

Executive Function Fatigue



Video @ <https://vimeo.com/540290544> (less than 1 minute)

Neuroscientist Marc Lewis

Let's consider three points about why it is so hard to quit an addiction. The first one, is that addiction is based on a strong attraction to something, to a substance, or a behavior, which is repeated many times and which leads to deep learning or accelerated learning. That's the first point. The second point is this mechanism called "now appeal" or "delay discounting", which I'll talk about. Then last is something called "ego fatigue," executive function fatigue, or "ego depletion", which is basically the loss of self-control. If you try too hard to control things, you actually lose the capacity to do so efficiently.

The using part that leads to Executive Function Fatigue:

Neuroscientist Marc Lewis

Video @ <https://vimeo.com/540297749> (less than 2 minutes)

Addiction is an Intensively learned habit. Let's trace this feedback cycle and show you how it plays out over development. There's the trigger, the cue, leads to craving. Craving leads to imagining. Imagining leads back to, well let's just say, more perception of the intended activity and that's an intensification cycle and it goes on for a while. And finally, when it gets intense enough, you go get some and you do some. That's the using part that leads to Executive Function Fatigue.

The relapse effects that lead to Executive Function Fatigue:

When you get high or whatever, get drunk, what does that do? It has three effects. The first effect is relief, relief for pleasure. In learning theory that's just positive reinforcement. It reinforces the behavior and trenches it further. So that's learning, and then comes loss. Then the cycle repeats itself, like I just said, so you get relief, learning, and loss and then you do it again.

The brain's biological functions that lead to Executive Function Fatigue:

Now, think about every time this cycle goes, every time you go through this cycle in your mind and your brain, what you're doing is activating particular synapses in a particular synaptic configuration that you've been building up over occasions. Maybe weeks, months, or years, whatever it is, and you're reinforcing the synaptic connections. Every time, you're reinforcing the synaptic connections. You're reinforcing, which means you are developing some synapses and you're pruning the synapses that aren't involved. And so, you are actually sculpting and consolidating the synaptic configuration that makes you an addict. So, you do that time after

time, day after day, week after week, month after month, and that's development. That's the development of a habit, a very intense habit. An emotional habit. A strongly compelling habit, but it is still a habit. It's a learned habit.

Executive Function fatigue is why it's so hard to quit an addiction!

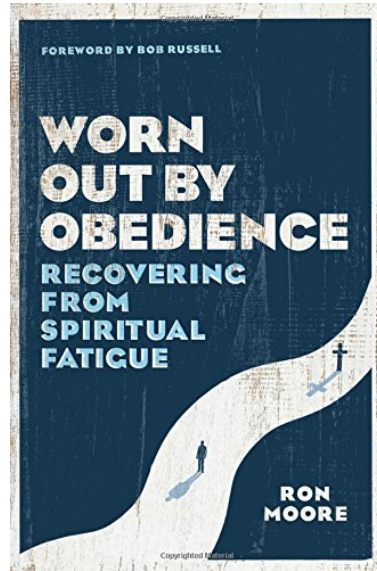
Neuroscientist Marc Lewis

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Executive Function Fatigue is why it is so hard to quit an addiction! The point is that you can't keep trying not to do something, that's the point. You can't keep trying to suppress an immediate impulse. It's like holding your arm out to the side. You can do it for 5 minutes. Try doing it for an hour. Machinery isn't built for that. Okay, it's not built for that. So, addicts have a really hard time with that. An extremely hard time because they have to suppress, control, inhibit their impulses, for hours at a time, days at a time, weeks at a time. They're told in their AA group, you can never drink again. And they're told that their addiction is doing push-ups in the parking lot and you'll have to be under guard all the time and that's really, really difficult. It's so difficult that most of them fail and the success rate in AA is five to eight percent. So, of course, one of the problems is, there are cues everywhere. Especially with alcohol, it's particularly difficult, also is smoking and the cues are all around us. So, it continues to turn on the dopamine system, focus your attention on the anticipated reward, and then you have to say "No, I'm not doing that."

Summary of Executive Function Fatigue development:

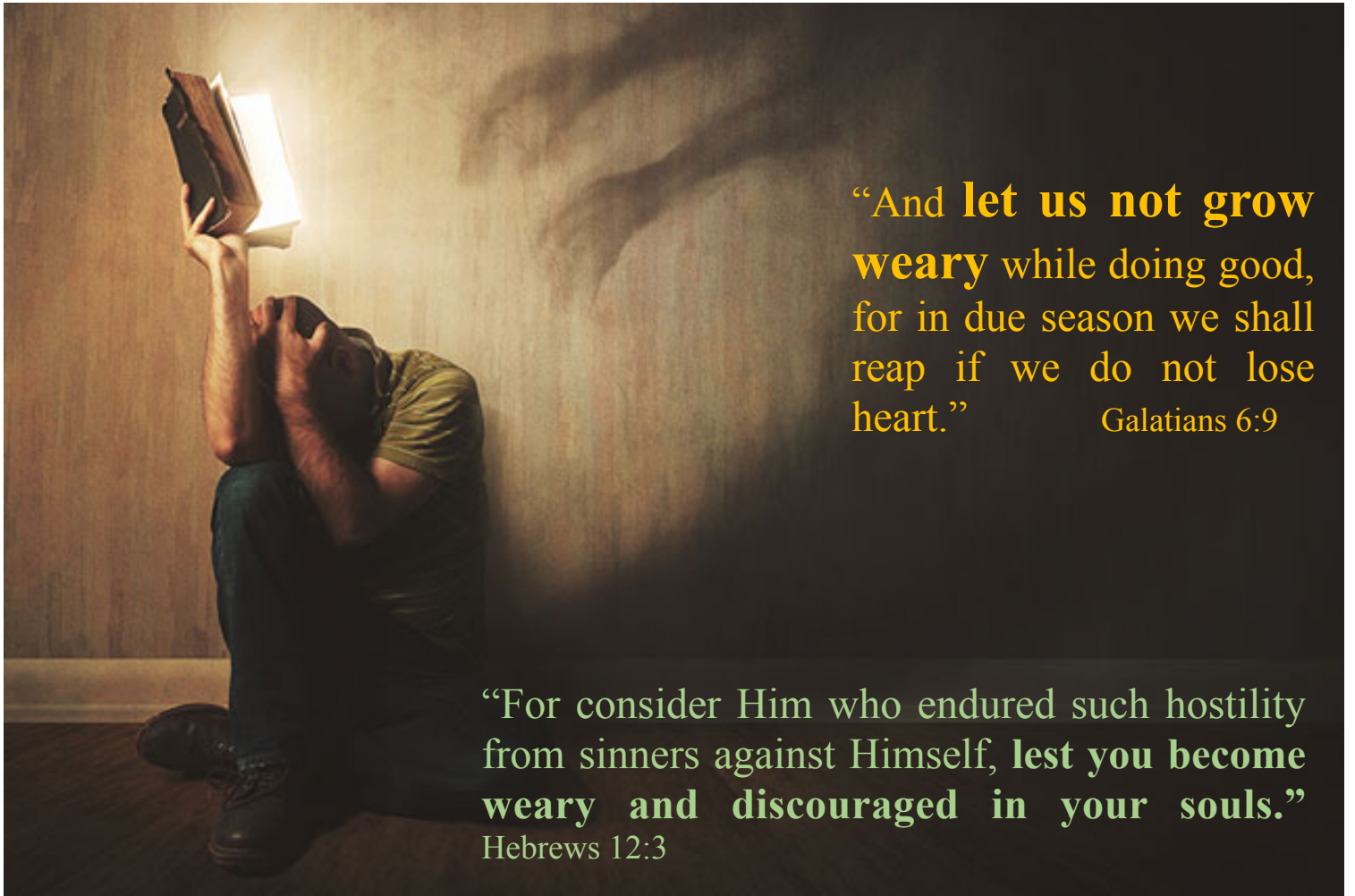


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Neuroscientist Marc Lewis

Here's the PFC (prefrontal cortex) in charge of judgment. Here's the striatum, in charge of attraction, desire, craving. And here is the dopamine system. And dopamine goes to the striatum and sets up that little feedback cycle so you get more and more and more. And then the striatum becomes sort of hyper-activated in the presence of cues. And then you get that mechanism of "now appeal". That's narrowing of attraction to the immediate reward and the loss of everything else. The other stuff falls off the radar, okay? And then the connection between the PFC and the striatum starts to become compromised. You get ego fatigue, and the prefrontal cortex simply becomes less, efficient less effective at control.

The following passages are Neurospiritual Scriptures on Executive Function Fatigue:



“And **let us not grow weary** while doing good, for in due season we shall reap if we do not lose heart.” Galatians 6:9

“For consider Him who endured such hostility from sinners against Himself, **lest you become weary and discouraged in your souls.**” Hebrews 12:3



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Test with Answers

Name the four steps in the addiction cycle that lead to Executive Function Fatigue:

1. **The trigger** leads to craving
2. **The craving** leads to imagining the intended activity
3. **The imagining** intensifies until you get high, drunk, whatever.
4. **Relapse** which provides relief

Explain what is going on biologically in the brain after years of triggers, craving, imagining, and relapsing:

Every time you go through this cycle (Trigger, Craving, Imagining, Relapse) in your mind and your brain, what you're doing is activating particular synapses in a particular synaptic configuration that you've been building up over occasions. Maybe weeks, months, or years, whatever it is, and you're reinforcing the synaptic connections. This means you are developing some synapses and you're pruning the synapses that aren't involved. And so, you are actually sculpting and consolidating the synaptic configuration that makes you an addict. This is the development of an intensely learned habit that is very hard to quit!

Explain what is going on biologically (prefrontal cortex, dopamine, Striatum) that leads to executive function fatigue:

Here's the prefrontal cortex (PFC) in charge of judgment. Here's the striatum (nucleus accumbens), in charge of attraction, desire and craving. And here is the dopamine system. And dopamine goes to the striatum & nucleus accumbens and sets up that little feedback cycle so you get more and more and more. And then the striatum becomes sort of hyperactivated in the presence of cues. And then you

get that mechanism of “now appeal”. That’s narrowing of attraction to the immediate reward and the loss of everything else. The other stuff falls off the radar, okay? And then the connection between the PFC and the striatum starts to become compromised. You get ego fatigue and the prefrontal cortex simply becomes less, efficient less effective at control.

Explain why these two Scriptures apply to Executive Function Fatigue:

“And let us not grow weary while doing good, for in due season we shall reap if we do not lose heart.” Galatians 6:9

“For consider Him who endured such hostility from sinners against Himself, lest you become weary and discouraged in your souls.” Hebrews 12:3

“Let us not grow weary” and “lest you become weary and discouraged in your souls” refer to being mentally, emotionally and spiritually tired to the point of quitting.