

What Causes Stuttering & Treatment for Stutter | Dr. Erich Jarvis & Dr. Andrew Huberman

What's being developed in terms of treatments for stutter Yeah So we actually uh accidentally came across stuttering in songbirds And we've published several papers on this to try to figure out the neurobiological basis The first study we had was a brain area called the basal ganglia This what's the the striatum part of the basal ganglia involved in coordinating movements learning how to make movements when it was damaged in these in this in a speech like pathway in these birds What we found is that they started to stutter as the brain region recovered and unlike humans they actually recovered after three or four months And why is that the case Because bird brains undergoes new neurogenesis in a way that human or mammal brains don't Uh And it was the new neurons that were coming in into the circuit uh but not quite you know with the right proper activity uh was resulting in this stuttering in these birds Uh And after it was repaired not exactly the old song came back as after the repair but still it recovered a lot better And it's now known they call this neurogen neurogenic stuttering in humans Uh would be damage to the basal ganglia or some type of disruption to the basal ganglia at a young age also causes stuttering in humans and even those who are born with stuttering Uh um it's it's often the basal ganglia uh that's disrupted than some other brain circuit And we think the speech part of the basal ganglia can adults who maintain a stutter from childhood uh repair that stutter they can repair it with uh therapy with learning how to speak slower uh learning how to tap out a rhythm during And yeah I'm not a speech pathologist but I started reading this literature uh and talking to others that you know um colleagues who actually ST ST stuttering So yes there there there are ways to overcome the stuttering through um through uh you know behavioral therapy Uh And I think all of the uh tools out there have something to do with sensory motor integration uh controlling what you hear with what you output in a thoughtful controlled way helps reduce the suing There are a couple of examples from real life that I wanna touch on And um one is somewhat facetious but um but now I realize is is a serious neurobiological issue Serious meaning I think interesting which is that every once in a while I will have a conversation with somebody who says the last word of the sentence along with me and it seems annoying in some instances Uh But I'm guessing this is just a breakthrough of the motor pattern that they're hearing what I'm

saying very well So I'm gonna interpret this kindly and think they're hearing what I'm saying They're literally hearing it in their mind and they're getting that low level electrical activity to their throat and they're just joining me in the uh in the enunciation of what I'm saying Probably without realizing it Can we assume that that might be the case Well II I wouldn't be surprised so that you know the motor theory of speech perception where this idea originally came what you hear is going through your speech circuit and then also activating those muscles slightly Uh So yes Um So one might argue OK is that speech circuit now interpreting what that person is speaking now you listening to me and is going to finish it off because it's already going through their brain and they can predict it That would be II theory and and I don't think the verdict out there is known but that's one the other is uh synchronizing turn taking in in the co in the um conversation where you're acknowledging that we understand each other uh by finishing off what I say Uh And it's almost like a social bonding kind of thing The other could be I want the person to shut out so I can speak as well and take that turn and and each pair of people have a rhythm to their conversation And if you have somebody who's over talkative versus under talkative or vice versa that rhythm can be lost in them finishing ideas and going back and forth But I I think having something to do with turn taking as well makes a lot of sense I have a colleague at Stanford who says um that interruption is a sign of interest Uh I'm not sure that everyone agrees I think it's highly contextual but there is this form of of a verbal nod I was saying or things of that sort And there are many of these Uh and I'm often told by my audience you know that I don't interrupt my guests and things of that sort oftentimes I'll just get caught in the natural flow of the conversation Uh But II I think we've had pretty good turn taking here I hope that so far so good I feel that way I'm glad you feel that way because especially in the context of a discussion about language it seems important