First Unitarian Universalist Society of Albany, 405 Washington Ave. Albany, NY 12206

9.29.13 Sermon: "Liberating Habits"

Presenter: Rev. Sam Trumbore

Good habits guide us away from trouble. Bad habits get us into trouble. No surprise here.

The surprise is how hard it can be to undo bad habits and create good ones … unless we understand how the habit formation process works in our brains. Changing bad habits and creating good ones is much easier than you might think once you know how.

Rats and people form habits in similar ways. Researchers at the Brain and Cognitive Sciences department of the Massachusetts Institute of Technology have done some ground breaking work measuring the brain activity of rats running mazes. They put a rat in a T shaped maze, at the base of the T, and let it explore. On the hidden left side of the T, there was a piece of chocolate. The rat could smell the chocolate but couldn't see it. The rat got very excited moving round sniffing and seeking the chocolate. Researchers measured a lot of activity in the rat's brain as it searched. Finally it found the chocolate through a random search. Very quickly the rat learned to run to the end of the T and turn left to get its reward. What was interesting to the researchers was the steep decrease in brain activity. The rat stopped thinking and just reflexively ran through the maze. How different are we when passing a cookie on a plate, or drive past a Starbucks or McDonald's and automatically pick up the cookie or turn into the pickup lane for something to eat or drink?

Brains are energy hogs, more than any other organ, using up to 20% of the available fuel. Habits reduce our brain's energy consumption … and can save our skin. I wouldn't want to be thinking too hard about what to do when a tiger appears out of the jungle and starts sniffing my scent. I'd want my plan already programmed in my head. Soldiers drill their routines over and over to make them automatic. Hear a loud sound or see a flash, don't think about it, drop to the ground immediately.

Imagine if we had to figure out each morning how to stand up, put our clothes on, brush our teeth, make breakfast, and all our other routine tasks as if we'd never done them before. We'd be exhausted before starting our day. Habits have been critical to our survival as a species … but also a source of a lot of problems.

Dr. Wolfram Schultz, a professor of neuroscience at the University of Cambridge, does research with monkeys. He wanted to understand what happens inside their brains during the habit formation process. His subject for this experiment was an eight pound macaque named Julio.

He inserted a very thin electrode in his brain that allowed him to observe neuronal activity as it occurred. Then he put Julio down in front of a computer monitor. When yellow spirals, red squiggles and blue lines appeared on the screen AND Julio touched a lever at the same time a drop of blackberry juice came down a tube near his lips.

Julio really, really, liked blackberry juice.

At first he didn't recognize the connection and was restless. It didn't take him long to make the association between seeing the shapes, touching the lever and the reward. Once he figured it out, he stared intently at the screen without moving. As soon as he saw one of the colored shapes appear, he pushed the lever, got his reward and smacked his lips contentedly. Dr. Schultz measured a spike on his instruments of neuronal activity he associated with Julio's pleasure sipping the blackberry juice. Julio had formed a strong habit pattern.

Dr. Schultz didn't let poor Julio just play with the lever and get his reward. He sometimes didn't give him any blackberry juice when he pushed the lever. This made Julio agitated and angry. What Dr. Schultz measured on his instruments was even more interesting. The more Julio repeated the habit, the spike of neuronal activity moved forward from receiving the juice to seeing the shape on the screen even before pulling the lever.

When Julio anticipated juice but didn't receive it, a neurological pattern associated with desire and frustration erupted inside his skull. When Julio saw the cue, he started anticipating a juice-fueled joy. But if the juice didn't arrive, that joy became a craving that, if unsatisfied, drove Julio to anger or depression. (Duhigg p. 47)

Combine craving with habit's non-thinking, automatic quality and we start to get a sense of how powerful habits can become. Habits don't sit in our minds like a computer program that can be easily erased by flipping a switch. Habits are laid down as synaptic connections. Once they are made, they are there for the rest of our lives. Rats, taught to run a maze will remember how to run it for the rest of its life.

That's the bad news about habits. They are permanently wired into our brains and cannot be removed. They can however be changed.

To understand how, we need to better understand cues, behaviors and rewards, the three elements of a habit.

Habits begin with cues, something that triggers them. Cues predominately come from one of five sources:

a location
a time of day
the arising of an emotion or urge
an interaction with another person or
An action or sensation that precedes the habit starting.

These can be identified by asking five questions about a habit activation.

Let's say you have an urge to buy a soda, a common habit. Ask:

Where are you? (sitting at my desk)
What time is it? (3: 36 P.M.)
What's your emotional state? (bored)

Who else is around? (no one)
What action preceded the urge? (answered an email)

If you were to do this over several days, you'd find variation in all but the primary driving cue for the habit that would be unique for each person.

The cue initiates a sequence of behaviors that stimulate a reward, some positive affect that motivates the behavior. Like the cue, the reward may not be obvious. The reward that is sought may not be sweetness of a Coke. It might be the caffeine lift. It could be the stimulation of the bubbles. It could be the exercise of walking. It could be passing an attractive person's desk and stopping to chat.

To modify a habit, it is critical to understand both the cue and the reward.

Now, for the hard truth about habits. Because of the physical mapping in the brain of cues to rewards, they can't be removed. We can't forget them. The cues and the rewards remain intertwined for the rest of our lives. This is sobering to reflect on as we consider initiating or repeating unhealthy behavior patterns. On the other hand, initiating and reinforcing healthy behavior patterns can program them into our brains. (This is a great gift to our children, establishing life affirming habits that will stay with them for the rest of their lives.)

What we can do is substitute a new pathway between the cue and reward that is far less destructive and far more healthy.

That's what Mandy did to solve her nail biting problem. And a big problem it was. She nibbled on her finger tips so much, she had scabs all over them. Those scabs caused her to walk around with her hands in her pockets so no one would see them. Embarrassment about the appearance of her fingers with missing nails interfered with her dating and spending time with her friends,. Yet she just could not stop the nasty habit she had repeated daily since childhood. Finally she broke down and sought a therapist skilled in habit reversal training for help.

First the therapist helped her identify the cue that triggered the habit. She would run her thumb along the surface of her nails. If it caught or she felt some tension, into the mouth they went. Mandy was surprised by the cue question because she hadn't even considered that there was a cue for the habit. She was only aware of the habit when it was already well underway.

Mandy was also unaware of the reward she was getting from causing herself all this discomfort. After considering several different alternatives, she finally landed on the sense of completion she experienced after biting all her fingernails.

The next step was to make her aware of when she felt the cue. The therapist gave her an index card and asked her to put a check on it when she felt the urge. She came back the next week having checked the card 28 times. But something had changed already. She had only chewed her nails three times that week. Her awareness of the cue had given her a new option. But that wasn't quite enough.

Now the therapist introduced a new behavior for her to do when she felt the cue.

Whenever she felt that tension in her fingertips, he told her, she should immediately put her hands in her pockets or under her legs, or grip a pencil or something else that made it impossible to put her fingers in her mouth. Then Mandy was to search for something that would provide a quick physical stimulation— such as rubbing her arm or rapping her knuckles on a desk— anything that would produce a physical response. (Duhigg p76)

After a few weeks, the nail biting habit, one that had tormented her for years, was gone.

Nathan Azrin, one of the developers of habit reversal training says:

"It seems ridiculously simple, but once you're aware of how your habit works, once you recognize the cues and rewards, you're halfway to changing it. It seems like it should be more complex. The truth is, the brain can be reprogrammed. You just have to be deliberate about it." (Duhigg pp. 76)

This is good news that can give us hope. Hope that we can change our habits if we understand our cues and rewards then rewire them with new behaviors.

But it doesn't always work since the old habit is still there along with the new one. Sometimes those habits revisit us when we are under stress.

The most heartbreaking for me are cases of addiction relapse. An alcoholic has been in recovery for years, hasn't touched a drop, then has an emotional crisis. A beloved relative or pet dies, a relationship breaks up, a job is lost and all of a sudden the old urge takes over. The patterns of behavior are right there in the brain waiting to be reactivated by an unanticipated cue. It's why in Alcoholics Anonymous, the expression, once a drunk, always a drunk lines up with what we know about habit formation. The patterns don't go away even if new patterns are added. The risk of relapse cannot be eliminated.

But some people under stress do not relapse. One critically important factor in preventing relapse is belief.

Is it belief in God? Not necessarily. There are plenty of devout believers in church who are active alcoholics and drug users. Not a few priests who serve communion become dependent on the sacramental wine outside celebrating the Eucharist.

The concept that AA uses of the Higher Power points to something outside the self. My favorite higher power that worked for one fellow was a bed pan. He chose his bed pan as his higher power, worked with it, and it worked for him.

The key insight of belief in a higher power is the process of believing itself. Firm belief that somewhere, somehow, there is some resource that is dependable and not self-created or controlled that can be called upon in a crisis to help, does make a difference.

Is it God in disguise? Is it the Spirit of Life? Is it the Power of Creative Imagination? What the alcoholic discovers, and usually discovers in a crisis situation, is that the process of having a belief is enough to not drink for one more day. And that is sufficient.

J. Scott Tonigan, a researcher at the University of New Mexico who has studied AA for over a decade said:

"I wouldn't have said this a year ago— that's how fast our understanding is changing—but belief seems critical. You don't have to believe in God, but you do need the capacity to believe that things will get better. "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." (Duhigg p.85)

So if we want to be free of bad habits and develop good habits we need both determination and we need faith. One or the other is not quite enough. Enduring change requires effort and the confidence there are resources that we can rely on to see us through.

May we seek those resources as we strive to bring peace to our troublesome habits and to our troubled world.