

Slide 1

REWARD-BASED LEARNING & RECOVERY

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1

Slide 2

Reward-based Learning & Recovery

Recovery is:
Rewiring your brain.

The Craving Mind: From Cigarettes to Smartphones to Love—Why We Get Hooked and How We Can Break Bad Habits Judson Brewer and Jon Kabat-Zinn Ph.D.



Slide 3

Reward-based Learning & Recovery

We are reward seeking machines.



Slide 4

Reward-based Learning & Recovery

The reward system exists to get us to seek what we need.
It alerts us to the sights, sounds, and scents that point us to the reward.
It operates in the realm of instinct and reflex.

<https://www.yourbrainonporn.com/brain-science-unlocking-addiction-addiction-national-geographic>

Pleasure Center

Slide 5

Addiction Hijacks the Brain

Activation of the reward pathway by addictive drugs

Slide 6

Addiction Hijacks the Brain

How?
First:
"Phasic firing" — Doesn't happen all the time
"This is where the magic happens!"

I love it!
I've got to have it!

Pleasure Center

Slide 7

Slide 7 content: **Addiction Hijacks the Brain**. Text: "Second, we identify: 'Stimuli' – What we call: Triggers That Predict Rewards". Includes a small image of a turkey and a diagram titled "Activation of the reward pathway by addictive drugs" showing brain regions like the nucleus accumbens and striatum.

Slide 8


Slide 8 content: **Happiness vs. Pleasure**. Text: "Somewhere in human history, we were conditioned to think that the feeling we get when dopamine fires in our brain = HAPPINESS! ... this was probably set up so that we would remember where food could be found, not to give us the feeling 'you are now fulfilled!'". Includes a brain diagram and a silhouette of runners.

Slide 9

Slide 9 content: **Addiction Hijacks the Brain**. Text: "Phasic Firing Decreases Because the Brain Knows it Works – Becomes a low level of Continuous firing when a reward is received. Tolerance". Includes a small image of a turkey and a diagram titled "Activation of the reward pathway by addictive drugs" showing brain regions like the nucleus accumbens and striatum.

Slide 10



Triggers Cause Craving
Comes up from the limbic brain with speed and force.



Slide 11

Reward-based Learning
The Low Road


- The Limbic System along w/the "reptilian," automatic brain responses comprise the FAST MOVING, LOW-ROAD of the brain.
- The "GO" part of the brain



Slide 12

Reward-based Learning
The Low Road

- It's called System 1 or the Default Mode Network (DMN)
- When the low road is leading the way.




Slide 13

Reward-based Learning

System 1

- When we're in System 1 the cortex translates the "Low Road/The Go Brain" to:
- "I want:" craving, impulses, and gut instincts (instant impressions).
- The "Me" Channel!
 - It's all about me,
 - All the time!

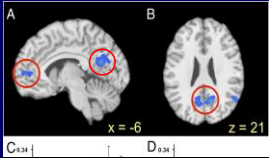


Slide 14

Reward-based Learning

System 1/DMN

- System 1 in the Cortex:


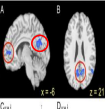


Slide 15

Reward-based Learning

The "Me Channel"

- Default Mode Network
- "This just in . . ."




Slide 19

Reward-based Learning

System 2: The High Road

- The part of the brain that most recently evolved.
- Represents our higher capacities,




The image contains two lateral views of a human brain. In the left view, the Dorsolateral prefrontal cortex is highlighted in pink and circled with a pink oval. In the right view, the same region is highlighted in pink and circled with a pink oval. Labels at the bottom of the right brain include: Ventromedial prefrontal cortex, Caudate nucleus, Putamen, and Nucleus accumbens.

Slide 20

Reward-based Learning

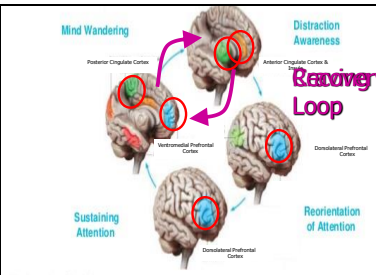
The High Road

- The prefrontal cortex consciously regulates behavior.
- The first to go offline when we get stressed.
- Back to System 1,
 - The DMN



The image shows a lateral view of a human brain with the prefrontal cortex highlighted in pink and circled with a pink oval. Labels at the bottom include: Ventromedial prefrontal cortex, Caudate nucleus, Putamen, and Nucleus accumbens.

Slide 21



The diagram illustrates the Recovery Loop with four brain regions highlighted in red circles and connected by arrows in a clockwise cycle. The regions are: Anterior Cingulate Cortex & Putamen (top right), Dorsolateral Prefrontal Cortex (right), Dorsomedial Prefrontal Cortex (bottom), and Posterior Cingulate Cortex (left). The text 'Recovery Loop' is written in large purple letters in the center. Labels for each region are: Mind Wandering (Anterior Cingulate Cortex & Putamen), Distraction Awareness (Anterior Cingulate Cortex & Putamen), Reorientation of Attention (Dorsolateral Prefrontal Cortex), and Sustaining Attention (Dorsomedial Prefrontal Cortex). A small copyright notice at the bottom left reads: © Hoeksma et al., 2012; Reed et al., 2014.

Slide 22

Reward-based Learning

High & Low Road

- System 1 is like Captain Kirk:



- Our passionate and sometimes irrational mind - More primitive, emotional & impulsive.




22

Slide 23

Reward-based Learning

High & Low Road

- System 2 is like Mr. Spock:



- Our rational mind – System 2

23

Slide 24

Reward-based Learning




Mr. Spock, now that I have a captive audience, I'd like to perform my famous rendition of "Lynyrd Skynyrd" in the key of bassoon!


Please, Captain, not that! Anything but that!

Slide 28

The person who chooses to throw the bomb will be held responsible for the deaths of the other 99. The person who chooses to throw the bomb will be held responsible for the deaths of the other 99.




Disinhibited prefrontal cortex

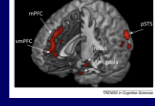


MORAL REASONING

The person who chooses to throw the bomb will be held responsible for the deaths of the other 99. The person who chooses to throw the bomb will be held responsible for the deaths of the other 99.



MORAL INTUITION



MORAL INTUITION

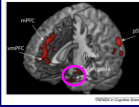

28

Slide 29

Reward-based Learning

System 1 & 2 Working Together =

- Emotional Intelligence/Wise Mind




29

Slide 30

Helpful to keep System 2's gas tank full.

- Simple things:
- Enough sleep.
- Eat well & enough,
- Exercise, etc., -



30

Slide 31

Reward-based Learning

How to Rewire?




- ❖ One way:
- ❖ Focus on our natural tendency to learn from rewards!
- ❖ Part of this is learning how to move from temporary happiness & pleasure_(hedonism)
- ❖ To:

31

Slide 32

How to Rewire?

Reward-based Learning




- ❖ Lasting peace, contentment and joy!_(eudaimonia)

32


Slide 33

Reward-based Learning

How to Rewire?



- ❖ Focus on the type of reward:
- ❖ From immediate, quick pleasure to slower, less dramatic pleasure!

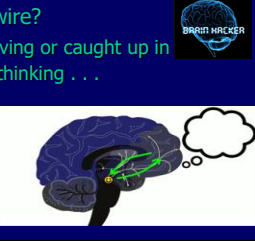


Slide 34

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How to Rewire?

- ❖ When craving or caught up in negative thinking . . .
- ❖ Refocus
- ❖ Distract




Slide 35

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How to Rewire?

- ❖ The Multitasking Myth
- ❖ Can only focus on 1 thing at a time





35

Slide 36

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Reward-based Learning

So, craving is like a fire
Fed by using and thinking about using...
Burns down when there is no more fuel



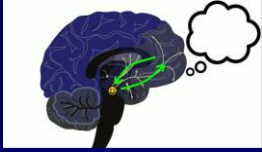
36

Slide 37

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How to Rewire/Refocus?

- ❖ Gratitude



37

Slide 38

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How to Rewire?

- ❖ Gratitude
- ❖ Loving Kindness
- ❖ Goals
 - ❖ Short-term pain, Long-term gain!



38

Slide 39

Intertemporal Bargaining

Keep an Eye On The Big Picture/Your Goal

“One is too many, a thousand not enough.” Big Book

Recovery:
Short-term pain, Long-term gain

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Slide 40

Reward-based Learning

Short-term pain?

- ❖ Stop the pursuit of addiction.
- ❖ Stop the pursuit of negative behaviors.

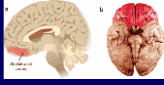



Slide 41

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Solution: Reward-based Learning

- The **"STOP"** part of the brain:
- A wedge between the impulse and the action (Brewer)



Slide 42

Reward-based Learning

Short-term pain?

- ❖ Stop the pursuit of addiction.
- ❖ Think it through.
- ❖ Play the tape forward.




Slide 43

Reward-based Learning

How to Rewire?


- ❖ In addition, to the type of pleasure to pursue,
- ❖ Pay attention to our stress:
 - ❖ our feelings,
 - ❖ our dis-ease.
- ❖ These can be our compass! ..



43

Slide 44

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Needle of "south" points toward stress
And the natural tendency to look for immediate relief
and the distraction of short-term reward and pleasure . . .

44

Slide 45

Reward-based Learning



When stressed (trigger):

1. Protectively contract or distance ourselves (behavior), [Using/drink]
2. Feel better (reward).

With each contraction, we become more rigid, less resilient.

The deeper we groove these pathways into the brain, the more likely they are to become ruts that we get stuck in . . .


45

Slide 46

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Reward-based Learning

Needle of "north" points away from stress . . .
Learn to walk the other way!




46

Slide 47

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Reward-based Learning

Through the hard work of a recovery
program . . .
Less intense and longer lasting pleasures.




47

Slide 48

Reward-based Learning

What to do when get Lost because of:

- Stress and
- Chasing quick relief and pleasure?
- **STOP!**



48

Slide 49




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Reward-based Learning

If get lost in the woods:

- > Stop
- > Breath
- > Think
- > Activate System 2
- > Use a compass!

Only when reoriented and have a clear sense of direction should you start moving again.



49

Slide 50

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Reward-based Learning

When get lost in Life:

- > Angry
- > Frustrated
- > Confused
- > Craving

Can pull out our compass and ask ourselves, "Where am I headed with this?"

"We can even bow to our habit in a gesture of gratitude because in fact, in this moment, it is acting as a teacher." (Brewer, 194)



50

Slide 51

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The Law of Holes

When you find yourself in a hole:
Stop digging!e



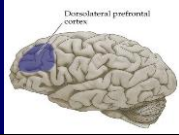
51

Slide 52

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System 2: The High Road

- Using System 2 to deal w/cravings




Dorsolateral prefrontal cortex

Slide 53

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Cravings

Wash over the brain like a wave.



53

Slide 54

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Reward-based Learning

Sometimes the waves are small.



54

Slide 58

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Cravings - Solutions

1. Don't take the wave. Dive under the wave.



58

Slide 59

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Cravings - Solutions

2. Learn to Surf it!




59

Slide 60

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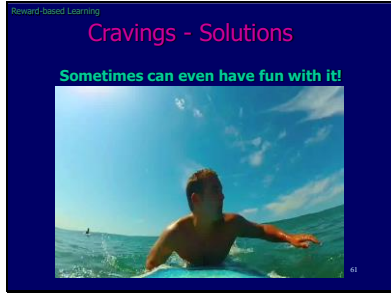
Reward-based Learning



Can use mindfulness.
To learn to surf the waves.
Observe the craving.
This "noting practice" can be a surfboard to help get on the craving wave and ride it until the wave is over or get to shore.

60

Slide 61



Slide 62



Slide 63



Slide 64

Reward-based Learning

Ride the Wave with RAIN

- **R**ECOGNIZE and **R**elax
- **A**CCEPT
- **I**NVESTIGATE
- **N**OTE



Slide 65

Reward-based Learning

Ride the Wave with RAIN


- **R**ECOGNIZE the wanting or craving is coming, and then **R**ELAX into it.
- **A**CCEPT this wave as it is; don't ignore it, distract yourself, or try to do something about it. This is your experience. Find a way that works for you, such as a word or phrase, or a simple nod of the head (I consent, here we go, this is it, etc.). To catch the wave of wanting, you have to study it carefully.
- **I**NVESTIGATING it as it builds. Do this by asking, "What does my body feel like right now?" Don't go looking. See what arises most prominently. Let it come to you. Finally.
- **N**OTE the experience as you follow it. Keep it simple by using short phrases or single words. For example: thinking, restlessness in stomach, rising sensation, burning, etc. Follow it until it completely subsides. If you get distracted, return to the investigation by repeating the question, "what does my body feel?"

Slide 66

Reward-based Learning

Ride the Wave with RAIN

- **R**ECOGNIZE and **R**elax
- **A**CCEPT
- **I**NVESTIGATE
- **N**OTE



Slide 67

Reward-based Learning

Mindfulness

"This awareness is what mindfulness is all about: Seeing clearly what happens when we get caught up in our behaviors and then becoming viscerally disenchanted." (Brene Brown, 2012)

47

Slide 68

Reward-based Learning

Joy Vs. Excitement

- ❖ Excitement brings with it restlessness and a contracted urge for more.
- ❖ Joy that results from curiosity is smoother, and open, rather than contracted.
- ❖ Joy arises from being attentive and curious.
- ❖ That type of consciousness is possible virtually at any waking moment. It just takes awareness.
- ❖ Excitement requires something to happen to us or requires us to procure something that we want.

48

Slide 69

Reward-based Learning

Joy Vs. Excitement

- ❖ To start switching from excitement to joyful engagement:
 1. Notice triggers (stress)
 2. Drop into an open, curious awareness.
 3. Notice the rewards
- ❖ RAIN

49

Slide 70

Reward-based Learning

Pleasure vs. Happiness

A Pleasure rush comes from being in System 1 – the Default Mode Network

A slow, steady pleasure drip comes from being in System 2 – the Frontal Attention Network

=

HAPPINESS

70

Slide 71

Reward-based Learning

The Secret Sauce

If reward-based learning is our natural tendency, why not co-opt it to learn how to move from temporary "happiness" to lasting states of peace, contentment, and joy? ¹⁴¹

Until we define happiness for ourselves, clearly seeing the difference between excitement and joy . . .

We will keep returning to the fruits of our desires. ¹⁴²


71

Slide 72

Reward-based Learning

The Secret Sauce

- Pay Attention.
- Strengthen your Prefrontal Cortex/System 2.





72

Slide 73

Reward-based Learning

The Secret Sauce

- Survive Cravings
- Distract - Refocus
- Surf them when you can.





Slide 74

Reward-based Learning

The Secret Sauce

- Follow your compass to less stress.
- Learn to notice the quiet pleasures that lead to long-term peace, contentment and joy!



Slide 75

The End!

75

Slide 79

Reward-based Learning

Pleasure vs. Happiness

"The most we can hope for is to create the best possible conditions for success, then let go of the outcome. The ride is a lot more fun that way."⁵

The Secret Sauce

Blue highlight | Page: 169

79

Slide 80

Reward-based Learning

The Secret Sauce

The important thing is to enjoy the activity for its own sake, and to know that what matters is not the result, but the control one is acquiring over one's attention."⁷

80

Slide 81

Reward-based Learning

The Secret Sauce

relapsed because they couldn't handle the stress. Without some type of training to increase their prefrontal cortex goes offline from the stress, and

179


81

Slide 82

Reward-based Learning

Reward-based Learning

Connection Then Distinction



82

Slide 83

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Mindfulness

Dal Lin, Carlo & Poretto, Anna & Scodro, Marta & Perazzolo Marra, Martina & Iliceto, Sabino & Tona, Francesco. (2015). Coronary microvascular and endothelial function regulation: Crossroads of psychoneuroendocrine immunitary signals and quantum physics [Part C]. Journal of Integrative Cardiology. 1. 10.15761/JIC.1000137.

83

Slide 84

Reward-based Learning

Mindfulness

Default Mode Network
more active at rest (task negative)
mind wandering

Attention Network
more active during tasks (task positive)
engaged attention



MIND WANDERING

FOCUS

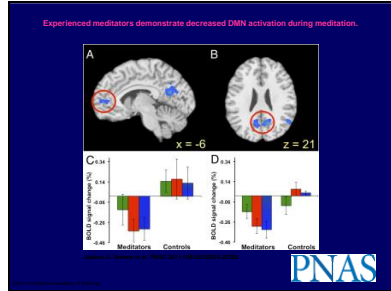


AWARENESS

SHIFT

84

Slide 97



Slide 98

Reward-based Learning

Reward-based Learning

- Craving is like a fire
- Fed by using...
- Burns down when there is no more fuel

Figure 98: Reward-based Learning. The slide features a blue background with a fire burning brightly in the center, illustrating the concept of craving as a fire. The text above the fire lists three points: 'Craving is like a fire', 'Fed by using...', and 'Burns down when there is no more fuel'. A small inset image of a fire is visible in the bottom right corner.

Slide 99

Reward-based Learning

Pleasure vs. Happiness

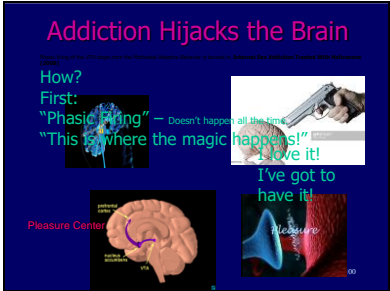
- notice the trigger (stress), perform the behavior (become interested and curious), and reward ourselves in a way that is aligned with our stress compass (notice joy, tranquility, concentration, and equanimity). Repeat.
- Blue highlight | Page: 147

Figure 99: Pleasure vs. Happiness. The slide features a blue background with a diagram of the brain. The diagram shows the Limbic System (LIMBIC SYSTEM) and the Reward System (REWARD SYSTEM). The Limbic System is labeled as the 'Emotional or Feeling Brain' and includes the Amygdala and Hypothalamus. The Reward System is labeled as the 'Pleasure Brain' and includes the Nucleus Accumbens and Ventral Tegmental Area. The diagram also shows the Spinal Cord (enters brain here) and the LMI (Limbic Midline Interactions). The text above the diagram lists two points: 'notice the trigger (stress), perform the behavior (become interested and curious), and reward ourselves in a way that is aligned with our stress compass (notice joy, tranquility, concentration, and equanimity). Repeat.' and 'Blue highlight | Page: 147'. The number 99 is visible in the bottom right corner.

Slide 100

Addiction Hijacks the Brain

How?
First:
"Phasic Ping" — Doesn't happen all the time
"This is where the magic happens!"
"I love it!"
"I've got to have it!"



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Nesuro
