Neuroscience of Addictions made Simple

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Can brain structure change?

Try HARDER!!

Too Weak

Hope

Rehab

Natural

Physiology

AA

Choice

Hitting Bottom

Use it

Try HARDER!!

Addiction

Will power

Recovery

What is will? How much of it do I need to stop?

Tolerance Weed

Can brain structure change?
The important brain stuff
The 4 Major Areas

Cerebral Cortex / PFC
- Self-Awareness
- Executive decision
- Impulsivity
- Logic
- The inhibitory center
- Emotional inhibitions
- Judgment

Limbic System
- Threat response
- Pleasure
- Reward
- Anxiety
- Rage
- Emotional memory
- Memory
Also associated with:
- Rage
- Fear
- Anxiety
- Aggression

Autonomic Nervous System (ANS)
- Stress response
- Controls medulla functioning
- Simulates the limbic to react

Medulla
- Heart rate (slows/weakens)
- Breathing (slows)
- Blood pressure (drops)
- Core body temperature
This is the sweet spot for cognition and controlling emotional stability.
ADDICTIVE MECHANISMS

• Physical vs. Psychological addictions

• **Tissue Dependence**: adaptation of body to constant presence of a substance

• **Conditioned response**: Any stimulus experienced repetitively or that has a strong enough impact on our brain, begins to change our structure accordingly
SLOW

Having too much slow wave activity (THETA) in the front part of our head:

Fogginess  Poor Decision Making
Impulsive  Depression
Unmotivated  Reduced Memory

&

The front can’t regulate or stop the limbic system anymore
Having too much fast wave activity (BETA) in the limbic system (middle):

- Anxiety
- Anger
- Memory issues
- Addictive behaviors

- Impulsivity
- Heightened fight/flight
- Stress
- Driven to use

The limbic system is not being stopped by the frontal anymore.
Now that we’ve identified the basics of addictions...
The brain is slow to change back.

Often sets us up for relapse
YES! Even marijuana

- 67 participants
- Began between 16-17 years-old
- Average: 1 time per day for 3 years
- Stopped use at 19-20 years-old
- Monitored for Two years after stopping

Imaging two years after completely stopping
One big issue is...

Even though a person stops/cuts back use, the brain imbalance will often stay close to the same. This leaves behind:

<table>
<thead>
<tr>
<th>Depression</th>
<th>Anger</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anxiety</td>
<td>Confusion</td>
</tr>
<tr>
<td>Bipolar-type symptoms</td>
<td>Dulled affect</td>
</tr>
<tr>
<td>Inability to control emotions</td>
<td>ADHD symptoms</td>
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</tbody>
</table>
Alternatives Brain Work

Mindful-Meditation

COOR
The COOR method is simple and easy to learn or teach. COOR is simply conditioning the relaxation state that comes with mindful meditation to an object. For instance, many individuals use a simple stone or pebble. One client used a button from her mother’s coat she had cherished since childhood. This technique is most successful when the object is small enough to fit in the hand and be fairly unnoticeable when carried in the front pocket and is not completely smooth. I have discovered most individuals develop a much stronger neurological link if the object has different textures to explore with the finger and thumb.

1. Find a quiet place to meditate
2. Sit in whatever position is comfortable for you.
3. Take the object of choice and hold it between the thumb, index, and middle fingers of your non-dominant hand. Some examples are: stones, pebbles, buttons, prayer beads, rosary, or pendants. A specific sound or object of visual focus can replace the tactile functioning if applicable.
4. Take three deep breaths. Each breath should have a longer exhalation than inhalation. This type of breathing activates the parasympathetic nervous system—relaxation.
5. With each of the three breaths, draw your attention to the face, neck, and then shoulders. With each exhale, consciously allow the muscles in these areas to relax and melt downwards.
6. Your attention should be on either breathing or the object. Remember, it is natural for the mind to wonder some—if it does, give the thought the appropriate amount of recognition, then just repeat step four and gently tell yourself, “back to my breath”.
7. Gently explore the object with your fingers and thumb. Only occasionally bring your attention away from the object long enough to make sure the body is relaxed and you are breathing properly. There are many smartphone apps to assist with breath timing if needed.
8. Attempt 10 minutes per day to begin with.

The object you choose should only be used for this purpose. Avoid touching it throughout the rest of the day. Feel free to repeat step number 4 throughout the day if needed. Eventually, the object will become neurologically linked. This link can be used in two ways. Firstly, the brain will begin to go into a more relaxed state as soon as the linked object is held. Secondly, you can repeat step four while bringing your attention to the object when experiencing heightened or stressful moments. The link can often allow a person to better control stressful or anxious moments.
Another Alternative

NEUROFEEDBACK
Let’s say this is the brain of someone with addiction as his/her main issue.
Once the addictive brain processes are changed in the brain, the brain is still out of balance in other areas.