is *just* beyond the reach of their current abilities. In the classroom context, this means a teacher guides them to clear the hurdle presented by the task, but not so heavy-handedly that they feel their existing skills weren't useful in reaching the task's solution. Vygotsky called this the "zone of proximal development," which he represented with this simple diagram: (*diagram pictures three concentric circles, with the innermost circle reading "Things the Learning Can Do Without Help," the middlemost circle reading "Zone of Proximal Development: Things the Learner Can Do With Help", and the outermost circle reading "Things the Learner Can't Do At All"*)

The ludic loop is preserved, and you're never yanked from your flow. The game's music has the same effect. "The music starts in a random place when you restart," Cavanagh said. If the music started in the very beginning every single time you died you'd feel like 'Oh, I've lost and I have to start again from the beginning.' It's really important you don't feel that way, you don't feel like you've lost.

Slot machine wins seem to be tantalizingly close, when in fact there's no material difference between a near win and a clear loss. Neither one signals that you're more or less likely to win the jackpot in the future, since it's illegal to change the odds of winning on any particular spin.

Chapter 8: Cliffhangers

The results were striking. Like the waiter in Vienna, her participants recalled about twice as many unfinished tasks as they did finished ones. At first, Zeigarnik wondered whether the unfinished tasks were more memorable because participants experienced a small "shock" when they were interrupted. But when she ran a similar experiment, again interrupting her participants as they completed some tasks but then allowing them to complete those tasks later, the effect vanished. It wasn't interruption that made the tasks memorable, but rather the tension from not being able to complete them.

A cliffhanger only lasts until you know whether the bus plunges, a waiter only remembers an order until the

plate reaches his customer, and the fate of a mobster from suburban New Jersey remains interesting only as long as you don't know whether he lives or dies.

What's striking about Cassandra22007's behavior is that she wasn't buying clothes because she needed them. Just as Greg Berns had shown with his juice experiment, it wasn't so much the reward itself that mattered, but rather the thrill of the chase. Gilt didn't provide shoppers like Meier and Cassandra22007 with products they couldn't get elsewhere--it provided them with a string of micro-cliffhangers that made the act of hunting down those products deeply addictive.

In August 2012, Netflix introduced a subtle new feature called "post-play." With post-play, a thirteen-episode season of *Breaking Bad* became a single, thirteen-hour film. As one episode ended, the Netflix player automatically loaded the next one, which began playing five seconds later. If the previous episode left you with a cliffhanger, all you had to do was sit still as the next episode began and the cliffhanger resolved itself. Before August 2012 you had to decide to watch the next episode; now you had to decide to *not* watch the next episode.

Chapter 9: Social Interaction

A dud photo that attracts only three likes on Instagram is a bit like a Barry Manilow shirt. It's embarrassing to its owner, who assumes that other users are staring and laughing, when in fact they're far more concerned with their own photos, or at least with the endless line of photos that come before and after the "Manilow" shot.

O'Neill attracted some backlash. Former friends accused her of "100 percent self-promotion," and others called her new campaign "a hoax." But tens of thousands of others praised her publicity. "Read her captions--this girl is a boss," said one. "Aah, so good, love what she's doing," said another. O'Neill was voicing publicly what thousands of Instagram users felt across the globe: that the pressure to present perfection with every shot is relentless and, for many people, unbearable. In her last post, O'Neill wrote, "I've spent the majority of my teenage life being addicted to social media, social approval, social status, and my physical appearance. Social media is contrived images and edited clips ranked against each other. It's a system based on social approval, likes, validation, in views, success in followers. It's perfectly orchestrated self-absorbed judgment."

He told me that addictive games have three critical elements: "The first part is immersion--the sense that you're embedded in the game. The second is achievement--the sense that you're achieving something. And the third--and by far the most important--is the social element,"

Even addicts who, like Isaac Vaisberg, somehow win the charisma lottery are susceptible to a range of psychological and social disorders. One study found that gamers aged between ten and fifteen years who played more than three hours per day were less satisfied with their lives, less likely to feel empathy toward other people, and less likely to know how to deal with their emotions appropriately. Three hours may sound like a lot, but recent surveys have shown that kids spend an average of five to seven hours in front of screens each day. When today's Millennials become adults, there's a fair chance their social cucumber brains will be pickled.

Part 3: The Future of Behavioral Addiction (and Some Solutions)

Chapter 10: Nipping Addictions at Birth

A couple of years ago, I became interested in what we call *hardship inoculation*. This is the idea that struggling with a mental puzzle--trying to remember a phone number or deciding what to do on a long Sunday afternoon--inoculates you against future mental hardships just as vaccinations inoculate you against illness. Reading a book, for example, is harder than watching the TV. (David Denby, a film critic at the *New Yorker*, recently wrote that kids are abandoning books as they age. "Books smell like old people," he overheard one teenager say.) There is good early evidence to support the idea that small doses of mental hardship are good for us. Young adults do much better on tricky mental puzzles when they've solved difficult (rather than easy) ones earlier. Adolescent athletes also thrive on challenges: we've found, for example, that college basketball teams do better when their preseason schedules are more demanding. These mild initial struggles are critical.

Turkle illustrates the limitations of cell phone communication by recounting an observation that comedian Louis C.K. shared with Conan O'Brien in 2013. He explained that he was not raising children; he was raising the grown-ups they're going to be. Phones, he said, are "toxic, especially for kids."

They don't look at people when they talk to them. And they don't build the empathy. You know, kids are mean. And it's because they're trying it out. They look at a kid and they go, "You're fat." And they see the kid's face scrunch up and they go, "Ooh, that doesn't feel good to make a person do that" ... but when they write, "You're fat," then they just go, "Mmm, that was fun. I like that."

Scariness comes in the form of rigid, judgmental intensity. As parents become more worried, their claims

naturally escalate. Statements like, “You’ll ruin your chances for college!” or “You will never bring that friend into this house again!” are guaranteed to alienate kids. Crazy parents overreact when their children come to them with problems. Steiner-Adair describes the case of a twelve-year-old girl who received a hurtful email from her friend. “She couldn’t talk about things like this because mom always had a way of ramping up the drama on everything. ‘She’ll say “that’s horrible!” and then get started, and then I not only have my friend to deal with but my crazy mother, too.’” It’s clear that the girl’s mother cares--she wants her daughter to feel better--but her instinctive, escalating response makes the problem worse. Clueless parents, on the other hand, are objects of pity. They either don’t understand the lives their children lead, or they find it overwhelming. “A clueless parent tries too hard” to befriend his kid, says Steiner-Adair. “He misses cues, often engaging over superficial things while failing to have meaningful conversations with his child about life values and about expectations and consequences.”

In contrast to the scary, crazy, and clueless parents are those who are “Approachable, Calm, Informed, and Realistic.” They understand that social media is a part of the real world. Sometimes their children will be upset, but overreaction makes the problem worse. These parents take the time to understand how their kids interact with social networking platforms. They ask non-judgmental questions of their kids and do their own research. They also impose boundaries, creating the sort of sustainable relationship with tech promoted at reSTART. The family engages in meaningful offline conversations, and at certain points in the day, everyone is offline together. Some of these ideals might seem obvious in the abstract, but they’re not always easy to achieve in the heat of the moment. Steiner-Adair’s mantra --Approachable, Calm, Informed, Realistic--is a useful rule of thumb when tensions rise.

It’s far easier to prevent people from developing addictions in the first place than it is to correct existing bad habits, so these changes should begin not with adults, but with young kids.

Parents have always taught their children how to eat, when to sleep, and how to interact with other people, but parenting today is incomplete without lessons on how to interact with technology, and for how long each day.

...we all know how terrible addiction is, but it also has benefits, and this tends to be the most meaningful part of the puzzle.

Motivation research: Self-Determination Theory (SDT). SDT explains that people are naturally proactive, especially when a behavior activates one of three central human needs: the need to feel in command of one’s life (autonomy); the need to form solid social bonds with family and friends (relatedness); and the need to feel effective when dealing with the external environment--learning new skills and overcoming challenges (competence). Though addictive behaviors are designed to soothe psychological discomfort, they also tend to frustrate one or more of these needs. A motivational interview makes that frustration clear: if you’re asked how your Instagram use affects your well-being, you’re going to see that it’s compromising your productivity, your relationships, or both. Far from rendering a person powerless in the face of her addiction, she’s left to feel both motivated and capable of changing for the better.

Chapter 11: Habits and Architecture

“Willpower is about looking at those yummy chocolate chip cookies and refusing them. A good habit ensures you’re rarely around those chocolate chip cookies in the first place.”

A psychologist named Dan Wegner first described this puzzle in the late 1980s. The problem, Wegner saw, was that suppression is unfocused. You know what to avoid, but not what to do with your mind instead. When Wegner asked people to ring a bell every time they thought about a forbidden white bear, their bells dinged constantly. But when he told them it might help to think about a red Volkswagen instead, their bells rang half as often. Suppression alone doesn’t work--but suppression paired with distraction works pretty well.

In his book, *The Power of Habit*, the writer Charles Duhigg described this form of habit change as the Golden Rule. According to the Golden Rule, habits consist of three parts: a *cue* (whatever prompts the behavior); a *routine* (the behavior itself); and a *reward* (the payoff that trains our brains to repeat the habit in the future). The best way to overcome a bad habit or an addiction is to keep the cue and the reward consistent while changing the routine--by replacing the original behavior with a distraction. For nail-biters, the cue might be the fidgeting that goes on just before they begin chewing--a subtle search for rough nail-ends that can be smoothed by chewing. Instead of chewing at that point, they might adopt the new routine of playing with a stress ball. And finally, since the reward might be the sense of completeness that comes from chewing the tough nail ends, the nail-biter might complete ten squeezes of the stress ball. So the cue and the reward stay the same, but the routine changes from nail-biting to squeezing the stress ball ten times.

Billed as “the smart device for the good of humanity,” Realism was designed to treat smartphone addiction.

There is one subtle psychological lever that seems to hasten habit formation: the language you use to describe your behavior. Suppose you were trying to avoid using Facebook. Each time you’re tempted, you can either tell yourself “I can’t use Facebook,” or you can tell yourself “I don’t use Facebook. They sound similar, and the difference may seem trivial, but it isn’t. “I can’t” wrests control from you and gives it to an unnamed outside agent. It’s disempowering. You’re the child in an invisible relationship, forced not to do something you’d like to do, and, like children, many people are drawn to whatever they’re not allowed to do. In contrast, “I don’t” is an empowering declaration that this isn’t something you do. It gives the power to you and signals that you’re a particular kind of person—the kind of person who, on principle, doesn’t use Facebook.

The missing piece in the treatment puzzle is to redesign your environment so temptations are as close to absent as possible. That’s the idea behind the technique of *behavioral architecture*. How far are you from your phone right now? Can you reach it without moving your feet? And, when you sleep, can you reach your phone from your bed? If you’re like many people, this is the first time you’ve considered those questions.

A Dutch design studio called HelderGroen has rigged its office furniture to automatically rise to the ceiling at six o’clock every evening. The desks, tables, and computers are connected to strong steel cables that wind upward through a pulley system driven by a powerful motor. After six, the space becomes a yoga studio or a dance floor—or any other activity that thrives on a blank floor plan. German car manufacturer Daimler has a similar email management policy. The company’s one hundred thousand employees can set incoming emails to delete automatically when they’re on vacation. A so-called *mail on holiday* assistant automatically emails the sender to explain that the email wasn’t delivered, and suggests another Daimler employee who will step in if the email is urgent. Workers come back from their vacations to an inbox that looks exactly as it did when they left several weeks ago.

Rewards are a lot more fun than punishments, but if you’re looking to change a habit small punishments or inconveniences are often more effective.

Maneesh Sethi is an entrepreneur who designed a product called Pavlok, which uses the power of negative feedback to discourage bad addictive habits. “These are two kinds of people,” Sethi told me. “People who generate lots of ideas, and people who can execute those ideas.” Sethi describes himself as an ideas man. “A few years ago, I hired a girl to slap me in the face every time I went on Facebook.” That worked well, for a while, but Sethi developed a more permanent solution in the form of Pavlok, a small wearable wristband that gives feedback whenever the wearer engages in a forbidden bad habit. This is known as aversion therapy: pairing an action you’d like to change with an unpleasant or aversive sensation. At the subtle end of the spectrum, Pavlok beeps or vibrates when you do something you’ve pledged not to do, and at the invasive end it delivers a moderate electric shock, or zap. Users can administer the negative feedback manually, or they can pair the device with an app that automatically delivers the feedback in response to pre-determined cues.

If, on the other hand, you achieve your daily usage goal, you tear open the envelope and spend the money *relationally*: you take a friend to lunch, buy your son an ice cream, or buy your spouse a gift. Relational spending has two advantages: it makes you accountable, so failing to reach your goal, also hurts someone else; and it’s a superior reward, because spending on others makes you happier than spending on yourself or paying your bills.

Chapter 12: Gamification

Other commuters took note, and soon the stairs were more popular than the escalator. According to the video, “66 percent more people than normal chose the stairs over the escalator.” People flock when you turn a mundane experience into a game.

Gamification doesn’t help much when an experience is already fun; it does its best work when the experience is boring. On-the-job training is perhaps the most notoriously boring part of work. At the same time, training is critically important, because poorly trained workers are less productive and less safe. A number of companies are starting to train their employees with games. The Hilton Garden Inn, for example, hired the Virtual Heroes game design studio to develop a virtual training hotel. The game puts team members in a three-dimensional, virtual Hilton Garden Inn hotel, where they serve guests within a timed deadline. Their responses are graded for speed and appropriateness, which translate into Satisfaction and Loyalty Tracking (SALT) scores. The hotels assess employees with SALT scores in the real world, so the virtual game environment is an excellent simulation. Since Hilton’s

success, Virtual Heroes has taken on a raft of large corporate clients, including the U.S. Army, the Discovery Channel, the Department of Homeland Security, BP, and Genetech.

These games aren't just fun; they're also engaging, and they improve job performance and retention. Traci Sitzmann, a management professor at the University of Colorado, studies the role of games in on-the-job training. In one sweeping study, she examined the results from sixty-five studies that compared game-based and offline training. Across nearly seven thousand trainees, she found that game-based training was far more effective than offline training: trainees who used video games had a 9 percent higher retention rate, remembered 11 percent more facts, and rated 14 percent high on skill-based knowledge tests. Trainees also felt 20 percent more confident and capable after playing the games, since they relied on active, hands-on experience rather than passive instruction.

In 2009, the team, led by Emily Holmes, tested a novel PTSD intervention. They asked a group of adults to watch a twelve minute video featuring "elevent clips of traumatic content including graphic real scenes of human surgery, fatal road traffic accidents and drowning." This was their trauma simulation, and the participants who completed their study were indeed traumatized. Before the intervention they reported feeling calm and relaxed; afterward they were disturbed and jittery. Holmes and her team forced the adults to wait for thirty minutes--a simulation of the half hour wait a person might experience before being admitted to an emergency room. Then, half of the participants played Tetris for ten minutes, while the other half sat quietly.

The adults went home for a week, and recorded their thoughts in a daily diary. Once a day they recounted the scenes from the video that replayed in their minds. Some saw cars colliding, and others remembered horrific scenes of human surgery. But the flashbacks affected some people more than others. Those who had sat quietly after watching the harrowing video experienced an average of six flashbacks during the week; those who had played Tetris experienced an average of fewer than three. Tetris, with its colors and music and rotating blocks, prevented the initial traumatic memories from solidifying. The game soaked up the mental attention that might have otherwise moved those horrific memories to long-term memory, and so they were stored imperfectly or not at all. At the end of the week, the adults, returned to the lab, and those who had been lucky enough to play Tetris reported fewer psychiatric symptoms. The game had functioned as a "cognitive vaccine," the researchers explained. Although the video had traumatized them in the short-term, Tetris had prevented it from traumatizing them in the long-term.