Huberman Lab: Essentials: Erasing Fears & Traumas Using Modern Neuroscience

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About Dr. Andrew Huberman

American neuroscientist, professor at Stanford University, and host of the popular *Huberman Lab*podcast. His academic work focuses on brain development, function, and neuroplasticity, while his podcast translates complex science into actionable tools for everyday health and performance. He holds a PhD from UC Davis and conducted post-doctoral work at Stanford, where he has a lab and teaches medical students.

[What follows are quotes from the episode above. These quotes stood out to psychotherapist Emil Barna in his listening. They are not meant to be exhaustive nor representative of the entire episode. All quotes are to be read in this context and must not replace medical and/or other professional advice.]

“Stress is a physiological response. And it is fair to say that we cannot have fear without having several, if not all of the elements of the stress response.

However, we can have stress without having fear. Likewise, people are familiar with the phrase or the word rather, anxiety. Anxiety tends to be stress about some future event, although it can mean other things as well. We can't really have fear without seeing or observing or experiencing some of the elements of anxiety, but we can have anxiety without having fear. So what you're starting to realize is that fear is built up from certain basic elements that include stress and anxiety. And then there is trauma. The operational definition of trauma is that some fear took place, which of course includes stress and anxiety. And that fear somehow gets embedded or activated in our nervous system such that it shows up at times when it's maladaptive, meaning that fear doesn't serve us well and it gets reactivated at various times."

"one of the hallmarks of fear and one of the hallmarks of trauma is that they involve fear responses that are long lasting. Even if those fearful events, the events in the world that trigger the HPA axis can be very brief. The fear response can reverberate through your system because the chemicals that are involved in this HPA axis have a fast component and a longer lasting component. And the longer lasting component can actually feed back to the brain and literally control gene expression, which can take many days and build out new circuits and new chemicals that can embed fear in our brain and body."

"the amygdala is part of the threat reflex, so much so that we can really say that it's the final common pathway through which the threat reflex flows."

"it's [...] part of a much bigger complex or collection of neurons called the amygdaloid complex. That complex has anywhere from 12 to 14 areas [...] the amygdala is not just an area for threat, it's an area for generating threat that reflexes, that integrates lots of different types of information. Information from our memory systems, like the hippocampus, and from our sensory systems, our eyes, our ears, our nose, our mouth, etc. So taste information, vision, auditory information, touch, et cetera, flow into the so-called lateral portion of the amygdala or the amygdaloid complex."

[On the relationship between fear and the reward system.]
"The amygdaloid complex actually projects to areas of the dopamine system, the so-called nucleus accumbens, the mesolimbic reward pathway, for those of you that want to look that up or that remember from the dopamine episodes. We have pathways in our brain that are associated with pursuit, motivation and reward. And the neuromodulator dopamine is largely responsible for that feeling of craving, pursuit and reward. And this threat center is actually able to communicate with and activate the dopamine system."

[On the PFC and the fear response ... and why this is important.]
"Top-down processing is the way that your prefrontal cortex and other areas of the brain can control or suppress a reflex. You tell yourself, I want to do this, or I should do this, or even though I don't want to, I'm going to do it anyway. So this fourth component of fear is really our ability to attach narrative, to attach

meaning and to attach purpose to what is by all accounts and purposes, a generic response."

"language of memories as protective or memories as dangerous, it's an important aspect of fear because much of the fear system is a memory system. It's designed to embed a memory of certain previous experiences in us such that the threat reflex is activated in the anticipation of what might happen."

[On therapies—Huberman discusses prolonged exposure therapy, CPT, CBT, ketamine, and MDMA based on his conversations with clinicians.]
"One needs to extinguish a fear and or trauma and replace that fearful or traumatic memory or idea or response with a positive response. And this is something that's rarely discussed, both in the scientific literature, but certainly in the general discussion around fear and trauma."

"You need to diminish the old experience. And when I say diminish, I mean reduce the amplitude of the physiological response. But even after that's occurred, there's an essential need to relearn a new narrative."

"the prefrontal cortex is this amazing capacity of our brain real estate to create meaning, to attach meaning and purpose to things that otherwise are just reflexive."

"Ketamine is a dissociative anesthetic. Dissociation, in its essence, is really about viewing what's happening from a different perspective than what normally one would view that experience from. What seems to be the case is that it somehow allows the patient, the individual, to recount their trauma while feeling either none or a very different set of emotional experiences that they experienced in the actual trauma or fearful experience. So it's a remapping of new onto old, new meaning new feelings onto old feelings while staying in the exact same narrative."

"MDMA is a unique compound in that it leads to very large increases in the amount of both dopamine and serotonin in the brain and body simultaneously. And that's a unique circumstance that is just simply not seen under normal conditions. From a subjective standpoint, people under the influence of MDMA in the therapeutic setting tend to report immense feelings of connection or resonance with people or even things with music, with objects."

"most of the approaches that are out there involving drug treatments, typical drug treatments, would involve suppressing the level of internal arousal, just trying to bring that down."

[Cyclic hyperventilation]
"what we've been doing in human subjects is having them do breathing protocols called cyclic hyperventilation, which is somewhat stressful. It's five minutes a day of stress [...] but not continuously for the five minutes because

many people would pass out or feel extremely uncomfortable. It involves inhale, exhale, inhale, exhale, very deep, inhale through the nose, exhale through the mouth, and then every 25 or 30 breaths or so doing a full exhale and holding one's breath, lungs empty for about 25, maybe 30, maybe even 60 seconds, and then continuing until five minutes is up. Subjects report and our data indicate that people feel a heightened level of autonomic arousal. [...] You feel a heating up, you feel a, um, some people will perspire, some people get wide-eyed, some people feel agitated. That's adrenaline being released into your system. It's stressful in air quotes. You can imagine a very brief, five minutes a day, two weeks intervention in which people, with the support of a clinician, we would hope, would deliberately induce a physiological state that's very stressful [...] Not shying away from the stress response, but increasing their own stress response deliberately, and maybe in conjunction with recounting the traumatic or fearful circumstance."

"there are 12 studies, believe it or not, that orally ingested saffron at 30 milligrams seems to be a reliable dose for reducing anxiety on the standard inventories"

"Inositol has been shown to create a very notable decrease in anxiety symptoms. It's a fairly high dose that's used, but believe it or not, the potency of this effect is on par with many of the prescription antidepressants. 18 grams of inositol taken for a full month, and it does take some time for these symptoms of anxiety to be improved. Now, the question is, when would you take it? Well, by the logic of what we spelled out today, you probably would not want to take it during a session or prior to a session where you were trying to amplify the intensity of an experience and the recounting of an experience in efforts to eventually extinguish that experience"

*[**A brief commentary:** This episode explores the neurobiology of stress and trauma and a few therapies (mostly top-down approaches) that can help physiological arousal and 'restorying' (as I'll call it). Didactically, you can apply these principles with a polygonal lens, mix in a few somatic approaches for regulation, and IFS for the 'restorying' process—I think you've got a good approach to apply to trauma. I understand the cognitive approaches are evidence-based ... I just don't agree they're the ones my clients have ever gravitated towards. In fact, they actively avoid them. But I see their utility in the psychoeducational phase of treatment. In particular following format: experience > sensation/feeling > thought (not thought before feeling as the cognitive therapies emphasise) > belief > attitude > behaviour > experience. This conceptualisation comes from Dr. Joe Dispenza's work, the best of which is* 'The Placebo Effect'. *Think what you might about Dispenza, this concept is spot on.]*

These notes were collected by psychotherapist and author Emil Barna in his efforts to assist with professional development and further education for himself and those who read them. You can find out more about Emil by visiting