

WEBVTT

NOTE duration:"00:10:08.1260000"

NOTE language:en-us

NOTE Confidence: 0.832913

00:00:00.000 --> 00:00:01.445 My name is Michelle Hampson.

NOTE Confidence: 0.832913

00:00:01.445 --> 00:00:03.512 I'm going to be talking today about

NOTE Confidence: 0.832913

00:00:03.512 --> 00:00:05.776 some work that our group has been doing

NOTE Confidence: 0.832913

00:00:05.835 --> 00:00:07.635 using real time fMRI neurofeedback to

NOTE Confidence: 0.832913

00:00:07.635 --> 00:00:09.758 try to treat and study mental illness.

NOTE Confidence: 0.832913

00:00:09.758 --> 00:00:12.110 So what do we mean by real time?

NOTE Confidence: 0.832913

00:00:12.110 --> 00:00:12.686 fMRI neurofeedback?

NOTE Confidence: 0.832913

00:00:12.686 --> 00:00:14.702 Well, this is a picture of somebody

NOTE Confidence: 0.832913

00:00:14.702 --> 00:00:16.230 receiving this form of neurofeedback.

NOTE Confidence: 0.832913

00:00:16.230 --> 00:00:18.018 They're lying in an MRI scanner

NOTE Confidence: 0.832913

00:00:18.018 --> 00:00:19.568 and we're monitoring their brain

NOTE Confidence: 0.832913

00:00:19.568 --> 00:00:21.356 activity patterns and we give them

NOTE Confidence: 0.832913

00:00:21.356 --> 00:00:23.287 feedback over the course of the scan,

NOTE Confidence: 0.832913

00:00:23.290 --> 00:00:25.132 showing them how some aspect of

NOTE Confidence: 0.832913

00:00:25.132 --> 00:00:26.678 their brain activity is changing

NOTE Confidence: 0.832913

00:00:26.678 --> 00:00:28.774 over the course of the of the scan

NOTE Confidence: 0.832913

00:00:28.774 --> 00:00:30.902 and they get lots of practice trying

NOTE Confidence: 0.832913

00:00:30.902 --> 00:00:32.395 to control that brain activity.

NOTE Confidence: 0.832913

00:00:32.395 --> 00:00:34.105 Using the feedback that we give

NOTE Confidence: 0.832913

00:00:34.105 --> 00:00:35.910 them as a training signal.

NOTE Confidence: 0.832913

00:00:35.910 --> 00:00:37.710 So there's many different applications

NOTE Confidence: 0.832913

00:00:37.710 --> 00:00:39.851 using this technique across the world

NOTE Confidence: 0.832913

00:00:39.851 --> 00:00:41.867 to try to train people to control

NOTE Confidence: 0.832913

00:00:41.867 --> 00:00:43.727 specific aspects of their brain function.

NOTE Confidence: 0.832913

00:00:43.730 --> 00:00:46.019 I'm going to talk today about a

NOTE Confidence: 0.832913

00:00:46.019 --> 00:00:47.574 specific application where we use

NOTE Confidence: 0.832913

00:00:47.574 --> 00:00:49.352 this to try to train people to

NOTE Confidence: 0.832913

00:00:49.352 --> 00:00:50.910 control contamination anxiety.

NOTE Confidence: 0.832913

00:00:50.910 --> 00:00:53.510 So why am I focused on contamination anxiety?

NOTE Confidence: 0.832913

00:00:53.510 --> 00:00:53.836 Well,
NOTE Confidence: 0.832913

00:00:53.836 --> 00:00:55.466 it's a major symptom dimension
NOTE Confidence: 0.832913

00:00:55.466 --> 00:00:56.770 of obsessive compulsive disorder,
NOTE Confidence: 0.832913

00:00:56.770 --> 00:00:59.052 and it's also common in the healthy
NOTE Confidence: 0.832913

00:00:59.052 --> 00:00:59.378 population.
NOTE Confidence: 0.832913

00:00:59.380 --> 00:01:01.858 And regardless of whether you're a piece
NOTE Confidence: 0.832913

00:01:01.858 --> 00:01:04.597 of patient with OC D or a healthy person.
NOTE Confidence: 0.832913

00:01:04.600 --> 00:01:06.230 If you're experiencing contamination anxiety,
NOTE Confidence: 0.832913

00:01:06.230 --> 00:01:08.318 we know that you have hyperactivity.
NOTE Confidence: 0.832913

00:01:08.320 --> 00:01:09.880 And your orbital frontal cortex.
NOTE Confidence: 0.832913

00:01:09.880 --> 00:01:11.977 So this is an area right at the front
NOTE Confidence: 0.832913

00:01:11.977 --> 00:01:14.450 of your brain which provides kind of
NOTE Confidence: 0.832913

00:01:14.450 --> 00:01:16.430 a biomarker of contamination anxiety.
NOTE Confidence: 0.832913

00:01:16.430 --> 00:01:18.774 And we were wondering if we train people
NOTE Confidence: 0.832913

00:01:18.774 --> 00:01:20.800 to control activity in this region,
NOTE Confidence: 0.832913

00:01:20.800 --> 00:01:22.672 will that help them to better

NOTE Confidence: 0.832913
00:01:22.672 --> 00:01:23.920 control their contamination anxiety?
NOTE Confidence: 0.832913
00:01:23.920 --> 00:01:25.714 So that's the study I'm going
NOTE Confidence: 0.832913
00:01:25.714 --> 00:01:27.350 to describe to you today.
NOTE Confidence: 0.832913
00:01:27.350 --> 00:01:29.222 In this study we collected three
NOTE Confidence: 0.832913
00:01:29.222 --> 00:01:30.158 different outcome measures.
NOTE Confidence: 0.832913
00:01:30.160 --> 00:01:31.051 First of all,
NOTE Confidence: 0.832913
00:01:31.051 --> 00:01:33.130 we assessed how well the training enabled
NOTE Confidence: 0.832913
00:01:33.189 --> 00:01:35.457 people to control their target brain area.
NOTE Confidence: 0.832913
00:01:35.460 --> 00:01:37.020 We also monitor brain connectivity,
NOTE Confidence: 0.832913
00:01:37.020 --> 00:01:37.606 pattern changes.
NOTE Confidence: 0.832913
00:01:37.606 --> 00:01:39.657 So we collected resting state data before
NOTE Confidence: 0.832913
00:01:39.657 --> 00:01:41.709 the intervention after the intervention.
NOTE Confidence: 0.832913
00:01:41.710 --> 00:01:43.732 To see if the training basically
NOTE Confidence: 0.832913
00:01:43.732 --> 00:01:45.421 rewired their brain connectivity and
NOTE Confidence: 0.832913
00:01:45.421 --> 00:01:46.821 then Thirdly and most importantly
NOTE Confidence: 0.832913

00:01:46.821 --> 00:01:49.028 we had a measure of control over
NOTE Confidence: 0.832913

00:01:49.028 --> 00:01:50.743 contamination anxiety that we collected
NOTE Confidence: 0.832913

00:01:50.743 --> 00:01:52.514 before the training and after the
NOTE Confidence: 0.832913

00:01:52.514 --> 00:01:54.140 training to see if the neurofeedback
NOTE Confidence: 0.832913

00:01:54.188 --> 00:01:56.078 training improved people's ability to
NOTE Confidence: 0.832913

00:01:56.078 --> 00:01:57.590 control their contamination anxiety.
NOTE Confidence: 0.832913

00:01:57.590 --> 00:01:59.438 The last thing I'll mention before
NOTE Confidence: 0.832913

00:01:59.438 --> 00:02:01.757 going on is that in addition to
NOTE Confidence: 0.832913

00:02:01.757 --> 00:02:03.791 the subjects who got real neural
NOTE Confidence: 0.832913

00:02:03.791 --> 00:02:05.038 feedback in this study,
NOTE Confidence: 0.832913

00:02:05.040 --> 00:02:07.007 we had a control group that received
NOTE Confidence: 0.832913

00:02:07.007 --> 00:02:09.569 a fake or sham form of neurofeedback.
NOTE Confidence: 0.832913

00:02:09.570 --> 00:02:12.940 So just so you have a sense of what the.
NOTE Confidence: 0.832913

00:02:12.940 --> 00:02:14.230 Neurofeedback is like for participants.
NOTE Confidence: 0.832913

00:02:14.230 --> 00:02:16.036 I'm going to show you a video,
NOTE Confidence: 0.832913

00:02:16.040 --> 00:02:17.594 which is exactly what one of our

NOTE Confidence: 0.832913
00:02:17.594 --> 00:02:19.648 subjects saw in the neural feedback training.
NOTE Confidence: 0.832913
00:02:19.650 --> 00:02:21.514 On the left is an arrow that cues
NOTE Confidence: 0.832913
00:02:21.514 --> 00:02:23.258 the mess to their current task.
NOTE Confidence: 0.832913
00:02:23.260 --> 00:02:24.868 When it's a white arrow pointing
NOTE Confidence: 0.832913
00:02:24.868 --> 00:02:26.609 forward that tells them just to rest,
NOTE Confidence: 0.832913
00:02:26.610 --> 00:02:28.521 relax and look at the neutral image
NOTE Confidence: 0.832913
00:02:28.521 --> 00:02:30.727 at other periods of time it will be a
NOTE Confidence: 0.832913
00:02:30.727 --> 00:02:32.737 red arrow pointing up or a blue arrow
NOTE Confidence: 0.832913
00:02:32.737 --> 00:02:34.345 pointing down and that skewing them
NOTE Confidence: 0.80956364
00:02:34.350 --> 00:02:35.862 to try to increase or decrease
NOTE Confidence: 0.80956364
00:02:35.862 --> 00:02:37.449 activity in the target brain area.
NOTE Confidence: 0.80956364
00:02:37.450 --> 00:02:38.615 And during those periods of
NOTE Confidence: 0.80956364
00:02:38.615 --> 00:02:39.547 provocative images shown depicting
NOTE Confidence: 0.80956364
00:02:39.547 --> 00:02:40.798 some contamination related thing.
NOTE Confidence: 0.80956364
00:02:40.800 --> 00:02:42.258 So I've started playing the video
NOTE Confidence: 0.80956364

00:02:42.258 --> 00:02:44.090 and you can see the feedback is
NOTE Confidence: 0.80956364

00:02:44.090 --> 00:02:45.710 provided here in this line graph.
NOTE Confidence: 0.80956364

00:02:45.710 --> 00:02:47.570 At the bottom of the screen.
NOTE Confidence: 0.80956364

00:02:47.570 --> 00:02:48.720 And right now they're just
NOTE Confidence: 0.80956364

00:02:48.720 --> 00:02:49.870 resting and looking at what's
NOTE Confidence: 0.80956364

00:02:49.913 --> 00:02:51.308 happening in their orbital cortex,
NOTE Confidence: 0.80956364

00:02:51.310 --> 00:02:52.798 but now it's an increased block,
NOTE Confidence: 0.80956364

00:02:52.800 --> 00:02:54.050 so now they're trying to
NOTE Confidence: 0.80956364

00:02:54.050 --> 00:02:55.540 get the line to go up.
NOTE Confidence: 0.80956364

00:02:55.540 --> 00:02:56.986 They can look at this picture
NOTE Confidence: 0.80956364

00:02:56.986 --> 00:02:58.529 of a dirty stove and think,
NOTE Confidence: 0.80956364

00:02:58.530 --> 00:02:59.775 oh that's a food surface
NOTE Confidence: 0.80956364

00:02:59.775 --> 00:03:01.020 that really should be clean.
NOTE Confidence: 0.80956364

00:03:01.020 --> 00:03:02.721 Whatever is going to be helpful to
NOTE Confidence: 0.80956364

00:03:02.721 --> 00:03:03.993 activate this anxiety related brain
NOTE Confidence: 0.80956364

00:03:03.993 --> 00:03:05.743 area Now it's going to decrease block,

NOTE Confidence: 0.80956364

00:03:05.750 --> 00:03:06.990 so they're going to decrease.

NOTE Confidence: 0.80956364

00:03:06.990 --> 00:03:08.418 Block is to bring the activity

NOTE Confidence: 0.80956364

00:03:08.418 --> 00:03:09.939 in this area back down there

NOTE Confidence: 0.80956364

00:03:09.939 --> 00:03:11.469 supposed to look at the image,

NOTE Confidence: 0.80956364

00:03:11.470 --> 00:03:13.059 but they can be appraised it you

NOTE Confidence: 0.80956364

00:03:13.059 --> 00:03:14.709 know you're in is usually sterile.

NOTE Confidence: 0.80956364

00:03:14.710 --> 00:03:16.210 There's nothing to be worried about.

NOTE Confidence: 0.80956364

00:03:16.210 --> 00:03:18.274 Whatever they think is going to be helpful.

NOTE Confidence: 0.80956364

00:03:18.280 --> 00:03:19.552 For controlling that region and now

NOTE Confidence: 0.80956364

00:03:19.552 --> 00:03:20.959 it's arrest block so they basically

NOTE Confidence: 0.80956364

00:03:20.959 --> 00:03:22.254 cycle through these three blocks,

NOTE Confidence: 0.80956364

00:03:22.260 --> 00:03:23.838 getting lots and lots of practice

NOTE Confidence: 0.80956364

00:03:23.838 --> 00:03:25.599 trying to get activity in the target

NOTE Confidence: 0.80956364

00:03:25.599 --> 00:03:27.139 brain area to increase in the red

NOTE Confidence: 0.80956364

00:03:27.194 --> 00:03:28.976 blocks and decreasing the blue blocks.

NOTE Confidence: 0.80956364

00:03:28.980 --> 00:03:32.008 And the sham subjects.
NOTE Confidence: 0.80956364

00:03:32.010 --> 00:03:33.962 Our match one to one to the real
NOTE Confidence: 0.80956364

00:03:33.962 --> 00:03:35.111 neurofeedback subjects an are shown
NOTE Confidence: 0.80956364

00:03:35.111 --> 00:03:36.539 at the time courses from the real
NOTE Confidence: 0.80956364

00:03:36.588 --> 00:03:38.008 neural feedback subjects brains,
NOTE Confidence: 0.80956364

00:03:38.010 --> 00:03:39.480 but misled to believe that getting
NOTE Confidence: 0.80956364

00:03:39.480 --> 00:03:40.760 feedback from their own brain.
NOTE Confidence: 0.80956364

00:03:40.760 --> 00:03:42.552 So to the extent that the real
NOTE Confidence: 0.80956364

00:03:42.552 --> 00:03:43.581 neurofeedback subject got the
NOTE Confidence: 0.80956364

00:03:43.581 --> 00:03:45.079 line higher in the red than the
NOTE Confidence: 0.80956364

00:03:45.079 --> 00:03:46.369 blue blocks there Matcham subject
NOTE Confidence: 0.80956364

00:03:46.369 --> 00:03:47.714 is misled to believe they're
NOTE Confidence: 0.80956364

00:03:47.714 --> 00:03:49.224 having a similar level of success.
NOTE Confidence: 0.80956364

00:03:49.224 --> 00:03:51.757 So that was the kind of control that we used.
NOTE Confidence: 0.80956364

00:03:51.760 --> 00:03:53.260 If you want to know anything
NOTE Confidence: 0.80956364

00:03:53.260 --> 00:03:54.260 else about our methods,

NOTE Confidence: 0.80956364
00:03:54.260 --> 00:03:55.926 we have a job paper with a
NOTE Confidence: 0.80956364
00:03:55.926 --> 00:03:57.260 cheesy video you can watch,
NOTE Confidence: 0.80956364
00:03:57.260 --> 00:03:58.760 but I'm going to present to
NOTE Confidence: 0.80956364
00:03:58.760 --> 00:03:59.760 you now the results.
NOTE Confidence: 0.80956364
00:03:59.760 --> 00:04:00.788 So first of all,
NOTE Confidence: 0.80956364
00:04:00.788 --> 00:04:02.330 did the training help them better
NOTE Confidence: 0.80956364
00:04:02.381 --> 00:04:03.817 control their target region?
NOTE Confidence: 0.80956364
00:04:03.820 --> 00:04:05.100 We evaluated that ability to
NOTE Confidence: 0.80956364
00:04:05.100 --> 00:04:06.380 control the target region at
NOTE Confidence: 0.80956364
00:04:06.433 --> 00:04:07.918 four points throughout the study.
NOTE Confidence: 0.80956364
00:04:07.920 --> 00:04:09.468 The important thing to note is
NOTE Confidence: 0.80956364
00:04:09.468 --> 00:04:11.458 that at the end of the training,
NOTE Confidence: 0.80956364
00:04:11.460 --> 00:04:12.588 they had statistically significantly
NOTE Confidence: 0.80956364
00:04:12.588 --> 00:04:14.280 greater control than they did at
NOTE Confidence: 0.80956364
00:04:14.330 --> 00:04:15.560 the beginning of the training.
NOTE Confidence: 0.80956364

00:04:15.560 --> 00:04:16.110 So indeed,
NOTE Confidence: 0.80956364

00:04:16.110 --> 00:04:17.485 it seemed like the neurofeedback
NOTE Confidence: 0.80956364

00:04:17.485 --> 00:04:18.886 training did improve their ability
NOTE Confidence: 0.80956364

00:04:18.886 --> 00:04:20.464 to control their target brain area,
NOTE Confidence: 0.80956364

00:04:20.470 --> 00:04:21.289 which is encouraging.
NOTE Confidence: 0.80956364

00:04:21.289 --> 00:04:22.927 But the more important question is,
NOTE Confidence: 0.80956364

00:04:22.930 --> 00:04:24.200 does it actually translate into
NOTE Confidence: 0.80956364

00:04:24.200 --> 00:04:25.805 anything outside of the scanner so
NOTE Confidence: 0.80956364

00:04:25.805 --> 00:04:27.527 they actually get better at controlling
NOTE Confidence: 0.80956364

00:04:27.527 --> 00:04:28.388 their contamination anxiety?
NOTE Confidence: 0.80956364

00:04:28.390 --> 00:04:29.107 So for that,
NOTE Confidence: 0.80956364

00:04:29.107 --> 00:04:30.541 we turn to our behavioral measure
NOTE Confidence: 0.80956364

00:04:30.541 --> 00:04:32.083 that we collected before and
NOTE Confidence: 0.80956364

00:04:32.083 --> 00:04:33.025 after the intervention.
NOTE Confidence: 0.80956364

00:04:33.030 --> 00:04:33.302 Indeed,
NOTE Confidence: 0.80956364

00:04:33.302 --> 00:04:34.118 what we found.

NOTE Confidence: 0.80956364

00:04:34.118 --> 00:04:35.750 Is that the training did improve

NOTE Confidence: 0.80956364

00:04:35.802 --> 00:04:37.266 ability to control contamination

NOTE Confidence: 0.80956364

00:04:37.266 --> 00:04:38.730 anxiety in the neurofeedback

NOTE Confidence: 0.80956364

00:04:38.730 --> 00:04:40.635 subjects and it had no significant

NOTE Confidence: 0.80956364

00:04:40.635 --> 00:04:42.035 effect and the control group.

NOTE Confidence: 0.80956364

00:04:42.040 --> 00:04:43.540 So this was really exciting to

NOTE Confidence: 0.80956364

00:04:43.540 --> 00:04:45.262 us because it implies that this

NOTE Confidence: 0.80956364

00:04:45.262 --> 00:04:46.922 training can help people better

NOTE Confidence: 0.80956364

00:04:46.922 --> 00:04:47.918 control their contamination

NOTE Confidence: 0.8354518

00:04:47.975 --> 00:04:49.229 anxiety and contamination.

NOTE Confidence: 0.8354518

00:04:49.230 --> 00:04:52.047 Anxiety is a major symptom dimension of OC D,

NOTE Confidence: 0.8354518

00:04:52.050 --> 00:04:54.138 so that means that it has the same

NOTE Confidence: 0.8354518

00:04:54.138 --> 00:04:56.120 effects in the clinical population.

NOTE Confidence: 0.8354518

00:04:56.120 --> 00:04:57.368 This intervention would have

NOTE Confidence: 0.8354518

00:04:57.368 --> 00:04:58.304 direct clinical utility,

NOTE Confidence: 0.8354518

00:04:58.310 --> 00:05:00.188 but it raises the question well,
NOTE Confidence: 0.8354518

00:05:00.190 --> 00:05:01.996 what's going on in the brains of
NOTE Confidence: 0.8354518

00:05:01.996 --> 00:05:03.535 these people that they're better
NOTE Confidence: 0.8354518

00:05:03.535 --> 00:05:05.295 able to control their contamination
NOTE Confidence: 0.8354518

00:05:05.295 --> 00:05:06.870 anxiety after the training.
NOTE Confidence: 0.8354518

00:05:06.870 --> 00:05:09.190 So for that we looked at the resting
NOTE Confidence: 0.8354518

00:05:09.190 --> 00:05:10.818 state connectivity changes we used
NOTE Confidence: 0.8354518

00:05:10.818 --> 00:05:12.468 to measure of global connectivity,
NOTE Confidence: 0.8354518

00:05:12.470 --> 00:05:14.654 where we evaluate which parts of the
NOTE Confidence: 0.8354518

00:05:14.654 --> 00:05:16.334 brain changed their global amount
NOTE Confidence: 0.8354518

00:05:16.334 --> 00:05:18.374 of connectivity over the course of
NOTE Confidence: 0.8354518

00:05:18.374 --> 00:05:20.458 the training and what we found is
NOTE Confidence: 0.8354518

00:05:20.458 --> 00:05:22.079 that these areas shown with red,
NOTE Confidence: 0.8354518

00:05:22.079 --> 00:05:22.637 yellow colors,
NOTE Confidence: 0.8354518

00:05:22.637 --> 00:05:23.753 whereas it had significant
NOTE Confidence: 0.8354518

00:05:23.753 --> 00:05:25.002 increases in global connectivity

NOTE Confidence: 0.8354518
00:05:25.002 --> 00:05:26.458 in the neurofeedback subjects.
NOTE Confidence: 0.8354518
00:05:26.460 --> 00:05:27.875 These are prefrontal control areas
NOTE Confidence: 0.8354518
00:05:27.875 --> 00:05:30.044 and the areas shown in blue had
NOTE Confidence: 0.8354518
00:05:30.044 --> 00:05:31.436 decreases in global connectivity,
NOTE Confidence: 0.8354518
00:05:31.440 --> 00:05:33.498 so these are a lot of limbic
NOTE Confidence: 0.8354518
00:05:33.498 --> 00:05:34.768 emotion processing parts of
NOTE Confidence: 0.8354518
00:05:34.768 --> 00:05:36.096 the brain including insula,
NOTE Confidence: 0.8354518
00:05:36.100 --> 00:05:37.304 substantia nigra, amygdala, hippocampus.
NOTE Confidence: 0.8354518
00:05:37.304 --> 00:05:39.540 So it seemed like this is very
NOTE Confidence: 0.8354518
00:05:39.540 --> 00:05:40.671 consistent with neurobiological
NOTE Confidence: 0.8354518
00:05:40.671 --> 00:05:42.179 models of emotion regulation,
NOTE Confidence: 0.8354518
00:05:42.180 --> 00:05:44.085 whereby prefrontal control areas come
NOTE Confidence: 0.8354518
00:05:44.085 --> 00:05:45.990 online to help downregulate processing
NOTE Confidence: 0.8354518
00:05:46.050 --> 00:05:48.058 in limbic or emotion parts of the brain.
NOTE Confidence: 0.8354518
00:05:48.060 --> 00:05:50.370 And it seemed like the neural feedback
NOTE Confidence: 0.8354518

00:05:50.370 --> 00:05:52.282 was strengthening that circuitry an I
NOTE Confidence: 0.8354518

00:05:52.282 --> 00:05:54.291 should note that this is these effects
NOTE Confidence: 0.8354518

00:05:54.348 --> 00:05:56.568 were specific to the neurofeedback group.
NOTE Confidence: 0.8354518

00:05:56.570 --> 00:05:58.746 We did a similar analysis in the control
NOTE Confidence: 0.8354518

00:05:58.746 --> 00:06:00.895 group and there were no significant
NOTE Confidence: 0.8354518

00:06:00.895 --> 00:06:02.443 changes in global connectivity.
NOTE Confidence: 0.8354518

00:06:02.450 --> 00:06:04.970 But this is the pattern we see in the
NOTE Confidence: 0.8354518

00:06:04.970 --> 00:06:07.736 group of neurofeedback subjects as a whole.
NOTE Confidence: 0.8354518

00:06:07.740 --> 00:06:09.668 An within this group there are a lot
NOTE Confidence: 0.8354518

00:06:09.668 --> 00:06:10.999 of differences between subjects,
NOTE Confidence: 0.8354518

00:06:11.000 --> 00:06:13.136 so some subjects really get a lot from
NOTE Confidence: 0.8354518

00:06:13.136 --> 00:06:14.855 the intervention and other subjects find
NOTE Confidence: 0.8354518

00:06:14.855 --> 00:06:16.990 it frustrating and get very little from it.
NOTE Confidence: 0.8354518

00:06:16.990 --> 00:06:18.990 So we wanted to see what's happening in
NOTE Confidence: 0.8354518

00:06:18.990 --> 00:06:20.799 the brains of those good responders,
NOTE Confidence: 0.8354518

00:06:20.800 --> 00:06:22.075 and we computed correlation map

NOTE Confidence: 0.8354518
00:06:22.075 --> 00:06:23.692 examining which parts of the brain
NOTE Confidence: 0.8354518
00:06:23.692 --> 00:06:25.147 had changes in global connectivity,
NOTE Confidence: 0.8354518
00:06:25.150 --> 00:06:27.047 and the people who really responded well.
NOTE Confidence: 0.8354518
00:06:27.050 --> 00:06:28.682 And what we found jumping out
NOTE Confidence: 0.8354518
00:06:28.682 --> 00:06:29.498 of this analysis.
NOTE Confidence: 0.8354518
00:06:29.500 --> 00:06:31.222 This is analysis that treats every
NOTE Confidence: 0.8354518
00:06:31.222 --> 00:06:33.307 part of the brain in the same way,
NOTE Confidence: 0.8354518
00:06:33.310 --> 00:06:34.930 but what popped out of this
NOTE Confidence: 0.8354518
00:06:34.930 --> 00:06:36.395 analysis was our target region
NOTE Confidence: 0.8354518
00:06:36.395 --> 00:06:38.030 of the orbital frontal cortex.
NOTE Confidence: 0.8354518
00:06:38.030 --> 00:06:39.614 So the people who were rewiring
NOTE Confidence: 0.8354518
00:06:39.614 --> 00:06:41.365 this target area where the people
NOTE Confidence: 0.8354518
00:06:41.365 --> 00:06:42.975 who are really gaining control
NOTE Confidence: 0.8354518
00:06:42.975 --> 00:06:44.390 over their contamination anxiety,
NOTE Confidence: 0.8354518
00:06:44.390 --> 00:06:45.935 which is encouraging that we're
NOTE Confidence: 0.8354518

00:06:45.935 --> 00:06:48.029 targeting a reasonable part of the brain.
NOTE Confidence: 0.8354518

00:06:48.030 --> 00:06:50.446 If you manage to rewire the brain area,
NOTE Confidence: 0.8354518

00:06:50.450 --> 00:06:52.564 you get better control over your anxiety.
NOTE Confidence: 0.8354518

00:06:52.570 --> 00:06:54.705 So we thought all this data was
NOTE Confidence: 0.8354518

00:06:54.705 --> 00:06:56.617 really promising and we decided we
NOTE Confidence: 0.8354518

00:06:56.617 --> 00:06:58.483 wanted to move forward in studying
NOTE Confidence: 0.8354518

00:06:58.483 --> 00:07:00.147 this in an OC D population.
NOTE Confidence: 0.8354518

00:07:00.150 --> 00:07:02.558 So we applied for funding from NIH and
NOTE Confidence: 0.8354518

00:07:02.558 --> 00:07:05.299 we're now running a clinical trial in OC T.
NOTE Confidence: 0.8354518

00:07:05.300 --> 00:07:07.322 This is a randomized double blind
NOTE Confidence: 0.8354518

00:07:07.322 --> 00:07:09.025 placebo controlled trial which were
NOTE Confidence: 0.8354518

00:07:09.025 --> 00:07:10.789 actually close to wrapping up now.
NOTE Confidence: 0.8354518

00:07:10.790 --> 00:07:12.662 It's very similar to the study
NOTE Confidence: 0.8354518

00:07:12.662 --> 00:07:13.910 I just described to,
NOTE Confidence: 0.8354518

00:07:13.910 --> 00:07:15.620 except that we're running OC D
NOTE Confidence: 0.8354518

00:07:15.620 --> 00:07:16.760 patients and we're monitoring

NOTE Confidence: 0.8354518
00:07:16.816 --> 00:07:18.481 symptoms with classic symptom scales
NOTE Confidence: 0.8354518
00:07:18.481 --> 00:07:20.146 rather than a behavioral measure.
NOTE Confidence: 0.8354518
00:07:20.150 --> 00:07:21.435 But one interesting new aspect
NOTE Confidence: 0.8354518
00:07:21.435 --> 00:07:22.720 of the study is that
NOTE Confidence: 0.8355556
00:07:22.773 --> 00:07:24.801 we're following these subjects up clinically
NOTE Confidence: 0.8355556
00:07:24.801 --> 00:07:27.009 after they receive the neural feedback.
NOTE Confidence: 0.8355556
00:07:27.010 --> 00:07:29.818 So in the study I just described to you,
NOTE Confidence: 0.8355556
00:07:29.820 --> 00:07:31.068 we assess their ability,
NOTE Confidence: 0.8355556
00:07:31.068 --> 00:07:32.004 their, their contamination,
NOTE Confidence: 0.8355556
00:07:32.004 --> 00:07:34.500 symptoms of a few days after the training,
NOTE Confidence: 0.8355556
00:07:34.500 --> 00:07:36.372 and we do that in this
NOTE Confidence: 0.8355556
00:07:36.372 --> 00:07:37.620 clinical trial as well.
NOTE Confidence: 0.8355556
00:07:37.620 --> 00:07:39.762 But in addition, we bring them back
NOTE Confidence: 0.8355556
00:07:39.762 --> 00:07:42.067 two weeks later and assess them again.
NOTE Confidence: 0.8355556
00:07:42.070 --> 00:07:43.848 Then we also bring back a month
NOTE Confidence: 0.8355556

00:07:43.848 --> 00:07:45.391 later and assess their symptoms
NOTE Confidence: 0.8355556

00:07:45.391 --> 00:07:46.839 amonth after the training.
NOTE Confidence: 0.8355556

00:07:46.840 --> 00:07:48.676 So in this clinical trial we're
NOTE Confidence: 0.8355556

00:07:48.676 --> 00:07:50.257 actually following them from month
NOTE Confidence: 0.8355556

00:07:50.257 --> 00:07:52.063 post neurofeedback and the reason we're
NOTE Confidence: 0.8355556

00:07:52.063 --> 00:07:54.396 doing that as we wanted to rule out
NOTE Confidence: 0.8355556

00:07:54.396 --> 00:07:56.043 the possibility that the effects we
NOTE Confidence: 0.8355556

00:07:56.043 --> 00:07:57.884 are inducing were just transient so it
NOTE Confidence: 0.8355556

00:07:57.884 --> 00:07:59.650 wouldn't be super clinically useful.
NOTE Confidence: 0.8355556

00:07:59.650 --> 00:08:01.318 If you know participants who got
NOTE Confidence: 0.8355556

00:08:01.318 --> 00:08:02.430 real neurofeedback got better
NOTE Confidence: 0.8355556

00:08:02.480 --> 00:08:04.050 while they're receiving the neural
NOTE Confidence: 0.8355556

00:08:04.050 --> 00:08:05.306 feedback and their symptoms,
NOTE Confidence: 0.8355556

00:08:05.310 --> 00:08:06.114 you know decreased,
NOTE Confidence: 0.8355556

00:08:06.114 --> 00:08:08.889 and then as soon as you know feedback ended,
NOTE Confidence: 0.8355556

00:08:08.890 --> 00:08:10.380 they regressed back to baseline.

NOTE Confidence: 0.8355556
00:08:10.380 --> 00:08:12.306 That wouldn't be super clinically useful
NOTE Confidence: 0.8355556
00:08:12.306 --> 00:08:14.299 'cause you kind of need something
NOTE Confidence: 0.8355556
00:08:14.299 --> 00:08:16.255 that persists in a person's life.
NOTE Confidence: 0.8355556
00:08:16.260 --> 00:08:18.244 What we were hoping to show by doing
NOTE Confidence: 0.8355556
00:08:18.244 --> 00:08:20.214 this follow up is that the improvements
NOTE Confidence: 0.8355556
00:08:20.214 --> 00:08:22.290 in symptoms that we induced with the
NOTE Confidence: 0.8355556
00:08:22.290 --> 00:08:23.790 training were maintained during the
NOTE Confidence: 0.8355556
00:08:23.790 --> 00:08:25.722 month that we were following up afterwards,
NOTE Confidence: 0.8355556
00:08:25.722 --> 00:08:27.780 but we found was actually quite surprising.
NOTE Confidence: 0.8355556
00:08:27.780 --> 00:08:28.904 The subjects got better
NOTE Confidence: 0.8355556
00:08:28.904 --> 00:08:29.747 during the neurofeedback,
NOTE Confidence: 0.8355556
00:08:29.750 --> 00:08:31.374 but they continued to get better for
NOTE Confidence: 0.8355556
00:08:31.374 --> 00:08:33.088 a month after the neurofeedback so
NOTE Confidence: 0.8355556
00:08:33.088 --> 00:08:34.693 that the biggest differences between
NOTE Confidence: 0.8355556
00:08:34.693 --> 00:08:36.502 the control group and the real
NOTE Confidence: 0.8355556

00:08:36.502 --> 00:08:37.618 neurofeedback group were actually
NOTE Confidence: 0.8355556

00:08:37.618 --> 00:08:38.734 a month after training.
NOTE Confidence: 0.8355556

00:08:38.734 --> 00:08:40.119 So this was totally surprising
NOTE Confidence: 0.8355556

00:08:40.119 --> 00:08:41.549 to us and we thought,
NOTE Confidence: 0.8355556

00:08:41.550 --> 00:08:43.391 is this specific to OC D is
NOTE Confidence: 0.8355556

00:08:43.391 --> 00:08:44.640 this like an idiot?
NOTE Confidence: 0.8355556

00:08:44.640 --> 00:08:46.050 Syncratic phenomena for this application?
NOTE Confidence: 0.8355556

00:08:46.050 --> 00:08:46.887 But then we.
NOTE Confidence: 0.8355556

00:08:46.887 --> 00:08:48.840 We went and looked at another study
NOTE Confidence: 0.8355556

00:08:48.901 --> 00:08:50.875 we were running in Trett syndrome,
NOTE Confidence: 0.8355556

00:08:50.880 --> 00:08:52.668 which showed exactly the same pattern.
NOTE Confidence: 0.8355556

00:08:52.670 --> 00:08:54.458 This was a different population being
NOTE Confidence: 0.8355556

00:08:54.458 --> 00:08:56.249 trained on a different brain area,
NOTE Confidence: 0.8355556

00:08:56.250 --> 00:08:57.735 but we are assessing different
NOTE Confidence: 0.8355556

00:08:57.735 --> 00:08:58.626 type of symptoms.
NOTE Confidence: 0.8355556

00:08:58.630 --> 00:09:00.716 But we saw the same qualitative pattern,

NOTE Confidence: 0.8355556
00:09:00.720 --> 00:09:01.473 so we thought,
NOTE Confidence: 0.8355556
00:09:01.473 --> 00:09:01.724 well,
NOTE Confidence: 0.8355556
00:09:01.724 --> 00:09:03.590 maybe this is not an uncommon pattern
NOTE Confidence: 0.8355556
00:09:03.590 --> 00:09:05.402 in neurofeedback experiments and so we
NOTE Confidence: 0.8355556
00:09:05.402 --> 00:09:07.867 wrote this up and published in neuroimaging.
NOTE Confidence: 0.8355556
00:09:07.870 --> 00:09:09.430 It since heard from multiple groups
NOTE Confidence: 0.8355556
00:09:09.430 --> 00:09:10.887 that they are seeing similar
NOTE Confidence: 0.8355556
00:09:10.887 --> 00:09:12.339 patterns in other applications.
NOTE Confidence: 0.8355556
00:09:12.340 --> 00:09:14.956 So it's a really important for the people
NOTE Confidence: 0.8355556
00:09:14.956 --> 00:09:17.108 designing studies in our field to know this.
NOTE Confidence: 0.8355556
00:09:17.110 --> 00:09:18.680 Because if you're going to.
NOTE Confidence: 0.8355556
00:09:18.680 --> 00:09:20.168 Running her feedback study,
NOTE Confidence: 0.8355556
00:09:20.168 --> 00:09:22.400 it's very important to follow people
NOTE Confidence: 0.8355556
00:09:22.467 --> 00:09:24.663 up for a month or you might be missing
NOTE Confidence: 0.8355556
00:09:24.663 --> 00:09:26.717 the time point of greatest effect.
NOTE Confidence: 0.8355556

00:09:26.720 --> 00:09:28.704 So this that I've described here is just
NOTE Confidence: 0.8355556

00:09:28.704 --> 00:09:31.008 one of the studies were running at Yale.
NOTE Confidence: 0.8355556

00:09:31.010 --> 00:09:32.504 There are many different ongoing studies
NOTE Confidence: 0.8355556

00:09:32.504 --> 00:09:34.490 looking at all sorts of different disorders.
NOTE Confidence: 0.8355556

00:09:34.490 --> 00:09:36.086 If you're interested in using real
NOTE Confidence: 0.8355556

00:09:36.086 --> 00:09:37.731 time after a feedback to treat
NOTE Confidence: 0.8355556

00:09:37.731 --> 00:09:38.779 or study mental illness,
NOTE Confidence: 0.8355556

00:09:38.780 --> 00:09:41.500 please come talk to me.
NOTE Confidence: 0.8355556

00:09:41.500 --> 00:09:43.594 I want to just quickly acknowledge
NOTE Confidence: 0.8355556

00:09:43.594 --> 00:09:44.990 contributions of the people.
NOTE Confidence: 0.8355556

00:09:44.990 --> 00:09:47.198 This I can't possibly show everybody
NOTE Confidence: 0.8355556

00:09:47.198 --> 00:09:49.179 doing their feedback research at Yale.
NOTE Confidence: 0.8355556

00:09:49.180 --> 00:09:51.749 This is the subgroup that was involved
NOTE Confidence: 0.8355556

00:09:51.749 --> 00:09:54.406 specifically in that sub clinical OC D study,
NOTE Confidence: 0.75988865

00:09:54.410 --> 00:09:55.806 our primary clinical collaborator
NOTE Confidence: 0.75988865

00:09:55.806 --> 00:09:57.900 in that setting is Chris Pittenger.

NOTE Confidence: 0.75988865

00:09:57.900 --> 00:10:00.138 Teodora Stoica collected all that day.

NOTE Confidence: 0.75988865

00:10:00.140 --> 00:10:02.121 That I presented to you and Dustin

NOTE Confidence: 0.75988865

00:10:02.121 --> 00:10:04.089 Chinese has been really involved in,

NOTE Confidence: 0.75988865

00:10:04.090 --> 00:10:06.100 you know, creating and maintaining the

NOTE Confidence: 0.75988865

00:10:06.100 --> 00:10:08.124 real time imaging systems that we use.