The Science of Habit Change

Introduction:

When we speak of the struggle with pornography, the word “addiction” is often used. Addiction sounds like a scary word, but it’s really just another way of describing **habits** that have become deeply ingrained in our brains.

The New York Times Best Seller book “The Power of Habit” by Charles Duhigg, can help us gain a deep understanding into how habits work and how they are susceptible to change. With the understandings from this fascinating book, based on up-to-date scientific studies, we can hopefully gain valuable insight into how we can regain control over our unwanted lustful behaviors.

In the coming pages, we will attempt to bring you a summary of the parts of this book that are perhaps most relevant to our struggle.

The Magic Formula for Habit Change

When you woke up this morning, what did you do first? Did you hop in the shower, check your email, or grab a donut from the kitchen counter? Did you tie the left or right shoe first? Did you choose a salad or hamburger for lunch? When you got home, did you put on your sneakers and go for a run, or eat dinner in front of the internet?

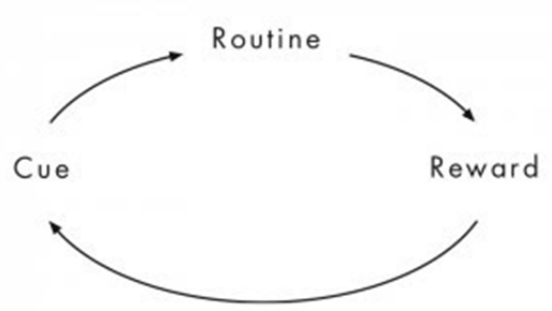
Most of the choices we make each day may feel like the products of well-considered decision making, but they’re not. They’re habits.

The basal ganglia, a small region of the brain situated at the base of the forebrain, plays an important role in stored habits. Habits, scientists say, emerge because the brain is constantly looking for ways to save effort. Interestingly, scientists have discovered that mental activity in the basal ganglia actually *decreases* as a behavior becomes more habitual. When a habit emerges, the brain becomes more efficient (and needs fewer resources) because automatic patterns take over. When we get dressed in the morning or drive a car, instead of needing to remember and decide what to do at every step of way, the brain has chunked hundreds of routines into habits that we no longer have to think about when we do them. This effort saving instinct is a huge advantage. An efficient brain allows us to stop thinking constantly about our basic behaviors, such as walking and eating, so we can devote mental energy to more important tasks.

And at the core of every habitual pattern is a **habit loop.**

The habit loop can be broken down into three basic steps:

1. A cue (or trigger)
2. A routine
3. A reward

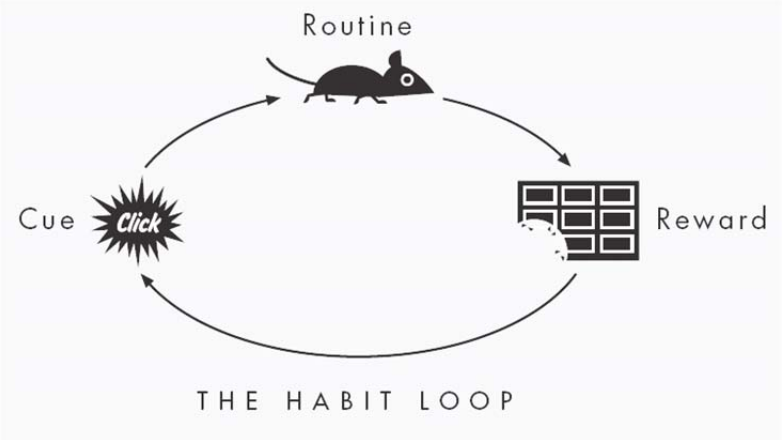


First, there is a cue, a trigger that tells your brain to go into automatic mode. The cue can be internal, such as a feeling or thought, or external, such as a time of day, place or the company of certain people.

The second part of the habit loop is the **routine,** the behavior that leads to the reward. The routine can be physical (eating a donut), cognitive ("remember for the test"), or emotional ("I always feel anxious in math class").

The third part is the **reward.** Not surprisingly, the reward can also be physical (sugar!), cognitive ("that's really interesting"), or emotional ("I always feel relaxed when reading the news."). The reward helps the brain determine if a particular habit loop is worth remembering.

In the habit loop illustrated below, a mouse learns to automatically run through a maze after hearing a click, because the habit has become ingrained through a chocolaty reward.



When a habit emerges, the frontal lobe of the brain where decisions are made, stops fully participating in the process. It stops working so hard, or diverts focus to other tasks. So unless you deliberately fight a habit – unless you find new routines – the pattern will unfold automatically.

However, simply understanding how habits work – learning the structure of the habit loop – makes them easier to control. Once you break a habit into its components, you can fiddle with the gears.

Habits never really disappear. They're encoded into the structure of our brain, and that's a huge advantage for us, because it would be awful if we had to learn how to drive after every vacation. The problem is that your brain can't tell the difference between bad and good habits, and so if you have a bad one, it's always lurking there, waiting for the right cues and rewards.

This explains why it's so hard to create exercise habits, for instance, or change what we eat. Once we develop a routine of sitting on the couch, rather than running, or snacking whenever we pass a doughnut box, those patterns always remain inside of our heads. By the same rule, though, if we learn to create new neurological routines that overpower those behaviors – if we take control of the habit loop – we can force those bad tendencies into the background. And once someone creates a new pattern, studies have demonstrated, going for a jog or ignoring the doughnuts becomes as automatic as any other habit. In other words, once we learn to override the old pattern, the new pattern takes over and becomes a new habit.

The Golden Rule of Habit Change

Studies have shown that you can never really extinguish habits (as they say in the 12-Step groups "Once an addict always an addict"). But understanding how habits work—or, understanding the habit loop—makes them easier to control.

To change a habit, we only need to attack the middle step, the routine. It's easier to adopt a new behavior if there's something familiar at the beginning and end. And that's the **Golden Rule of Habit Change,** which is based on keeping the old cue, delivering the old reward, but inserting a new routine.

If you use the same cue, and provide the same reward, you can shift the routine and change the habit. Almost any behavior can be transformed if the cue and reward stay the same.

The Golden Rule has influenced treatments for alcoholism, obesity, obsessive compulsive disorders, and hundreds of other destructive behaviors, and understanding it can help anyone change their own habits. (Attempts to give up snacking, for instance, will often fail unless there's a new routine to

satisfy old cues and reward urges. A smoker usually can’t quit unless he finds some activity to replace cigarettes when the nicotine craving is triggered.)

It sounds easy in theory, but given the strength of most habit loops, changing behaviors can be very difficult.

To understand the **Golden Rule of Habit Change** better and begin to apply it to our own bad habits, let us explore one of the largest and most successful attempts at wide-scale habit change, which was born in a dingy basement on the Lower East Side of New York City in 1934.

Sitting in the basement was a thirty-nine-year-old alcoholic named Bill Wilson. Years earlier, Wilson had taken his first drink during officers' training camp in New Bedford, Massachusetts, where he was learning to fire machine guns before getting shipped to France and World War I. Prominent families who lived near the base often invited officers to dinner, and one Sunday night, Wilson attended a party where he was served rarebit and beer. He was twenty-two years old and had never had alcohol before. The only polite thing, it seemed, was to drink the glass served to him. A few weeks later, Wilson was invited to another elegant affair. Men were in tuxedos, women were flirting. A butler came by and put a Bronx cocktail-a combination of gin, dry and sweet vermouth, and or ange juice-into Wilsons hand. He took a sip and felt, he later said, as if he had found "the elixir of life."

By the mid-1930s, back from Europe, his marriage falling apart and a fortune from selling stocks vaporized, Wilson was consuming three bottles of booze a day. On a cold November afternoon, while He was sitting in the gloom, an old drinking buddy called. Wilson invited him over and mixed a pitcher of pineapple juice and gin. He poured his friend a glass.

His friend handed it back. He'd been sober for two months, he said.

Wilson was astonished. He started describing his own struggles with alcohol, including the fight he'd gotten into at a country club that had cost him his job. He had tried to quit, he said, but couldn’t manage it. He'd been to detox and had taken pills. He'd made promises to his wife and joined abstinence groups. None of it worked. How, Wilson asked, had his friend done it?

"I got religion," the friend said. He talked about hell and temptation sin and the devil. "Realize you are licked, admit it, and get willing to turn your life over to God."

Wilson thought the guy was nuts. "Last summer an alcoholic crackpot; now, I suspected, a little cracked about religion," he later wrote. When his friend left, Wilson polished off the booze and went to bed.

A month later, in December 1934, Wilson checked into the Charles B. Towns Hospital for Drug and Alcohol Addictions, an upscale Manhattan detox center. A physician started hourly infusions of a hallucinogenic drug called belladonna, then in vogue for the treatment of alcoholism. Wilson floated in and out of consciousness on a bed in a small room.

Then, in an episode that has been described at millions of meetings in cafeterias, union halls, and church basements, Wilson began writhing in agony. For days, he hallucinated. The withdrawal pains made it feel as if insects were crawling across his skin. He was so nauseous he could hardly move, but the pain was too intense to stay still. "If there is a God, let Him show Himself!" Wilson yelled to his empty room. "I am ready to do anything. Anything!" At that moment, he later wrote, a white light filled his room, the pain ceased, and he felt as if he were on a mountaintop, "and that a wind not of air but of spirit was blowing. And then it burst upon me that I was a free man. Slowly the ecstasy subsided. I lay on the bed, but now for a time I was in another world, a new world of consciousness."

Bill Wilson would never have another drink. For the next thirty-six years, until he died of emphysema in 1971, he would devote himself to founding, building, and spreading Alcoholics Anonymous, until it became the largest, most well-known and successful habit changing organization in the world.

An estimated 2.1 million people seek help from AA each year, and as many as 10 million alcoholics may have achieved sobriety through the group. AA doesn't work for everyone-success rates are difficult to measure, because of participants' anonymity-but millions credit the program with saving their lives. AA's foundational credo, the famous twelve steps, have become cultural lodestones incorporated into treatment programs for overeating, gambling, debt, sex, drugs, hoarding, self-mutilation, smoking, video game addictions, emotional dependency, and dozens of other destructive behaviors.

The group's techniques offer, in many respects, one of the most powerful formulas for change. All of which is somewhat unexpected, because AA has almost no grounding in science or most accepted therapeutic methods. Alcoholism, of course, is more than a habit. It's a physical addiction with psychological and perhaps genetic roots. What’s interesting about AA, however, is that the program doesn’t directly attack many of the psychiatric or biochemical issues that researches say are often at the core of why alcoholics drink. In fact, AA’s methods seem to sidestep scientific and medical findings altogether, as well as the type of intervention many psychiatrists say alcoholics really need.

What AA provides instead is a method for attacking the habits that surround alcohol use. AA, in essence, is a giant machine for changing habit loops. And though the habits associated with

alcoholism are extreme, the lessons AA provides demonstrate how almost any habit - even the most obstinate - can be changed.

Bill Wilson didn’t read academic journals or consult many doctors before founding AA. A few years after he achieved sobriety, he wrote the now-famous twelve steps in a rush one night while sitting in bed. He chose the number twelve because there were twelve apostles. And some aspects of the program are not just unscientific, they can seem downright strange.

Take, for instance, AA's insistence that alcoholics attend "ninety meetings in ninety days"-a stretch of time, it appears, chosen at random. Or the programs intense focus on spirituality, as articulated in step three, which says that alcoholics can achieve sobriety by making "a decision to turn our will and our lives over to the care of God as we understand him." Seven of the twelve steps mention God or spirituality, which seems odd for a program founded by a onetime agnostic who, throughout his life, was openly hostile toward organized religion. AA meetings don't have a prescribed schedule or curriculum. Rather, they usually begin with a member telling his or her story, after which other people can chime in. There are no professionals who guide conversations and few rules about how meetings are supposed to function. In the past five decades, as almost every aspect of psychiatry and addiction research, has been revolutionized by discoveries in behavioral sciences, pharmacology and our understanding of the brain, AA has remained frozen in time.

Because of the program's lack of rigor, academics and researchers have often criticized it. AA's emphasis on spirituality, some claimed, made it more like a cult than a treatment. In the past fifteen years, however, a reevaluation has begun. Researchers now say the program's methods offer valuable lessons. Faculty at Harvard, Yale, the University of Chicago, the University of New Mexico, and dozens of other research centers have found a kind of science within. Their findings endorse the Golden Rule of habit change: AA succeeds because it helps alcoholics use the same cues, and get the same reward, but it shifts the routine. Researchers say that AA works because the program forces people to identify the cues and rewards that encourage their alcoholic habits, and then helps them find new behaviors.

Take steps four (to make "a searching and fearless inventory of ourselves") and five (to admit "to God, to ourselves, and to another human being the exact nature of our wrongs").

"It's not obvious from the way they're written, but to complete those steps, someone has to create a list of all the triggers for their alcoholic urges," said J. Scott Tonigan, a researcher at the University of New Mexico who has studied AA for more than a decade. "When you make a self-inventory, you're figuring out all the things that make you drink. And admitting to someone else all the bad things

you've done is a pretty good way of figuring out the moments where everything spiraled out of control."

Then, AA asks alcoholics to search for the rewards they get from alcohol. What cravings, the program asks, are driving your habit loop? Often, intoxication itself doesn't make the list. Alcoholics crave a drink because it offers escape, relaxation, companionship, the blunting of anxieties, and an opportunity for emotional release. They might crave a cocktail to forget their worries. But they don't necessarily crave feeling drunk. The physical effects of alcohol are often one of the least rewarding parts of drinking for addicts.

"There is a hedonistic element to alcohol," said Ulf Mueller, a German neurologist who has studied brain activity among alcoholics. "But people also use alcohol because they want to forget something or to satisfy other cravings, and these relief cravings occur in totally different parts of the brain than the craving for physical pleasure."

In order to offer alcoholics the same rewards they get at a bar, AA has built a system of meetings and companionship - the "sponsor" each member works with - that strives to offer as much escape, distraction and catharsis as a Friday night bender. If someone needs relief they can get it from talking to their sponsor or attending a group gathering, rather than toasting a drinking buddy.

"AA forces you to create new routines for what to do each night instead of drinking," said Tonigan. "You can relax and talk through your anxieties at the meetings. The triggers and payoffs stay the same, it's just the behavior that changes."

One particularly dramatic demonstration of how alcoholics' cues and rewards can be transferred to new routines occurred in 2007 when Mueller, the German neurologist, and his colleagues at the University of Magdeburg implanted small electrical devices inside the brains of five alcoholics who had repeatedly tried to give up booze. The alcoholics in the study had each spent at least six months in rehab without success. One of them had been through detox more than sixty times.

The devices implanted in the men's heads were positioned inside their basal ganglia - the same part of the brain where the MIT researchers found the habit loop - and emitted an electrical charge that interrupted the neurological reward that triggers habitual cravings. After the men recovered from the operations, they were exposed to cues that had once triggered alcoholic urges, such as photos of beer or trips to a bar. Normally, it would have been impossible for them to resist a drink. But the devices inside their brains “overrode” each man's neurological cravings. They didn’t touch a drop.

"One of them told me the craving disappeared as soon as we turned the electricity on," Mueller said. “Then we turned it off and the craving came back immediately."

Eradicating the alcoholics' neurological cravings, however, wasn’t enough to stop their drinking habits. Four of them relapsed soon after the surgery, usually after a stressful event. They picked up a bottle because that's how they automatically dealt with anxiety. However, once they learned alternate routines for dealing with stress, the drinking stopped for good. One patient, for instance, attended AA meetings. Others went to therapy. And once they incorporated those new routines for coping with stress and anxiety into their lives, the successes were dramatic. The man who had gone to detox sixty times never had another drink. Two other patients had started drinking at twelve, were alcoholics by eighteen, drank every day, and now have been sober for four years.

Notice how closely this study hews to the Golden Rule of habit change: Even when alcoholics' brains were changed through surgery, it wasn’t enough. The old cues and cravings for rewards were still there, waiting to pounce. The alcoholics only permanently changed once they learned new routines that drew on the old triggers and provided a familiar relief. "Some brains are so addicted to alcohol that only surgery can stop it," said Mueller. "But those people also need new ways for dealing with life."

AA provides a similar, though less invasive, system for inserting new routines into old habit loops. As scientists have begun understanding how AA works, they've started applying the program’s methods to other habits, such as two-year-olds' tantrums, sex addiction, and even minor behavioral tics. As AA's methods have spread, they’ve been refined into therapies that can be used to disrupt almost any pattern.

The vital element of belief

At first researchers thought that AA succeeds solely by reprogramming participants’ habits. However, the first cracks in this theory started appearing a little over a decade ago. Researches began finding that habit replacement worked pretty well for many people until the stresses of life – such as finding out your mom has cancer, or your marriage is coming apart – got too high, at which point alcoholics often fell off the wagon. Academics asked why, if habit replacement is so effective, it seemed to fail at such critical moments. And as they dug into alcoholics’ stories to answer that question, they learned that replacement habits only become durable new behaviors when they are accompanied by something else: the element of BELIEF. Those alcoholics who believed that G-d or some higher power had entered their lives were more likely to make it through the stressful periods with their sobriety intact.

Even if you give people better habits, it doesn't repair why they started drinking in the first place. Eventually they'll have a bad day, and no new routine is going to make everything seem okay. What can make a difference is believing that they can cope with that stress without alcohol.

By putting alcoholics in meetings where belief is a given – where, in fact, belief is an integral part of the twelve steps – AA trains people in how to believe in something until they believe in the program and themselves. It lets people practice believing that things will eventually get better, until things actually do. At some point, people in AA look around the room and think, *if it worked for that guy, I guess it can work for me*. There's something really powerful about groups and shared experiences. It seems so much more real when we can see it in other people's eyes.

So what's the magic formula for Habit Change?

(From the appendix to The Power of Habit)

The difficult thing about studying the science of habits is that most people, when they hear about this field of research, want to know the secret formula for quickly changing any habit. If scientists have discovered how these patterns work, then it stands to reason that they must have also found a recipe for rapid change, right?

If only it were that easy.

It's not that formulas don't exist. The problem is that there isn't one formula for changing habits. There are thousands.

Individuals and habits are all different, and so the specifics of diagnosing and changing the patterns in our lives differ from person to person and behavior to behavior. Giving up cigarettes is different than curbing overeating, which is different from changing how you communicate with your spouse, which is different from how you prioritize tasks at work. What's more, each person's habits are driven by different cravings.

As a result, there is no one prescription. Rather, we hope to deliver something else: a framework for understanding how habits work and a guide to experimenting with how they might change. Some habits yield easily to analysis and influence. Others are more complex and obstinate, and require prolonged study. And for others, change is a process that never fully concludes.

But that doesn't mean it can't occur. The framework described in this appendix is an attempt to distill, in a very basic way, the tactics that researchers have found for diagnosing and shaping habits

within our own lives. This isn't meant to be comprehensive. This is merely a practical guide, a place to start.

Change might not be fast and it isn't always easy. But with time and effort, almost any habit can be reshaped.

THE FRAMEWORK:

- **Identify the routine**
- **Experiment with rewards**
- **Isolate the cue**
- **Have a plan**

STEP ONE: IDENTIFY THE ROUTINE

The MIT researchers discovered a simple neurological loop at the core of every habit, a loop that consists of three parts: A cue, a routine and a reward.

To understand your own habits, you need to identify the components of your loops. Once you have diagnosed the habit loop of a particular behavior, you can look for ways to supplant old vices with new routines.

As an example, let's say you have a bad habit, like I did when I started researching this book, of going to the cafeteria and buying a chocolate chip cookie every afternoon. Let's say this habit has caused you to gain a few pounds. In fact, let's say this habit has caused you to gain exactly 8 pounds, and that your wife has made a few pointed comments. You've tried to force yourself to stop – you even went so far as to put a post-it on your computer that reads "NO MORE COOKIES".

But every afternoon you manage to ignore that note, get up, wander towards the cafeteria, buy a cookie and, while chatting with colleagues around the cash register, eat it. It feels good, and then it feels bad. Tomorrow, you promise yourself, you'll muster the willpower to resist. Tomorrow will be different.

But tomorrow, the habit takes hold again.

How do you start diagnosing and then changing this behavior? By figuring out the habit loop. And the first step is to identify the routine. In this cookie scenario – as with most habits – the routine is the most obvious aspect: it's the behavior you want to change. Your routine is that you get up from your desk in the afternoon, walk to the cafeteria, buy a chocolate chip cookie and eat it while chatting with friends. So that's what you put into the loop:

Next, some less obvious questions: What's the cue for this routine? Is it hunger? Boredom? Low blood sugar? That you need a break before plunging into another task?

And what's the reward? The cookie itself? The change of scenery? The temporary distraction? Socializing with colleagues? Or the burst of energy that comes from that blast of sugar?

To figure this out, you'll need to do a little experimentation.

STEP TWO: EXPERIMENT WITH REWARDS

Rewards are powerful because they satisfying cravings. But we're often not conscious of the cravings that drive our behaviors. Most cravings are obvious in retrospect, but incredibly hard to see when we are under their sway.

To figure out which cravings are driving particular habits, it's useful to experiment with different rewards. This might take a few days, or a week, or longer. During that period, you shouldn't feel any pressure to make a real change – think of yourself as a scientist in the data collection stage.

On the first day of your experiment, when you feel the urge to go to the cafeteria and buy a cookie, adjust your routine so it delivers a different reward. For instance, instead of walking to the cafeteria, go outside, walk around the block, and then go back to your desk without eating anything. The next day, go to the cafeteria and buy a donut, or a candy bar, and eat it at your desk. The next day, go to the cafeteria, buy an apple, and eat it while chatting with your friends. Then, try a cup of coffee. Then, instead of going to the cafeteria, walk over to your friend's office and gossip for a few minutes and go back to your desk.

You get the idea. What you choose to do *instead* of buying a cookie isn't important. The point is to test different hypotheses to determine which craving is driving your routine. Are you craving the cookie itself, or a break from work? If it's the cookie, is it because you're hungry? (In which case the apple should work just as well.) Or is it because you want the burst of energy the cookie provides? (And so the coffee should suffice.) Or, are you wandering up to the cafeteria as an excuse to socialize, and the cookie is just a convenient excuse? (If so, walking to someone's desk and gossiping for a few minutes should satisfy the urge.)

As you test four or five different rewards, you can use an old trick to look for patterns: After each activity, jot down on a piece of paper the first three things that come to mind when you get back to your desk. They can be emotions, random thoughts, reflections on how you're feeling, or just the first three words that pop into your head.

Then, set an alarm on your watch or computer for 15 minutes. When it goes off, ask yourself: do you still feel the urge for that cookie?

The reason why it's important to write down three things – even if they are meaningless words – is twofold. First, it forces a momentary awareness of what you are thinking or feeling. Just as Mandy, the nail biter in Chapter 3, carried around a note card filled with hash marks to force her into awareness of her habitual urges, so writing three words forces a moment of attention. What's more, studies show that writing down a few words helps in later recalling what you were thinking at that moment. At the end of the experiment, when you review your notes, it will be much easier to remember what you were thinking and feeling at that precise instant, because your scribbled words will trigger a wave of recollection.

And why the 15-minute alarm? Because the point of these tests is to determine the reward you're craving. If, fifteen minutes after eating a donuts, you *still* feel an urge to get up and go to the cafeteria, then your habit isn't motivated by a sugar craving. If, after gossiping at a colleague's desk, you still want a cookie, then the need for human contact isn't what's driving your behavior.

On the other hand, if fifteen minutes after chatting with a friend, you find it easy to get back to work, then you've identified the reward – temporary distraction and socialization – that your habit sought to satisfy.

By experimenting with different rewards, you can isolate what you are *actually* craving, which is essential in redesigning the habit.

Once you've figured out the routine and the reward, what remains is identifying the cue.

STEP THREE: ISOLATE THE CUE

The reason why it is so hard to identify the cues that trigger our habits is because there is too much information bombarding us as our behaviors unfold. Ask yourself, do you eat breakfast at a certain time each day because you are hungry? Or because the clock says 7:30? Or because your kids have started eating? Or because you're dressed, and that's when the breakfast habit kicks in?

When you automatically turn your car left while driving to work, what triggers that behavior? A street sign? A particular tree? The knowledge that this is, in fact, the correct route? All of them together? When you're driving your kid to school, and you find that you've absentmindedly started taking the route to work – rather than to the school – what caused the mistake? What was the cue that caused the 'drive to work' habit to kick in, rather than the 'drive to school' pattern?

To identify a cue amid the noise, we can use the same system as the psychologist: Identify categories of behaviors ahead of time to scrutinize in order to see patterns. Luckily, science offers some help in this regard. Experiments have shown that almost all habitual cues fit into one of five categories:

- *Location*
- *Time*
- *Emotional State*
- *Other People*
- *Immediately preceding action*

So, if you're trying to figure out the cue for the 'going to the cafeteria and buying a chocolate chip cookie' habit, you write down five things the moment the urge hits (these are my actual notes from when I was trying to diagnose my habit):

Day 1:

- *Where are you?* (sitting at my desk)
- *What time is it?* (3:36 pm)
- *What's your emotional state?* (bored)
- *Who else is around?* (no one)
- *What action preceded the urge?* (answered an email)

The next day:

- Where are you? (walking back from the copier)
- What time is it? (3:18 pm)
- What's your emotional state? (happy)
- Who else is around? (Jim from Sports)
- What action preceded the urge? (made a photocopy)

The third day:

- *Where are you?* (conference room)
- *What time is it?* (3:41 pm)
- *What's your emotional state?* (tired, excited about the project I'm working on)
- *Who else is around?* (editors who are coming to this meeting)
- *What action preceded the urge?* (I sat down because the meeting is about to start)

Three days in, it was pretty clear which cue was triggering my cookie habit – I felt an urge to get a snack at a certain time of day. I had already figured out, in step two, that it wasn't hunger driving my

behavior. The reward I was seeking was a temporary distraction – the kind that comes from gossiping with a friend. And the habit, I now knew, was triggered between 3:00 and 4:00.

STEP FOUR: HAVE A PLAN

Once you've figured out your habit loop – you've identified the reward driving your behavior, the cue triggering it, and the routine itself – you can begin to shift the behavior. You can change to a better routine by planning for the cue, and choosing a behavior that delivers the reward you are craving. What you need is a plan.

In the prologue, we learned that a habit is a choice that we deliberately make at some point, and then stop thinking about, but continue doing, often every day.

Put another way, a habit is a formula our brain automatically follows: When I see CUE, I will do ROUTINE in order to get a REWARD.

To re-engineer that formula, we need to begin making choices again. And the easiest way to do this, according to study after study, is to have a plan. Within psychology, these plans are known as 'implementation intentions.'

Take, for instance, my cookie-in-the-afternoon habit. By using this framework, I learned that my cue was roughly3:30in the afternoon. I knew that my routine was to go to the cafeteria, buy a cookie and chat with friends. And, through experimentation, I had learned that it wasn't really the cookie I craved – rather, it was a moment of distraction and the opportunity to socialize.

So, I wrote a plan:

At 3:30, every day, I will walk to a friend's desk and talk for 10 minutes.

To make sure I remembered to do this, I set the alarm on my watch for3:30.

It didn't work immediately. There were some days I was too busy and ignored the alarm, and then fell off the wagon. Other times it seemed like too much work to find a friend willing to chat – it was easier to get a cookie, and so I gave in to the urge. But on those day that I abided by my plan – when my alarm went off, I forced myself to walk to a friend's desk and chat for 10 minutes – I found that I ended the workday feeling better. I hadn't gone to the cafeteria, I hadn't eat a cookie, and I felt fine. Eventually, it got be automatic: when the alarm rang, I found a friend, and ended the day feeling a small, but real, sense of accomplishment. After a few weeks, I hardly thought about the routine

anymore. And when I couldn't find anyone to chat with, I went to the cafeteria and bought tea and drank it with friends.

That all happened about six months ago. I don't have my watch anymore – I lost it at some point. But at about3:30every day, I absentmindedly stand up, look around the newsroom for someone to talk to, spend 10 minutes gossiping about the news, and then go back to my desk. It occurs almost without me thinking about it. It has become a habit.

Obviously, changing some habits can be more difficult. But this framework is a place to start. Sometimes change takes a long time. Sometimes it requires repeated experiments and failures. But once you understand how a habit operates – once you diagnose the cue, the routine and the reward – you gain power over it.

In closing: How can we apply all the lessons above to lust addiction?

Scientists have studied the brains of alcoholics, smokers and over-eaters and have measured how their neurology – the structures of their brains and the flow of neurochemicals inside their skulls – changes as their cravings became ingrained. Particularly strong habits seem to produce addiction-like reactions so that wanting evolves into obsessive craving that can force our brains into auto-pilot, even in the face of strong disincentives, including loss of reputation, job, home and family.

A porn addiction often becomes a person's source for escape, comfort, and focus, so it cannot simply be stopped, leaving huge gaps in all of those areas, without being replaced by something else. Regular porn usage changes the chemistry of the brain by requiring more and more of the feel-good chemicals, dopamine, to be released to feel the same level of excitement as when the user first viewed porn (Porn Changes the Brain, n.d., and Hilton, D., & Watts, C., 2011). When kicking a porn addition, the brain must rebalance itself to return to a normal release of pleasure chemicals. Creating new habits is crucial in this rewiring of the brain.

The first step is to recognize which cravings are driving the behavior. AA and other 12-Step groups have identified certain triggers which are the main causes of the addict launching into his addictive routine.

TRIGGERS:

R.I.D = Restlessness, Irritability, Discontent

R.I.D is usually caused by: H.A.L.T = Hungry, Angry, Lonely or Tired

Stress and boredom are also common triggers.

Once we recognize the cues and triggers, we need to identify the rewards that we have come to anticipate, which fuel the habit loop:

The rewards from the addictive acting-out are usually C.A.P = Control, Alive, Pleasure.

CONTROL: When the world feels overwhelming and out of control, the self-soothing addictive behaviors put us back into the “driver’s seat” and make us feel in control again.

ALIVE: When we feel apathetic, lazy and dead inside, the fast pulse and the high of the chemical releases that the acting-out brings makes us feel alive (much like the reason some people like riding roller-coasters).

PLEASURE: The self-soothing / self-medicating behavior brings us pleasure, which solidifies the reward circuitry in our brains, ingraining the routine into a powerful habit.

With the recognition of the triggers and rewards, we can work on attacking the various elements of the habit loop:

Removing Triggers

When triggered by R.I.D, we can learn to change the routine of acting out and instead train ourselves to do another action that brings similar feelings.

Firstly, since R.I.D is usually triggered by H.A.L.T, we need to make sure that we aren’t hungry, angry, lonely or tired.

Also, although the world is full of triggers, we still need to try and remove the obvious triggers as much as possible. It’s easy to associate habits with the times and places where they are used, so removing those triggers is essential. If you find yourself watching porn in the privacy of your room, remove internet-enabled devices from your room. Be sure to make all internet-enabled devices safe by placing filters on them to block pornographic content.

Changing the Routine

When feeling weak, we need to experiment with various alternate routines to discover what the triggers are and what the particular rewards are that the brain is seeking through acting out. Over

time, we can retrain ourselves to rely on new activities and coping methods rather than the old destructive, addictive ones. As soon as the craving hits, we will redirect our focus to a new routine.

For starters, we can try some easy routine replacements and see if those help. For example, try taking a snack instead of acting out. Perhaps the trigger was caused by hunger, or perhaps the body craves a rush, which sugar or a coffee can provide. Another time you feel weak, try taking a nap instead of acting out. Perhaps the trigger was caused by tiredness or stress and your brain just craves a shut-down and reboot.

Another great routine that can often replace the acting-out is a session of physical activity. The pornography habit of watching, masturbating, and reaching orgasm is physical, so a replacement should be a short physical exercise. When feeling triggered, we can train ourselves to put off the acting-out until we first go for a 30 minute walk, or even just a ten minute run. Look also into Yoga, Pilates, running, weightlifting, or martial arts. The adrenaline boost of exercise has been shown to be a great replacement for the chemical rush that our brains have come to crave through the lustful behaviors. Although intense exercise may not feel good to those unaccustomed to it, according to a recent study, it does have at least one great perk: the runner's high, which is a feeling of relaxed euphoria, which sets in at the end of long bouts of activity. The study shows that exercise causes the body to produce a particular neurotransmitter that makes the body relaxed—the same one trigged by smoking marijuana or other addictive behaviors.

If the trigger is boredom, we can try to create new, healthy internet habits that will enhance our lives, such as researching a favorite subject or learning how to make something we are interested in. We can also try to reconnect with old interests. It's likely that we have been consumed by our pornography habit to the exclusion of many, if not all, previously enjoyable activities. Try to re-establish activity in things we used to love, whether it's a sports, reading, learning, whatever used to spark our interest and passion. As we re-establish this connection, we will also tap back into liking ourselves, a sense of accomplishment, and healthy self-worth.

The opposite of addiction is CONNECTION

A recent study has shown that the opposite of addiction is not sobriety but rather CONNECTION (watch this video for a 5 minute overview of this enlightening study). So if the suggested routines mentioned above don't do the trick, it is likely that loneliness and isolation are the triggers and the brain is craving a "connection" reward. A porn addiction removes us from natural interactions with others and replaces it with intense, hyper stimulated responses to objectified people, giving us the illusion of connection. Recovering addicts need to re-learn how to be with real people in real, normal

circumstances. Even if it feels like an enormous effort, socializing will help us regain a normal sense of people and relationships. So next time you feel triggered, get up and connect with some friends or go hug your kids and have a conversation with your wife.

On a similar note, one of the most common actions used in 12-Step groups to replace the acting-out routine is to pick up the phone to another member of the program and share our feelings. The rush of energy it takes to make the call and the connection we feel while on the call, etc. can replace the rewards that we have come to rely on by making us feel once again worthy, hopeful, alive, and most of all –**connected**. Experience has shown that members who have trained themselves to habitually "pick up the phone" every time they feel triggered have the highest rate of success. Instead of the illusion of connection with the images on the screen, we replace it with the real connection of another human being who understand us and reassure us that "it will be okay". Over-time, the bad habit is simply replaced by this new routines. Instead of **acting-out**, we **reach out**.

The triggers may always remain the same, but as described in all the examples above (snack, nap, exercise, hobbies and connection) we can learn to replace the reward we crave with something else - something far more meaningful, and thus enable ourselves to change the **routine**.

The Group Aspect

And lastly, our odds of success go up dramatically when we commit to changing as **part of a group**. This is because, as explained earlier, **"belief"** is at the core of modifying many habit loops and plays a critical role in habit change. For change to be permanent, people **must believe change is possible** and that things will get better. And studies have shown that the strongest belief is born out of group support. Groups have a powerful effect on belief by providing shared experiences and opportunities for people to publicly commit to change.

To sum up this entire series:

If you want to change a habit, it usually helps to recognize the cue ("I always want to act-out when I feel stressed"), deliver the expected reward ("I feel more relaxed around friends"), but find an alternative routine ("Instead of looking at porn, I'll go to a 12-Step meeting"). And with the belief in a higher power and the power of the group, we learn to really believe that change is **possible**.