WEBVTT

NOTE duration:"01:10:30"

NOTE recognizability:0.931

NOTE language:en-us

NOTE Confidence: 0.93622824

 $00:00:00.000 \longrightarrow 00:00:00.720$  So with that, I'm going

NOTE Confidence: 0.7643104666666667

00:00:03.360 --> 00:00:05.238 to okay. Welcome

NOTE Confidence: 0.93824092

 $00{:}00{:}05{.}240 \dashrightarrow 00{:}00{:}06{.}040$  to those who are seeing

NOTE Confidence: 0.9402536

 $00:00:06.040 \longrightarrow 00:00:07.200$  us on the recording.

NOTE Confidence: 0.93421556

00:00:10.680 --> 00:00:11.400 I'm going to turn now

NOTE Confidence: 0.9402536

 $00:00:11.400 \longrightarrow 00:00:14.196$  to our first first winner and

NOTE Confidence: 0.9402536

00:00:14.200 --> 00:00:16.720 1st Presenter AZ. I'll stop

NOTE Confidence: 0.9553487

 $00:00:17.840 \longrightarrow 00:00:18.400$  that anymore.

NOTE Confidence: 0.926835733333333

 $00:00:31.010 \longrightarrow 00:00:31.730$  Here we go.

NOTE Confidence: 0.890974393333333

00:00:34.130 --> 00:00:36.300 So Izzy Alsop is a graduating resident

NOTE Confidence: 0.890974393333333

00:00:36.300 - > 00:00:38.316 this year in the Neuroscience

NOTE Confidence: 0.890974393333333

 $00{:}00{:}38.316$  -->  $00{:}00{:}40.764$  Research Training program and has

NOTE Confidence: 0.890974393333333

 $00{:}00{:}40.764 \dashrightarrow 00{:}00{:}43.049$  really been a remarkable colleague,

00:00:43.050 --> 00:00:44.898 trainee and citizen of our community

NOTE Confidence: 0.890974393333333

 $00{:}00{:}44.898 \dashrightarrow 00{:}00{:}46.450$  during his four years here.

NOTE Confidence: 0.890974393333333

 $00:00:46.450 \longrightarrow 00:00:48.790$  Now that doesn't surprise us.

NOTE Confidence: 0.890974393333333

 $00:00:48.790 \longrightarrow 00:00:50.315$  Because when we when we

NOTE Confidence: 0.890974393333333

00:00:50.315 --> 00:00:52.870 first saw his application,

NOTE Confidence: 0.890974393333333

00:00:52.870 --> 00:00:55.870 Aza did his his his bachelor's at North

NOTE Confidence: 0.890974393333333

00:00:55.870 --> 00:00:57.899 Carolina Central University before going

NOTE Confidence: 0.890974393333333

00:00:57.899 --> 00:01:01.270 to Harvard for his MD&MIT for his PhD,

NOTE Confidence: 0.890974393333333

 $00:01:01.270 \longrightarrow 00:01:02.950$  where he worked with K Ty,

NOTE Confidence: 0.890974393333333

 $00:01:02.950 \rightarrow 00:01:04.680$  who's a truly brilliant neuroscientist

NOTE Confidence: 0.890974393333333

 $00:01:04.680 \longrightarrow 00:01:05.718$  who's done groundbreaking

NOTE Confidence: 0.890974393333333

 $00:01:05.718 \longrightarrow 00:01:07.310$  work over the last 20 years,

NOTE Confidence: 0.890974393333333

 $00:01:07.310 \longrightarrow 00:01:08.750$  work with some of the leading

NOTE Confidence: 0.890974393333333

 $00:01:08.750 \longrightarrow 00:01:09.710$  people in our field.

NOTE Confidence: 0.890974393333333

 $00{:}01{:}09{.}710 \dashrightarrow 00{:}01{:}11{.}789$  And I read a lot of letters.

 $00:01:11.790 \longrightarrow 00:01:13.750$  I read a lot of strong letters.

NOTE Confidence: 0.890974393333333

 $00:01:13.750 \dashrightarrow 00:01:16.090$  A Ty's letter kind of floated up above

NOTE Confidence: 0.890974393333333

 $00{:}01{:}16.090 \dashrightarrow 00{:}01{:}18.782$  the table because because it was

NOTE Confidence: 0.890974393333333

 $00:01:18.782 \rightarrow 00:01:21.025$  so strong and so we expected great

NOTE Confidence: 0.890974393333333

00:01:21.025 --> 00:01:23.480 things of a CA when he came here

NOTE Confidence: 0.890974393333333

 $00:01:23.480 \rightarrow 00:01:25.466$  and we have not been disappointed.

NOTE Confidence: 0.93824092

00:01:28.060 --> 00:01:30.100 Aza You'll hear about his basic

NOTE Confidence: 0.93824092

 $00:01:30.100 \longrightarrow 00:01:31.995$  science grounded in the work he

NOTE Confidence: 0.93824092

00:01:31.995 --> 00:01:33.450 did his PhD student with Kay,

NOTE Confidence: 0.93824092

 $00{:}01{:}33{.}450 \dashrightarrow 00{:}01{:}35{.}020$  and then going on through some innovative,

NOTE Confidence: 0.93824092

 $00:01:35.020 \longrightarrow 00:01:35.888$  exciting new work that

NOTE Confidence: 0.93824092

 $00:01:35.888 \longrightarrow 00:01:36.973$  he's done while he's here.

NOTE Confidence: 0.93824092

 $00:01:36.980 \longrightarrow 00:01:38.116$  So I want to emphasize a couple

NOTE Confidence: 0.93824092

 $00{:}01{:}38.116 \dashrightarrow 00{:}01{:}39.060$  of the other things. Actually,

NOTE Confidence: 0.93824092

 $00:01:39.060 \rightarrow 00:01:40.460$  I haven't gone through all your slides.

NOTE Confidence: 0.93824092

00:01:40.460 --> 00:01:41.699 I don't know exactly what you're covering,

- NOTE Confidence: 0.93824092
- $00:01:41.700 \longrightarrow 00:01:43.380$  but that you might hear a
- NOTE Confidence: 0.93824092
- $00:01:43.380 \longrightarrow 00:01:44.780$  little bit less of today.
- NOTE Confidence: 0.93824092
- $00{:}01{:}45{.}700 \dashrightarrow 00{:}01{:}47{.}180$  One is that in addition
- NOTE Confidence: 0.946962533333333
- 00:01:47.180 --> 00:01:48.980 to continuing basic science work
- NOTE Confidence: 0.946962533333333
- 00:01:48.980 --> 00:01:50.970 growing out of his PhD studies,
- NOTE Confidence: 0.946962533333333
- $00:01:50.970 \longrightarrow 00:01:53.888$  Aza has grown and entirely
- NOTE Confidence: 0.946962533333333
- 00:01:53.888 --> 00:01:56.510 new clinical research.
- NOTE Confidence: 0.946962533333333
- $00{:}01{:}56{.}510 \dashrightarrow 00{:}01{:}58{.}750$  Line of work in in collaboration with
- NOTE Confidence: 0.946962533333333
- $00:01:58.750 \dashrightarrow 00:02:02.330$  Joy Hirsch and that involves the the
- NOTE Confidence: 0.946962533333333
- $00:02:02:330 \longrightarrow 00:02:04.761$  use of near infrared spectroscopy to
- NOTE Confidence: 0.946962533333333
- $00{:}02{:}04{.}761 \dashrightarrow 00{:}02{:}07{.}435$  image the brain and try to understand
- NOTE Confidence: 0.946962533333333
- $00{:}02{:}07{.}435 \dashrightarrow 00{:}02{:}09{.}748$  the interactions of the people in dyads
- NOTE Confidence: 0.9469625333333333
- $00{:}02{:}09{.}750 \dashrightarrow 00{:}02{:}12{.}305$  and also how that interacts with music.
- NOTE Confidence: 0.946962533333333
- $00{:}02{:}12{.}310 \dashrightarrow 00{:}02{:}13{.}443$  And so this is the second thing
- NOTE Confidence: 0.946962533333333
- $00:02:13.443 \rightarrow 00:02:14.507$  I want to tell you about A ZA,
- NOTE Confidence: 0.946962533333333

 $00:02:14.510 \longrightarrow 00:02:16.110$  which is a spectacular musician.

NOTE Confidence: 0.946962533333333

00:02:16.110 --> 00:02:19.230 He's released several albums he performs

NOTE Confidence: 0.946962533333333

00:02:19.230 --> 00:02:21.680 regularly around around New Haven.

NOTE Confidence: 0.946962533333333

 $00:02:21.680 \rightarrow 00:02:22.954$  The third thing I want to,

NOTE Confidence: 0.946962533333333

 $00{:}02{:}22{.}954 \dashrightarrow 00{:}02{:}25{.}310$  I want to say that you may not see in the

NOTE Confidence: 0.946962533333333

 $00{:}02{:}25{.}310 \dashrightarrow 00{:}02{:}27{.}400$  slides today is what a wonderful clinician,

NOTE Confidence: 0.946962533333333

 $00{:}02{:}27{.}400 \dashrightarrow 00{:}02{:}29{.}759$  clinical leader and clinical citizen he is.

NOTE Confidence: 0.946962533333333

 $00{:}02{:}29{.}760 \dashrightarrow 00{:}02{:}31{.}352$  A ZA was one of the chief residents

NOTE Confidence: 0.946962533333333

 $00{:}02{:}31{.}352 \dashrightarrow 00{:}02{:}32{.}722$  on the Clinical Neuroscience Research

NOTE Confidence: 0.946962533333333

00:02:32.722 --> 00:02:34.570 Unit this year which I directed

NOTE Confidence: 0.946962533333333

 $00{:}02{:}34{.}570 \dashrightarrow 00{:}02{:}36{.}514$  on which Doctor Cho is one of the

NOTE Confidence: 0.946962533333333

 $00:02:36.514 \rightarrow 00:02:38.056$  attendings and it ran incredibly

NOTE Confidence: 0.946962533333333

 $00:02:38.056 \rightarrow 00:02:40.196$  smoothly and introduced new innovations

NOTE Confidence: 0.946962533333333

 $00:02:40.196 \longrightarrow 00:02:43.036$  and how the unit ran to try to meet

NOTE Confidence: 0.946962533333333

 $00{:}02{:}43.040 \dashrightarrow 00{:}02{:}44.552$  patients needs while we were there

NOTE Confidence: 0.946962533333333

 $00:02:44.552 \rightarrow 00:02:45.560$  which was true leadership.

- NOTE Confidence: 0.954342254
- $00:02:47.520 \longrightarrow 00:02:48.896$  And finally, that that
- NOTE Confidence: 0.954342254
- $00:02:48.896 \longrightarrow 00:02:51.320$  dedication to citizenship
- NOTE Confidence: 0.936899033333333
- $00:02:51.320 \rightarrow 00:02:53.524$  goes goes far beyond AZA's academic
- NOTE Confidence: 0.936899033333333
- $00:02:53.524 \rightarrow 00:02:56.800$  work to his work in in advocacy,
- NOTE Confidence: 0.936899033333333
- 00:02:56.800 -> 00:02:58.680 in leadership, in the community,
- NOTE Confidence: 0.936899033333333
- $00{:}02{:}58.680 \dashrightarrow 00{:}03{:}02.760$  in antiracist work and so forth.
- NOTE Confidence: 0.936899033333333
- 00:03:02.760 --> 00:03:04.260 Aza is also extraordinarily
- NOTE Confidence: 0.936899033333333
- $00:03:04.260 \longrightarrow 00:03:05.760$  dedicated to his family.
- NOTE Confidence: 0.936899033333333
- $00{:}03{:}05{.}760 \dashrightarrow 00{:}03{:}07{.}800$  I just got a chance to meet his mom today.
- NOTE Confidence: 0.936899033333333
- $00:03:07.800 \longrightarrow 00:03:09.914$  Thank you for being here with us.
- NOTE Confidence: 0.936899033333333
- 00:03:09.920 --> 00:03:12.390 And. Really I I mean people
- NOTE Confidence: 0.936899033333333
- $00:03:12.390 \longrightarrow 00:03:13.222$  talk about triple threats.
- NOTE Confidence: 0.936899033333333
- $00:03:13.230 \longrightarrow 00:03:14.406$  I kind of lost track of how
- NOTE Confidence: 0.936899033333333
- $00{:}03{:}14.406 \dashrightarrow 00{:}03{:}15.560$  many threats we got out here.
- NOTE Confidence: 0.936899033333333
- 00:03:15.560 00:03:17.498 So, so anyway it's so it's been
- NOTE Confidence: 0.936899033333333

 $00:03:17.498 \longrightarrow 00:03:19.190$  a great pleasure to get to know

NOTE Confidence: 0.936899033333333

 $00{:}03{:}19{.}190 \dashrightarrow 00{:}03{:}21{.}506$  Aza over the last four years.

NOTE Confidence: 0.936899033333333

 $00:03:21.510 \rightarrow 00:03:23.204$  It is a great pleasure to introduce

NOTE Confidence: 0.936899033333333

 $00:03:23.204 \rightarrow 00:03:24.777$  him to give this presentation and

NOTE Confidence: 0.936899033333333

 $00:03:24.777 \longrightarrow 00:03:27.166$  and the award today and it is a great

NOTE Confidence: 0.936899033333333

 $00:03:27.166 \rightarrow 00:03:28.648$  pleasure that he will be staying

NOTE Confidence: 0.936899033333333

 $00{:}03{:}28.648 \dashrightarrow 00{:}03{:}30.838$  with us as an assistant professor

NOTE Confidence: 0.936899033333333

00:03:30.838 --> 00:03:32.948 transition formally on July 1st,

NOTE Confidence: 0.936899033333333

 $00{:}03{:}32{.}950 \dashrightarrow 00{:}03{:}33{.}950$  but that's in process now.

NOTE Confidence: 0.936899033333333

 $00:03:33.950 \dashrightarrow 00:03:36.109$  So we look forward to many more years

NOTE Confidence: 0.936899033333333

 $00{:}03{:}36{.}109 \dashrightarrow 00{:}03{:}38{.}827$  of of of comradeship and collaboration.

NOTE Confidence: 0.936899033333333

 $00{:}03{:}38{.}830 \dashrightarrow 00{:}03{:}41{.}210$  Congratulations on this award.

NOTE Confidence: 0.936899033333333

 $00:03:41.210 \longrightarrow 00:03:44.489$  And I'm going to keep

NOTE Confidence: 0.935780925555556

 $00:03:51.370 \longrightarrow 00:03:52.114$  you this down.

NOTE Confidence: 0.935780925555556

 $00:03:52.114 \rightarrow 00:03:54.103$  Thank you so much for that introduction.

NOTE Confidence: 0.935780925555556

 $00:03:54.103 \longrightarrow 00:03:56.568$  I feel really, really humbled

- NOTE Confidence: 0.935780925555556
- $00:03:56.570 \longrightarrow 00:03:58.688$  and and grateful to be here.
- NOTE Confidence: 0.93578092555556
- $00:03:58.690 \longrightarrow 00:04:00.286$  Thank you to the most high.
- NOTE Confidence: 0.93578092555556
- 00:04:00.290 --> 00:04:01.970 Thank you to my family for being here,
- NOTE Confidence: 0.93578092555556
- 00:04:01.970 --> 00:04:04.546 my mom, sister, my nephew who you've
- NOTE Confidence: 0.93578092555556
- $00:04:04.546 \longrightarrow 00:04:06.434$  already heard from my brother,
- NOTE Confidence: 0.935780925555556
- $00:04:06.434 \longrightarrow 00:04:08.394$  my wife watching online and
- NOTE Confidence: 0.93578092555556
- $00:04:08.394 \rightarrow 00:04:09.900$  other family support and.
- NOTE Confidence: 0.935780925555556
- 00:04:09.900 --> 00:04:12.306 Thank you to the Lesman family
- NOTE Confidence: 0.935780925555556
- $00:04:12.306 \longrightarrow 00:04:14.415$  and the committee and this
- NOTE Confidence: 0.93578092555556
- $00:04:14.415 \rightarrow 00:04:16.935$  community which has been an amazing
- NOTE Confidence: 0.935780925555556
- $00:04:16.935 \longrightarrow 00:04:19.084$  place to to be for residency.
- NOTE Confidence: 0.935780925555556
- $00:04:19.084 \longrightarrow 00:04:21.390$  We're going to talk a little bit
- NOTE Confidence: 0.935780925555556
- 00:04:21.390 --> 00:04:23.380 about some of my work that takes
- NOTE Confidence: 0.93578092555556
- $00{:}04{:}23.380 \dashrightarrow 00{:}04{:}24.580$  a computational framework and
- NOTE Confidence: 0.935780925555556
- $00:04:24.580 \longrightarrow 00:04:26.638$  looking to see how can we better
- NOTE Confidence: 0.935780925555556

 $00{:}04{:}26.638 \dashrightarrow 00{:}04{:}28.252$  understand that the code the brain

NOTE Confidence: 0.935780925555556

 $00:04:28.252 \rightarrow 00:04:30.177$  uses to represent social information

NOTE Confidence: 0.93578092555556

00:04:30.177 --> 00:04:31.777 across different model systems?

NOTE Confidence: 0.93578092555556

 $00:04:31.780 \rightarrow 00:04:33.236$  And then how might we then use

NOTE Confidence: 0.935780925555556

 $00:04:33.236 \longrightarrow 00:04:35.254$  that to be able to start treating

NOTE Confidence: 0.935780925555556

 $00:04:35.254 \rightarrow 00:04:36.256$  mental health symptoms?

NOTE Confidence: 0.946962533333333

00:04:38.610 --> 00:04:39.570 These are my conflict of interest,

NOTE Confidence: 0.946962533333333

 $00{:}04{:}39{.}570 \dashrightarrow 00{:}04{:}41{.}082$  which are not relevant to the work

NOTE Confidence: 0.946962533333333

 $00{:}04{:}41{.}082 \dashrightarrow 00{:}04{:}42{.}290$  that I'm talking about today,

NOTE Confidence: 0.946962533333333

 $00:04:42.290 \longrightarrow 00:04:44.330$  but is to other research.

NOTE Confidence: 0.946962533333333

00:04:44.330 --> 00:04:46.138 And I'm going to start by just setting

NOTE Confidence: 0.946962533333333

 $00{:}04{:}46.138 \dashrightarrow 00{:}04{:}47.919$  a basic frame ground in some of the

NOTE Confidence: 0.946962533333333

 $00{:}04{:}47{.}919 \dashrightarrow 00{:}04{:}49{.}820$  work that I did during grad school and

NOTE Confidence: 0.9469625333333333

 $00:04:49.820 \dashrightarrow 00:04:51.928$  post that because it kind of sets up

NOTE Confidence: 0.946962533333333

 $00:04:51.928 \longrightarrow 00:04:54.320$  the problem that I then was looking to

NOTE Confidence: 0.946962533333333

 $00:04:54.385 \rightarrow 00:04:57.049$  solve with this project during residency.

- NOTE Confidence: 0.946962533333333
- $00{:}04{:}57{.}050 \dashrightarrow 00{:}04{:}59{.}482$  And the solution that we're working with is
- NOTE Confidence: 0.946962533333333
- 00:04:59.482 --> 00:05:01.489 called Function Functional Encoding Units.
- NOTE Confidence: 0.946962533333333
- $00:05:01.490 \longrightarrow 00:05:03.149$  I'll talk about why we think this
- NOTE Confidence: 0.946962533333333
- $00:05:03.149 \longrightarrow 00:05:05.404$  might be a really useful way to
- NOTE Confidence: 0.946962533333333
- $00:05:05.404 \rightarrow 00:05:06.888$  help represent neural information.
- NOTE Confidence: 0.946962533333333
- $00:05:06.890 \rightarrow 00:05:08.409$  But before we get into the data,
- NOTE Confidence: 0.946962533333333
- 00:05:08.410 --> 00:05:09.826 I just want to just kind of share
- NOTE Confidence: 0.946962533333333
- 00:05:09.826 --> 00:05:10.850 yields land acknowledgement,
- NOTE Confidence: 0.946962533333333
- $00:05:10.850 \longrightarrow 00:05:11.850$  which just says that,
- NOTE Confidence: 0.946962533333333
- $00{:}05{:}11.850 \dashrightarrow 00{:}05{:}13.642$  you know the cool research and cool
- NOTE Confidence: 0.946962533333333
- $00:05:13.642 \rightarrow 00:05:15.287$  community that we get to have and
- NOTE Confidence: 0.946962533333333
- $00{:}05{:}15.287 \dashrightarrow 00{:}05{:}17.458$  build comes that at a real price to to
- NOTE Confidence: 0.946962533333333
- $00:05:17.458 \dashrightarrow 00:05:19.526$  nations and people that we can't forget.
- NOTE Confidence: 0.946962533333333
- $00{:}05{:}19.530 \dashrightarrow 00{:}05{:}21.504$  That even as we celebrate the
- NOTE Confidence: 0.946962533333333
- $00:05:21.504 \rightarrow 00:05:23.571$  things that we're able to accomplish
- NOTE Confidence: 0.946962533333333

00:05:23.571 - 00:05:25.286 while here on this land,

NOTE Confidence: 0.946962533333333

 $00:05:25.290 \rightarrow 00:05:27.124$  it's amazing to be in this environment.

NOTE Confidence: 0.946962533333333

 $00{:}05{:}27.130 \dashrightarrow 00{:}05{:}28.733$ Because it's Chris said like I get

NOTE Confidence: 0.946962533333333

 $00:05:28.733 \rightarrow 00:05:30.489$  to kind of bring the spiritual,

NOTE Confidence: 0.946962533333333

 $00{:}05{:}30{.}490 \dashrightarrow 00{:}05{:}31{.}655$  the musical aspects of myself

NOTE Confidence: 0.946962533333333

 $00{:}05{:}31.655 \dashrightarrow 00{:}05{:}33.010$  into the work that I do.

NOTE Confidence: 0.946962533333333

00:05:33.010 --> 00:05:34.220 And even though I won't

NOTE Confidence: 0.946962533333333

 $00:05:34.220 \longrightarrow 00:05:35.188$  talk about that research.

NOTE Confidence: 0.946962533333333

 $00{:}05{:}35{.}190 \dashrightarrow 00{:}05{:}37{.}157$  It informs how I think about science

NOTE Confidence: 0.946962533333333

 $00{:}05{:}37{.}157 \dashrightarrow 00{:}05{:}39{.}055$  and what kinds of questions to ask

NOTE Confidence: 0.946962533333333

 $00{:}05{:}39{.}055 \dashrightarrow 00{:}05{:}41{.}074$  and how we might go about asking those

NOTE Confidence: 0.946962533333333

 $00:05:41.074 \rightarrow 00:05:42.908$  questions because I'm going to talk about,

NOTE Confidence: 0.946962533333333

00:05:42.910 --> 00:05:43.332 you know,

NOTE Confidence: 0.9469625333333333

 $00:05:43.332 \longrightarrow 00:05:44.809$  neurons in the brain while animals are

NOTE Confidence: 0.946962533333333

 $00:05:44.809 \dashrightarrow 00:05:46.508$  doing things and we're recording from them.

NOTE Confidence: 0.946962533333333

 $00{:}05{:}46{.}510 \dashrightarrow 00{:}05{:}47{.}931$  But none of that really gets at

- NOTE Confidence: 0.946962533333333
- $00:05:47.931 \rightarrow 00:05:49.309$  the hard problem of consciousness,
- NOTE Confidence: 0.946962533333333
- $00:05:49.310 \longrightarrow 00:05:51.430$  which is how do we have the specific
- NOTE Confidence: 0.946962533333333
- $00:05:51.430 \rightarrow 00:05:53.429$  quality of our conscious experience.
- NOTE Confidence: 0.946962533333333
- $00{:}05{:}53.430 \dashrightarrow 00{:}05{:}55.537$  And I think asking those kinds of
- NOTE Confidence: 0.946962533333333
- $00{:}05{:}55{.}537 \dashrightarrow 00{:}05{:}57{.}440$  questions really kind of push us
- NOTE Confidence: 0.946962533333333
- $00{:}05{:}57{.}440 \dashrightarrow 00{:}05{:}59{.}312$  towards these ideas of like quantum
- NOTE Confidence: 0.946962533333333
- $00:05:59.312 \rightarrow 00:06:00.948$  psychology and quantum psychiatry,
- NOTE Confidence: 0.946962533333333
- $00:06:00.950 \longrightarrow 00:06:01.670$  which I think.
- NOTE Confidence: 0.946962533333333
- $00{:}06{:}01{.}670 \dashrightarrow 00{:}06{:}03{.}350$  Might be very relevant to how we
- NOTE Confidence: 0.946962533333333
- $00{:}06{:}03{.}410 \dashrightarrow 00{:}06{:}04{.}698$  think about social information
- NOTE Confidence: 0.946962533333333
- $00:06:04.698 \rightarrow 00:06:06.630$  and the way that our experiences
- NOTE Confidence: 0.946962533333333
- $00:06:06.689 \dashrightarrow 00:06:08.379$  become entangled with each other.
- NOTE Confidence: 0.946962533333333
- $00:06:08.380 \longrightarrow 00:06:10.500$  And so with that frame,
- NOTE Confidence: 0.946962533333333
- 00:06:10.500 --> 00:06:12.252 I wanna jump into thinking about
- NOTE Confidence: 0.946962533333333
- $00{:}06{:}12.252 \dashrightarrow 00{:}06{:}14.459$  why we wanna study the social brain.
- NOTE Confidence: 0.946962533333333

 $00:06:14.460 \longrightarrow 00:06:17.162$  It's really at the heart of culture

NOTE Confidence: 0.946962533333333

 $00{:}06{:}17.162 \dashrightarrow 00{:}06{:}20.417$  and how we evolve our social norms.

NOTE Confidence: 0.946962533333333

00:06:20.420 --> 00:06:21.500 And many of the big problems

NOTE Confidence: 0.946962533333333

 $00:06:21.500 \longrightarrow 00:06:22.500$  we have to solve today,

NOTE Confidence: 0.946962533333333

 $00{:}06{:}22.500 \dashrightarrow 00{:}06{:}24.640$  like the coordination challenge around

NOTE Confidence: 0.946962533333333

 $00:06:24.640 \rightarrow 00:06:26.780$  climate crisis really will require

NOTE Confidence: 0.946962533333333

 $00:06:26.846 \longrightarrow 00:06:30.263$  us to be able to to evolve the ways

NOTE Confidence: 0.946962533333333

 $00:06:30.263 \rightarrow 00:06:32.230$  in which we socially relate to each

NOTE Confidence: 0.946962533333333

 $00{:}06{:}32.292 \dashrightarrow 00{:}06{:}33.872$  other to to guide group behavior.

NOTE Confidence: 0.946962533333333

 $00{:}06{:}33.872 \dashrightarrow 00{:}06{:}35.816$  And obviously as a clinician across

NOTE Confidence: 0.946962533333333

00:06:35.816 --> 00:06:37.787 a number of different diagnosis

NOTE Confidence: 0.946962533333333

00:06:37.787 --> 00:06:39.379 in psychiatry and neurology,

NOTE Confidence: 0.946962533333333

 $00:06:39.380 \rightarrow 00:06:41.300$  we see altered social cognition,

NOTE Confidence: 0.946962533333333

 $00:06:41.300 \longrightarrow 00:06:43.675$  some that even are somewhat

NOTE Confidence: 0.946962533333333

00:06:43.675 --> 00:06:46.699 defined by by alterations in in

NOTE Confidence: 0.946962533333333

 $00:06:46.699 \rightarrow 00:06:48.939$  social cognition and behavior.

- NOTE Confidence: 0.946962533333333
- $00:06:48.940 \longrightarrow 00:06:49.132$  But.
- NOTE Confidence: 0.946962533333333
- $00:06:49.132 \longrightarrow 00:06:50.668$  When we try to look at the brain
- NOTE Confidence: 0.946962533333333
- $00{:}06{:}50.668 \dashrightarrow 00{:}06{:}52.365$  and look at the kind of circuits
- NOTE Confidence: 0.946962533333333
- $00:06:52.365 \rightarrow 00:06:53.950$  and networks that might be involved,
- NOTE Confidence: 0.946962533333333
- $00{:}06{:}53.950 \dashrightarrow 00{:}06{:}55.590$  we're looking at the rodent brain on the
- NOTE Confidence: 0.946962533333333
- $00{:}06{:}55{.}590 \dashrightarrow 00{:}06{:}57{.}269$  left and the human brain on the right.
- NOTE Confidence: 0.946962533333333
- 00:06:57.270 --> 00:06:58.998 It's it's very complex and many
- NOTE Confidence: 0.946962533333333
- $00{:}06{:}58{.}998 \dashrightarrow 00{:}07{:}00{.}775$  of these regions do things that
- NOTE Confidence: 0.946962533333333
- $00:07:00.775 \longrightarrow 00:07:02.185$  are non social as well.
- NOTE Confidence: 0.946962533333333
- $00:07:02.190 \longrightarrow 00:07:03.372$  And so one of the things
- NOTE Confidence: 0.946962533333333
- $00:07:03.372 \longrightarrow 00:07:04.160$  that appealed to me
- NOTE Confidence: 0.941259939999999
- 00:07:04.211 --> 00:07:05.609 during Graduate School was this idea
- NOTE Confidence: 0.941259939999999
- $00{:}07{:}05{.}609 \dashrightarrow 00{:}07{:}07{.}356$  that we can use systems near science
- NOTE Confidence: 0.941259939999999
- $00{:}07{:}07{.}356 \dashrightarrow 00{:}07{:}09{.}141$  tools like optogenetics to look at a
- NOTE Confidence: 0.941259939999999
- $00{:}07{:}09{.}150 \dashrightarrow 00{:}07{:}11{.}160$  specific circuit and ask what that
- NOTE Confidence: 0.941259939999999

 $00{:}07{:}11{.}160 \dashrightarrow 00{:}07{:}13{.}175$  circuit does in some behavior and

NOTE Confidence: 0.941259939999999

00:07:13.175 --> 00:07:15.310 then from there build build up a

NOTE Confidence: 0.941259939999999

 $00:07:15.310 \longrightarrow 00:07:16.498$  circuit understanding of behavior.

NOTE Confidence: 0.941259939999999

 $00:07:16.498 \longrightarrow 00:07:18.881$  And so I wanted to apply this to

NOTE Confidence: 0.941259939999999

 $00:07:18.881 \rightarrow 00:07:20.507$  social behavior for my thesis work.

NOTE Confidence: 0.941259939999999

 $00:07:20.510 \dashrightarrow 00:07:22.198$  And so to kind of reduce our framework NOTE Confidence: 0.941259939999999

 $00{:}07{:}22.198 \dashrightarrow 00{:}07{:}24.542$  to be able to make these kinds of

NOTE Confidence: 0.941259939999999

 $00:07:24.542 \rightarrow 00:07:25.790$  potential hypothesis and conclusions,

NOTE Confidence: 0.941259939999999

 $00{:}07{:}25.790 \dashrightarrow 00{:}07{:}27.841$  we focus on a specific element of

NOTE Confidence: 0.941259939999999

 $00:07:27.841 \rightarrow 00:07:29.022$  social behavior, social learning.

NOTE Confidence: 0.941259939999999

 $00{:}07{:}29{.}022 \dashrightarrow 00{:}07{:}31{.}094$  It's so critical for animals to be

NOTE Confidence: 0.941259939999999

 $00:07:31.094 \rightarrow 00:07:33.353$  able to learn about things in the

NOTE Confidence: 0.941259939999999

 $00:07:33.353 \rightarrow 00:07:34.621$  environment that are happening,

NOTE Confidence: 0.941259939999999

 $00:07:34.630 \dashrightarrow 00:07:36.115$  specifically the kinds of things

NOTE Confidence: 0.941259939999999

 $00:07:36.115 \longrightarrow 00:07:37.560$  that they should avoid, right.

NOTE Confidence: 0.941259939999999

 $00:07:37.560 \rightarrow 00:07:39.310$  There's a high cost to certain lessons

- NOTE Confidence: 0.941259939999999
- $00:07:39.310 \longrightarrow 00:07:41.420$  and you want to be able to use the
- NOTE Confidence: 0.941259939999999
- $00:07:41.420 \rightarrow 00:07:43.040$  experiences of other animals to learn.
- NOTE Confidence: 0.941259939999999
- $00:07:43.040 \longrightarrow 00:07:44.750$  So while this baby element has
- NOTE Confidence: 0.941259939999999
- $00:07:44.750 \rightarrow 00:07:45.990$  definitely been traumatized,
- NOTE Confidence: 0.941259939999999
- $00:07:45.990 \rightarrow 00:07:47.976$  it hasn't been physically injured and
- NOTE Confidence: 0.941259939999999
- $00:07:47.976 \longrightarrow 00:07:50.190$  that gives it some a much harder.
- NOTE Confidence: 0.941259939999999
- 00:07:50.190 --> 00:07:51.374 Higher chance of survival.
- NOTE Confidence: 0.941259939999999
- $00:07:51.374 \rightarrow 00:07:53.150$  And we already knew from experimental
- NOTE Confidence: 0.941259939999999
- $00{:}07{:}53.204 \dashrightarrow 00{:}07{:}54.686$  paradigms in the past that rodents
- NOTE Confidence: 0.941259939999999
- 00:07:54.686 --> 00:07:56.638 will do this, that kind of behavior,
- NOTE Confidence: 0.941259939999999
- $00:07:56.638 \rightarrow 00:07:59.074$  and you can measure it in a lab setting.
- NOTE Confidence: 0.941259939999999
- $00{:}07{:}59{.}074 \dashrightarrow 00{:}08{:}01{.}185$  And we knew that areas like the amygdala
- NOTE Confidence: 0.941259939999999
- $00:08:01.185 \rightarrow 00:08:03.509$  and the anterior single cortex were involved,
- NOTE Confidence: 0.941259939999999
- 00:08:03.510 --> 00:08:04.746 because if you do something like
- NOTE Confidence: 0.941259939999999
- $00{:}08{:}04.746 \dashrightarrow 00{:}08{:}06.049$  put lidocaine in those regions so
- NOTE Confidence: 0.941259939999999

 $00:08:06.049 \rightarrow 00:08:07.144$  that they're no longer active,

NOTE Confidence: 0.941259939999999

 $00:08:07.150 \longrightarrow 00:08:08.470$  animals aren't able to learn.

NOTE Confidence: 0.941259939999999

 $00:08:08.470 \longrightarrow 00:08:09.800$  And you can see that in this

NOTE Confidence: 0.941259939999999

00:08:09.800 - 00:08:11.821 white line here where freezing is,

NOTE Confidence: 0.941259939999999

 $00{:}08{:}11.821 \dashrightarrow 00{:}08{:}13.776$  is on the Y axis.

NOTE Confidence: 0.941259939999999

 $00{:}08{:}13.780 \dashrightarrow 00{:}08{:}15.110$  So we also knew that in humans

NOTE Confidence: 0.941259939999999

00:08:15.110 - 00:08:16.060 these same two regions,

NOTE Confidence: 0.941259939999999

 $00:08:16.060 \rightarrow 00:08:17.416$  anterior singlet cortex and the mega,

NOTE Confidence: 0.941259939999999

 $00:08:17.420 \rightarrow 00:08:19.240$  are involved in social learning and there's

NOTE Confidence: 0.941259939999999

 $00:08:19.240 \longrightarrow 00:08:20.939$  just showing you one example of that.

NOTE Confidence: 0.941259939999999

 $00{:}08{:}20{.}940 \dashrightarrow 00{:}08{:}22{.}179$  And so let's zoom in a little

NOTE Confidence: 0.941259939999999

 $00:08:22.179 \longrightarrow 00:08:23.260$  bit on those two regions.

NOTE Confidence: 0.941259939999999

 $00{:}08{:}23.260 \dashrightarrow 00{:}08{:}27.450$  The cingulate is an area that seems to

NOTE Confidence: 0.941259939999999

 $00:08:27.450 \longrightarrow 00:08:29.200$  be kind of in between the subcortical

NOTE Confidence: 0.941259939999999

 $00:08:29.250 \rightarrow 00:08:30.750$  and cortical regions in certain ways

NOTE Confidence: 0.941259939999999

 $00:08:30.750 \longrightarrow 00:08:32.830$  and it kind of can be thought of as

 $00:08:32.830 \longrightarrow 00:08:34.859$  a self other hub that helps to look

NOTE Confidence: 0.941259939999999

 $00:08:34.859 \dashrightarrow 00:08:36.524$  at contingencies in the environment

NOTE Confidence: 0.941259939999999

 $00:08:36.524 \rightarrow 00:08:38.800$  and then make appropriate decisions.

NOTE Confidence: 0.941259939999999

 $00:08:38.800 \rightarrow 00:08:41.344$  The amygdala again also has some degree of

NOTE Confidence: 0.941259939999999

 $00:08:41.344 \rightarrow 00:08:43.358$  homology across different model systems.

NOTE Confidence: 0.941259939999999

 $00{:}08{:}43{.}360 \dashrightarrow 00{:}08{:}45{.}925$  And now we think of it as sort of

NOTE Confidence: 0.941259939999999

 $00:08:45.925 \dashrightarrow 00:08:48.476$  a behavioral hub where appropriate

NOTE Confidence: 0.941259939999999

 $00{:}08{:}48{.}476 \dashrightarrow 00{:}08{:}51{.}395$  actions can be initiated depending on

NOTE Confidence: 0.941259939999999

 $00:08:51.395 \rightarrow 00:08:53.520$  the right stimuli and associations.

NOTE Confidence: 0.941259939999999

00:08:53.520 --> 00:08:55.200 And so they seem to be reasons that

NOTE Confidence: 0.941259939999999

 $00:08:55.200 \rightarrow 00:08:57.204$  would be important for this kind of behavior.

NOTE Confidence: 0.941259939999999

 $00{:}08{:}57{.}204 \dashrightarrow 00{:}08{:}57{.}488$  OK.

NOTE Confidence: 0.941259939999999

 $00{:}08{:}57{.}488 \dashrightarrow 00{:}08{:}59{.}476$  So we know that they're important for

NOTE Confidence: 0.941259939999999

 $00:08:59.476 \dashrightarrow 00:09:01.133$  social learning in rodents, primates.

NOTE Confidence: 0.941259939999999

 $00:09:01.133 \dashrightarrow 00:09:04.130$  I didn't show you that data and also humans.

 $00:09:04.130 \rightarrow 00:09:06.139$  And we knew that they have anatomically

NOTE Confidence: 0.941259939999999

 $00{:}09{:}06.139 \dashrightarrow 00{:}09{:}07.530$  reciprocal connections to each other.

NOTE Confidence: 0.941259939999999

 $00:09:07.530 \longrightarrow 00:09:09.843$  And so a large part of my thesis work

NOTE Confidence: 0.941259939999999

 $00:09:09.843 \rightarrow 00:09:11.838$  was looking in a specific version

NOTE Confidence: 0.941259939999999

 $00:09:11.838 \dashrightarrow 00:09:13.926$  of social learning in rodents and

NOTE Confidence: 0.941259939999999

 $00:09:13.926 \dashrightarrow 00:09:16.626$  asking how do neurons actually encode

NOTE Confidence: 0.941259939999999

 $00:09:16.626 \dashrightarrow 00:09:18.138$  information during this paradigm.

NOTE Confidence: 0.941259939999999

 $00:09:18.138 \rightarrow 00:09:19.706$  So I'll show you what this paradigm

NOTE Confidence: 0.941259939999999

 $00{:}09{:}19{.}706 \dashrightarrow 00{:}09{:}21{.}354$  is because it sets A-frame for the

NOTE Confidence: 0.941259939999999

 $00:09:21.354 \rightarrow 00:09:22.718$  some of the analytical tools that

NOTE Confidence: 0.941259939999999

 $00:09:22.718 \longrightarrow 00:09:24.518$  I'll show you in a little bit.

NOTE Confidence: 0.941259939999999

 $00{:}09{:}24.518 \dashrightarrow 00{:}09{:}26.300$  And so here an observer mouse

NOTE Confidence: 0.941259939999999

 $00{:}09{:}26.371 \dashrightarrow 00{:}09{:}27.727$  receives 1 foot shot.

NOTE Confidence: 0.941259939999999

 $00{:}09{:}27.730 \dashrightarrow 00{:}09{:}29.415$  It's then transferred to a

NOTE Confidence: 0.941259939999999

 $00:09:29.415 \longrightarrow 00:09:31.100$  plastic floor where it will

NOTE Confidence: 0.90604308125

 $00:09:31.166 \rightarrow 00:09:33.290$  no longer receive any foot shocks.

 $00:09:33.290 \rightarrow 00:09:34.690$  And then a demonstrator mouse who's a cage,

NOTE Confidence: 0.90604308125

 $00{:}09{:}34.690 \dashrightarrow 00{:}09{:}37.161$  made this place and it goes undergoes

NOTE Confidence: 0.90604308125

00:09:37.161 --> 00:09:39.330 basically Pavlovian cue fear conditioning,

NOTE Confidence: 0.90604308125

 $00:09:39.330 \longrightarrow 00:09:40.752$  where a cue predicts the delivery

NOTE Confidence: 0.90604308125

 $00:09:40.752 \longrightarrow 00:09:42.329$  of for shock to that animal.

NOTE Confidence: 0.90604308125

 $00{:}09{:}42.330 \dashrightarrow 00{:}09{:}44.031$  We can then test that animal on

NOTE Confidence: 0.90604308125

 $00:09:44.031 \rightarrow 00:09:45.979$  its own where we just play the cue

NOTE Confidence: 0.90604308125

 $00:09:45.979 \dashrightarrow 00:09:47.849$  and ask does it freeze to that cue.

NOTE Confidence: 0.90604308125

 $00{:}09{:}47.850 \dashrightarrow 00{:}09{:}49.614$  If it does, we're saying it learned

NOTE Confidence: 0.90604308125

 $00:09:49.614 \rightarrow 00:09:50.668$  that association through the

NOTE Confidence: 0.90604308125

 $00:09:50.668 \rightarrow 00:09:51.928$  experience of the other animals.

NOTE Confidence: 0.90604308125

 $00{:}09{:}51{.}930 \dashrightarrow 00{:}09{:}52{.}968$  We did a number of controls.

NOTE Confidence: 0.90604308125

 $00:09:52.970 \dashrightarrow 00:09:54.965$  I won't show you to really convince

NOTE Confidence: 0.90604308125

 $00{:}09{:}54{.}965 \dashrightarrow 00{:}09{:}57{.}037$  ourselves that that is indeed what was

NOTE Confidence: 0.90604308125

 $00{:}09{:}57{.}037 \dashrightarrow 00{:}09{:}58{.}890$  happening at the behavioral level. OK.

 $00{:}09{:}58.890 \dashrightarrow 00{:}10{:}00.642$  So now we wanted to record from these

NOTE Confidence: 0.90604308125

00:10:00.642 --> 00:10:01.887 neurons using in vivo electrophysiology

NOTE Confidence: 0.90604308125

 $00:10:01.887 \longrightarrow 00:10:03.405$  to ask what are they doing,

NOTE Confidence: 0.90604308125

 $00:10:03.410 \longrightarrow 00:10:04.810$  doing this kind of task.

NOTE Confidence: 0.90604308125

 $00{:}10{:}04{.}810 \dashrightarrow 00{:}10{:}06{.}520$  And we'll add this period called

NOTE Confidence: 0.90604308125

 $00:10:06.520 \longrightarrow 00:10:08.338$  habituation here in the Gray where

NOTE Confidence: 0.90604308125

 $00:10:08.338 \rightarrow 00:10:10.210$  we're giving cues to the demonstrator,

NOTE Confidence: 0.90604308125

 $00:10:10.210 \rightarrow 00:10:12.328$  but they don't predict anything happening.

NOTE Confidence: 0.90604308125

 $00{:}10{:}12{.}330 \dashrightarrow 00{:}10{:}14{.}087$  And so those cues have no meaning.

NOTE Confidence: 0.90604308125

 $00{:}10{:}14.090 \dashrightarrow 00{:}10{:}15.415$  Then we'll start actually paying

NOTE Confidence: 0.90604308125

 $00{:}10{:}15{.}415 \dashrightarrow 00{:}10{:}17{.}115$  them to shock of the demonstrator

NOTE Confidence: 0.90604308125

00:10:17.115 --> 00:10:19.065 and asking how do neurons change

NOTE Confidence: 0.90604308125

 $00:10:19.065 \rightarrow 00:10:20.556$  as animals actually learning that

NOTE Confidence: 0.90604308125

 $00:10:20.556 \longrightarrow 00:10:22.322$  this cue has a predictive value.

NOTE Confidence: 0.90604308125

 $00{:}10{:}22.322 \dashrightarrow 00{:}10{:}23.570$  And so first,

NOTE Confidence: 0.90604308125

 $00:10:23.570 \longrightarrow 00:10:24.834$  I just want to give you the sense

- NOTE Confidence: 0.90604308125
- $00:10:24.834 \rightarrow 00:10:25.944$  these are rasters basically showing
- NOTE Confidence: 0.90604308125
- $00:10:25.944 \rightarrow 00:10:27.204$  what these neurons are doing,
- NOTE Confidence: 0.90604308125
- $00:10:27.210 \longrightarrow 00:10:27.783$  doing this behavior.
- NOTE Confidence: 0.90604308125
- 00:10:27.783 --> 00:10:29.395 And I just want to show you that
- NOTE Confidence: 0.90604308125
- $00:10:29.395 \rightarrow 00:10:30.775$  these neurons are responding to the
- NOTE Confidence: 0.90604308125
- $00{:}10{:}30{.}775 \dashrightarrow 00{:}10{:}32{.}464$  things that we need for animals to
- NOTE Confidence: 0.90604308125
- 00:10:32.464 --> 00:10:33.360 make these associations, right?
- NOTE Confidence: 0.90604308125
- $00{:}10{:}33{.}360 \dashrightarrow 00{:}10{:}35{.}838$  The cue, the shock of the demonstrator.
- NOTE Confidence: 0.90604308125
- $00:10:35.840 \rightarrow 00:10:37.265$  And some neurons actually even
- NOTE Confidence: 0.90604308125
- $00:10:37.265 \longrightarrow 00:10:38.120$  respond to both.
- NOTE Confidence: 0.90604308125
- $00{:}10{:}38{.}120 \dashrightarrow 00{:}10{:}39{.}960$  But I want you to already notice that
- NOTE Confidence: 0.90604308125
- $00{:}10{:}39{.}960 \dashrightarrow 00{:}10{:}41{.}609$  the actual sort of even aesthetics
- NOTE Confidence: 0.90604308125
- $00{:}10{:}41.609 \dashrightarrow 00{:}10{:}43.307$  of these waveforms and rasters look
- NOTE Confidence: 0.90604308125
- $00{:}10{:}43.364 \dashrightarrow 00{:}10{:}45.239$  different across the different neurons,
- NOTE Confidence: 0.90604308125
- $00{:}10{:}45{.}240 \dashrightarrow 00{:}10{:}46{.}850$  even if they're representing quote,
- NOTE Confidence: 0.90604308125

 $00:10:46.850 \rightarrow 00:10:49.140$  UN quote, the same thing.

NOTE Confidence: 0.90604308125

 $00:10:49.140 \longrightarrow 00:10:51.012$  We were really interested in these

NOTE Confidence: 0.90604308125

 $00:10:51.012 \longrightarrow 00:10:52.260$  neurons that during habituation

NOTE Confidence: 0.90604308125

 $00:10:52.313 \rightarrow 00:10:54.700$  seemed to not really have a strong

NOTE Confidence: 0.90604308125

 $00{:}10{:}54{.}700 \dashrightarrow 00{:}10{:}55{.}820$  response to the cue.

NOTE Confidence: 0.90604308125

 $00:10:55.820 \longrightarrow 00:10:57.122$  But then when animals are actually

NOTE Confidence: 0.90604308125

 $00:10:57.122 \rightarrow 00:10:58.418$  learning about the meaning of the cue,

NOTE Confidence: 0.90604308125

 $00:10:58.420 \rightarrow 00:10:59.940$  these neurons start to respond.

NOTE Confidence: 0.90604308125

 $00{:}10{:}59{.}940 \dashrightarrow 00{:}11{:}02{.}140$  So these are the kinds of neurons that

NOTE Confidence: 0.90604308125

 $00{:}11{:}02{.}140 \dashrightarrow 00{:}11{:}03{.}406$  might actually represent learning

NOTE Confidence: 0.90604308125

 $00{:}11{:}03.406 \dashrightarrow 00{:}11{:}05.066$  because they change their response

NOTE Confidence: 0.90604308125

 $00:11:05.066 \rightarrow 00:11:07.359$  to the cue as animals are learning.

NOTE Confidence: 0.90604308125

 $00{:}11{:}07{.}360 \dashrightarrow 00{:}11{:}09{.}583$  And so we honed in on these neurons and

NOTE Confidence: 0.90604308125

 $00:11:09.583 \rightarrow 00:11:12.096$  we wanted to take a tool from engineering.

NOTE Confidence: 0.90604308125

 $00:11:12.096 \rightarrow 00:11:14.797$  This is the same kind of tool that

NOTE Confidence: 0.90604308125

00:11:14.797 --> 00:11:17.118 we use to look at GPS and ask,

- NOTE Confidence: 0.90604308125
- $00{:}11{:}17{.}120 \dashrightarrow 00{:}11{:}19{.}144$  can we use this sort of state space
- NOTE Confidence: 0.90604308125
- 00:11:19.144 --> 00:11:20.747 approach to model how neurons are
- NOTE Confidence: 0.90604308125
- 00:11:20.747 --> 00:11:22.680 not just firing at a given trial,
- NOTE Confidence: 0.90604308125
- $00:11:22.680 \rightarrow 00:11:25.146$  but how they actually change their
- NOTE Confidence: 0.90604308125
- 00:11:25.146 --> 00:11:27.220 firing during this sort of task?
- NOTE Confidence: 0.90604308125
- $00{:}11{:}27{.}220 \dashrightarrow 00{:}11{:}29{.}802$  And it also allows us to get some
- NOTE Confidence: 0.90604308125
- $00{:}11{:}29.802 \dashrightarrow 00{:}11{:}31.854$  confidence about what these estimates are.
- NOTE Confidence: 0.90604308125
- $00:11:31.860 \rightarrow 00:11:34.380$  And so we can take the actual neuronal data,
- NOTE Confidence: 0.90604308125
- $00:11:34.380 \longrightarrow 00:11:35.460$  run it through our model,
- NOTE Confidence: 0.90604308125
- $00:11:35.460 \longrightarrow 00:11:37.899$  and it provides us an estimate at each trial.
- NOTE Confidence: 0.90604308125
- 00:11:37.900 --> 00:11:38.932 And then over time,
- NOTE Confidence: 0.90604308125
- $00:11:38.932 \rightarrow 00:11:40.900$  we can track how these neurons change.
- NOTE Confidence: 0.90604308125
- 00:11:40.900 --> 00:11:41.620 Just like a G PS:,
- NOTE Confidence: 0.90604308125
- 00:11:41.620 --> 00:11:43.458 can track sort of your trajectory
- NOTE Confidence: 0.90604308125
- $00{:}11{:}43.460 \dashrightarrow 00{:}11{:}46.540$  along a certain a certain path.
- NOTE Confidence: 0.90604308125

 $00{:}11{:}46{.}540 \dashrightarrow 00{:}11{:}48{.}100$  So this is for one neuron.

NOTE Confidence: 0.90604308125

 $00{:}11{:}48.100 \dashrightarrow 00{:}11{:}50.382$  It allows us to identify when do

NOTE Confidence: 0.90604308125

 $00:11:50.382 \rightarrow 00:11:51.780$  these neurons actually learn.

NOTE Confidence: 0.90604308125

00:11:51.780 --> 00:11:53.110 But I want you to appreciate here

NOTE Confidence: 0.90604308125

 $00{:}11{:}53{.}110 \dashrightarrow 00{:}11{:}53{.}680$  that when we

NOTE Confidence: 0.924827435333333

 $00:11:53.726 \rightarrow 00:11:55.336$  record from multiple different neurons,

NOTE Confidence: 0.924827435333333

 $00:11:55.340 \longrightarrow 00:11:57.405$  we kind of run into a problem.

NOTE Confidence: 0.924827435333333

 $00:11:57.410 \longrightarrow 00:11:59.490$  You can look again just looking at the

NOTE Confidence: 0.924827435333333

 $00{:}11{:}59{.}490 \dashrightarrow 00{:}12{:}01{.}267$  waveforms and the rasters that neurons

NOTE Confidence: 0.924827435333333

 $00{:}12{:}01{.}267 \dashrightarrow 00{:}12{:}03{.}067$  that are excited or inhibited don't

NOTE Confidence: 0.924827435333333

 $00{:}12{:}03{.}125 \dashrightarrow 00{:}12{:}04{.}925$  all do that in exactly the same way.

NOTE Confidence: 0.924827435333333

 $00:12:04.930 \longrightarrow 00:12:06.610$  And so we can take a gross approach and say,

NOTE Confidence: 0.924827435333333

 $00{:}12{:}06.610 \dashrightarrow 00{:}12{:}08.045$  well, all of these neurons are inhibited,

NOTE Confidence: 0.924827435333333

 $00:12:08.050 \longrightarrow 00:12:09.450$  all these neurons are excited.

NOTE Confidence: 0.924827435333333

 $00{:}12{:}09{.}450 \dashrightarrow 00{:}12{:}11{.}459$  We can say these neurons have basic

NOTE Confidence: 0.924827435333333

 $00:12:11.459 \rightarrow 00:12:13.729$  responses or they have sustained responses.

 $00:12:13.730 \longrightarrow 00:12:15.676$  But that seems like a very gross

NOTE Confidence: 0.924827435333333

 $00:12:15.676 \rightarrow 00:12:17.567$  level of analysis and unlikely to be

NOTE Confidence: 0.924827435333333

 $00:12:17.567 \longrightarrow 00:12:19.561$  the code that the brain is actually

NOTE Confidence: 0.924827435333333

 $00:12:19.561 \rightarrow 00:12:21.736$  using to represent social information.

NOTE Confidence: 0.924827435333333

 $00:12:21.740 \rightarrow 00:12:23.740$  If we dig down into each individual neuron,

NOTE Confidence: 0.924827435333333

 $00:12:23.740 \longrightarrow 00:12:26.302$  then it's also difficult to understand

NOTE Confidence: 0.924827435333333

 $00:12:26.302 \longrightarrow 00:12:28.340$  how each individual neuron will

NOTE Confidence: 0.924827435333333

 $00:12:28.340 \longrightarrow 00:12:29.696$  contribute to some sort of code.

NOTE Confidence: 0.924827435333333

00:12:29.700 --> 00:12:31.380 And so the idea that we had was,

NOTE Confidence: 0.924827435333333

 $00:12:31.380 \longrightarrow 00:12:33.123$  can we take the same kind of

NOTE Confidence: 0.924827435333333

00:12:33.123 --> 00:12:34.380 state space modeling approach,

NOTE Confidence: 0.924827435333333

00:12:34.380 --> 00:12:36.288 but combine it with unsupervised clustering

NOTE Confidence: 0.924827435333333

 $00{:}12{:}36.288 \dashrightarrow 00{:}12{:}38.428$  approaches so that we can figure out

NOTE Confidence: 0.924827435333333

 $00:12:38.428 \longrightarrow 00:12:40.060$  in any given population of neurons,

NOTE Confidence: 0.924827435333333

 $00:12:40.060 \rightarrow 00:12:41.854$  which ones are actually belonging together

 $00:12:41.854 \rightarrow 00:12:44.338$  in terms of how they functional respond?

NOTE Confidence: 0.924827435333333

 $00{:}12{:}44{.}340 \dashrightarrow 00{:}12{:}46{.}230$  Because these might be the putative

NOTE Confidence: 0.924827435333333

 $00:12:46.230 \rightarrow 00:12:47.847$  actually units that are encoding

NOTE Confidence: 0.924827435333333

 $00{:}12{:}47.847 \dashrightarrow 00{:}12{:}49.641$  the kind of information that the

NOTE Confidence: 0.924827435333333

 $00{:}12{:}49.641 \dashrightarrow 00{:}12{:}50.970$  brain needs to encode.

NOTE Confidence: 0.924827435333333

 $00{:}12{:}50{.}970$  -->  $00{:}12{:}54{.}587$  And so I teamed up with Alexander Lynn and NOTE Confidence: 0.924827435333333

10112 Connuclice: 0.524021450555555

 $00{:}12{:}54.587 \dashrightarrow 00{:}12{:}57.825$  and then Baba to create this pipeline for

NOTE Confidence: 0.924827435333333

 $00:12:57.825 \rightarrow 00:13:00.365$  creating these functional encoding units.

NOTE Confidence: 0.924827435333333

 $00{:}13{:}00{.}370 \dashrightarrow 00{:}13{:}02{.}507$  And so we can model the rate of each

NOTE Confidence: 0.924827435333333

00:13:02.507 -> 00:13:04.049 neuron like I showed you before.

NOTE Confidence: 0.924827435333333

 $00{:}13{:}04.050 \dashrightarrow 00{:}13{:}05.898$  Then we're going to use an unsupervised

NOTE Confidence: 0.924827435333333

 $00{:}13{:}05{.}898 \dashrightarrow 00{:}13{:}07{.}279$  clustering approach to figure out

NOTE Confidence: 0.924827435333333

 $00:13:07.279 \longrightarrow 00:13:08.644$  within this population of neurons,

NOTE Confidence: 0.924827435333333

 $00:13:08.650 \rightarrow 00:13:10.762$  which neurons go together in terms

NOTE Confidence: 0.924827435333333

 $00:13:10.762 \longrightarrow 00:13:12.170$  of how they respond.

NOTE Confidence: 0.924827435333333

 $00{:}13{:}12{.}170 \dashrightarrow 00{:}13{:}14{.}266$  And then this allows us to derive

 $00:13:14.266 \longrightarrow 00:13:15.770$  what the functional ensembles

NOTE Confidence: 0.924827435333333

 $00:13:15.770 \longrightarrow 00:13:17.650$  are within a given region.

NOTE Confidence: 0.924827435333333

 $00:13:17.650 \longrightarrow 00:13:18.694$  So the first thing we wanted

NOTE Confidence: 0.924827435333333

 $00:13:18.694 \rightarrow 00:13:20.210$  to do was to test this and say,

NOTE Confidence: 0.924827435333333

 $00{:}13{:}20{.}210 \dashrightarrow 00{:}13{:}21{.}722$  can it actually pull out ensembles

NOTE Confidence: 0.924827435333333

 $00:13:21.722 \rightarrow 00:13:23.688$  if we know what the ensembles are?

NOTE Confidence: 0.924827435333333

 $00{:}13{:}23.690 \dashrightarrow 00{:}13{:}26.090$  So we simulated 50 noisy neurons that we

NOTE Confidence: 0.924827435333333

 $00:13:26.090 \rightarrow 00:13:28.490$  know belong to five ground truth clusters.

NOTE Confidence: 0.924827435333333

 $00{:}13{:}28{.}490 \dashrightarrow 00{:}13{:}30{.}008$  Either they don't respond at all,

NOTE Confidence: 0.924827435333333

 $00:13:30.010 \longrightarrow 00:13:31.198$  they're excited either in

NOTE Confidence: 0.924827435333333

00:13:31.198 --> 00:13:32.683 a sustained or phasic way,

NOTE Confidence: 0.924827435333333

 $00{:}13{:}32.690 \dashrightarrow 00{:}13{:}35.567$  or they're inhibited either in a sustained,

NOTE Confidence: 0.924827435333333

 $00{:}13{:}35{.}570 \dashrightarrow 00{:}13{:}37{.}208$  yeah, a sustained or phasic way.

NOTE Confidence: 0.924827435333333

 $00{:}13{:}37{.}210 \dashrightarrow 00{:}13{:}39{.}780$  And we want to ask, can this pick it out?

NOTE Confidence: 0.924827435333333

 $00:13:39.780 \longrightarrow 00:13:40.620$  So before I show you that,

 $00:13:40.620 \rightarrow 00:13:42.044$  I just want to give you an example

NOTE Confidence: 0.924827435333333

 $00:13:42.044 \longrightarrow 00:13:43.534$  of what one of these functional

NOTE Confidence: 0.924827435333333

00:13:43.534 --> 00:13:44.899 encoding units actually look like.

NOTE Confidence: 0.924827435333333

 $00:13:44.900 \longrightarrow 00:13:47.620$  So this is an Fe from the ACC.

NOTE Confidence: 0.924827435333333

 $00{:}13{:}47.620 \dashrightarrow 00{:}13{:}49.364$  That's 36 neurons in it and each color

NOTE Confidence: 0.924827435333333

 $00:13:49.364 \longrightarrow 00:13:51.058$  is an individual neuron and these

NOTE Confidence: 0.924827435333333

 $00:13:51.058 \rightarrow 00:13:53.220$  rasters are just overlaid on each other.

NOTE Confidence: 0.924827435333333

 $00:13:53.220 \rightarrow 00:13:54.998$  And for those of you familiar with

NOTE Confidence: 0.924827435333333

00:13:54.998 --> 00:13:57.136 looking at this sort of in vivo EFIS data,

NOTE Confidence: 0.924827435333333

 $00:13:57.140 \rightarrow 00:13:59.177$  you'll see that it kind of resembles

NOTE Confidence: 0.924827435333333

 $00{:}13{:}59{.}177 \dashrightarrow 00{:}14{:}00{.}756$  what a native neuron excitatory

NOTE Confidence: 0.924827435333333

 $00{:}14{:}00{.}756 \dashrightarrow 00{:}14{:}01{.}940$  response would look like.

NOTE Confidence: 0.924827435333333

00:14:01.940 --> 00:14:02.740 It doesn't look like noise

NOTE Confidence: 0.924827435333333

 $00:14:02.740 \longrightarrow 00:14:03.380$  or anything like that.

NOTE Confidence: 0.924827435333333

 $00:14:03.380 \longrightarrow 00:14:06.196$  So this gives us some clue that we we

NOTE Confidence: 0.924827435333333

 $00:14:06.196 \rightarrow 00:14:07.930$  might be moving in the right direction.

- NOTE Confidence: 0.924827435333333
- 00:14:07.930 --> 00:14:08.157 OK,
- NOTE Confidence: 0.924827435333333
- $00{:}14{:}08{.}157 \dashrightarrow 00{:}14{:}10{.}200$  So what I'm going to show you here on
- NOTE Confidence: 0.924827435333333
- $00:14:10.263 \rightarrow 00:14:12.351$  the left is in green the parameters for
- NOTE Confidence: 0.924827435333333
- $00:14:12.351 \rightarrow 00:14:14.928$  each of these ensembles in the ground truth.
- NOTE Confidence: 0.924827435333333
- $00:14:14.930 \longrightarrow 00:14:16.490$  And so these two parameters,
- NOTE Confidence: 0.9055412325
- $00:14:16.490 \rightarrow 00:14:17.775$  which would be important because
- NOTE Confidence: 0.9055412325
- $00:14:17.775 \longrightarrow 00:14:19.411$  it allows us to actually make
- NOTE Confidence: 0.9055412325
- $00{:}14{:}19{.}411 \dashrightarrow 00{:}14{:}20{.}635$  intuitions and hypothesis about
- NOTE Confidence: 0.9055412325
- 00:14:20.635 00:14:22.165 what these ensembles are doing,
- NOTE Confidence: 0.9055412325
- 00:14:22.170 --> 00:14:23.862 are jump and phasicity.
- NOTE Confidence: 0.9055412325
- $00{:}14{:}23.862 \dashrightarrow 00{:}14{:}28.009$  So jump says when a neuron actually responds,
- NOTE Confidence: 0.9055412325
- $00:14:28.010 \longrightarrow 00:14:30.964$  how strong of a response is it,
- NOTE Confidence: 0.9055412325
- $00{:}14{:}30{.}970 \dashrightarrow 00{:}14{:}33{.}930$  and phasicity says how sustained.
- NOTE Confidence: 0.9055412325
- 00:14:33.930 --> 00:14:35.298 Or Phasic is responsive,
- NOTE Confidence: 0.9055412325
- $00{:}14{:}35{.}298 \dashrightarrow 00{:}14{:}37{.}342$  it's above 5, we'll say that's phasic.
- NOTE Confidence: 0.9055412325

- $00:14:37.342 \longrightarrow 00:14:38.607$  If it's lower than five,
- NOTE Confidence: 0.9055412325
- $00:14:38.610 \longrightarrow 00:14:40.690$  we'll say that that's sustained.
- NOTE Confidence: 0.9055412325
- $00:14:40.690 \longrightarrow 00:14:42.450$  And So what you can see here is
- NOTE Confidence: 0.9055412325
- $00:14:42.450 \longrightarrow 00:14:44.059$  that we're able to actually pull
- NOTE Confidence: 0.9055412325
- $00{:}14{:}44.059 \dashrightarrow 00{:}14{:}45.727$  out each of these five clusters
- NOTE Confidence: 0.9055412325
- $00{:}14{:}45.781 \dashrightarrow 00{:}14{:}47.249$  and estimate the parameters.
- NOTE Confidence: 0.9055412325
- $00:14:47.250 \rightarrow 00:14:48.890$  The parameter estimates aren't perfect,
- NOTE Confidence: 0.9055412325
- $00:14:48.890 \longrightarrow 00:14:51.308$  but they're close and relatively they
- NOTE Confidence: 0.9055412325
- 00:14:51.308 --> 00:14:53.520 retain the the relationship of the
- NOTE Confidence: 0.9055412325
- $00{:}14{:}53{.}520$  -->  $00{:}14{:}55{.}380$  ensembles and we have a 96% accuracy.
- NOTE Confidence: 0.9055412325
- $00{:}14{:}55{.}380 \dashrightarrow 00{:}14{:}57{.}235$  If you actually go into the data
- NOTE Confidence: 0.9055412325
- $00{:}14{:}57{.}235 \dashrightarrow 00{:}14{:}59{.}087$  where the algorithm makes a mistake,
- NOTE Confidence: 0.9055412325
- $00:14:59.090 \longrightarrow 00:14:59.918$  it actually.
- NOTE Confidence: 0.9055412325
- $00{:}14{:}59{.}918 \dashrightarrow 00{:}15{:}01{.}790$  Has low confidence in that estimate.
- NOTE Confidence: 0.9055412325
- $00{:}15{:}01.790 \dashrightarrow 00{:}15{:}03.540$  And so you could actually intuit
- NOTE Confidence: 0.9055412325
- $00{:}15{:}03.540 \dashrightarrow 00{:}15{:}05.080$  from the covariance matrix that

- NOTE Confidence: 0.9055412325
- $00:15:05.133 \rightarrow 00:15:06.876$  it might be making a mistake here.
- NOTE Confidence: 0.9055412325
- $00{:}15{:}06{.}880 \dashrightarrow 00{:}15{:}09{.}176$  And so this then just gives us
- NOTE Confidence: 0.9055412325
- $00{:}15{:}09{.}176 \dashrightarrow 00{:}15{:}10.596$  a graphical representation of
- NOTE Confidence: 0.9055412325
- $00:15:10.596 \longrightarrow 00:15:11.718$  that entire population.
- NOTE Confidence: 0.9055412325
- $00{:}15{:}11.720 \dashrightarrow 00{:}15{:}13.480$  And you can see when we pull out the rasters,
- NOTE Confidence: 0.9055412325
- $00:15:13.480 \longrightarrow 00:15:15.832$  we see those five responses inhibited
- NOTE Confidence: 0.9055412325
- 00:15:15.832 --> 00:15:17.720 in aphasic and sustained way,
- NOTE Confidence: 0.9055412325
- $00:15:17.720 \rightarrow 00:15:20.079$  excited in a sustained and phasic way,
- NOTE Confidence: 0.9055412325
- $00:15:20.080 \longrightarrow 00:15:20.780$  and nonresponsive.
- NOTE Confidence: 0.9055412325
- $00:15:20.780 \longrightarrow 00:15:22.880$  OK, so this is our simulation.
- NOTE Confidence: 0.9055412325
- $00:15:22.880 \longrightarrow 00:15:23.880$  Now we wanted to say,
- NOTE Confidence: 0.9055412325
- $00{:}15{:}23.880 \dashrightarrow 00{:}15{:}26.022$  what can we learn by applying this
- NOTE Confidence: 0.9055412325
- $00:15:26.022 \rightarrow 00:15:27.939$  sort of method to actual data?
- NOTE Confidence: 0.9055412325
- $00{:}15{:}27{.}940 \dashrightarrow 00{:}15{:}29{.}326$  And so we went back to this
- NOTE Confidence: 0.9055412325
- $00{:}15{:}29{.}326 \dashrightarrow 00{:}15{:}30{.}123$  social learning experiment that
- NOTE Confidence: 0.9055412325

00:15:30.123 --> 00:15:31.344 I told you about and said, OK,

NOTE Confidence: 0.9055412325

 $00{:}15{:}31{.}344 \dashrightarrow 00{:}15{:}33{.}540$  if we take the neurons from the ACC and

NOTE Confidence: 0.9055412325

 $00:15:33.599 \rightarrow 00:15:35.699$  the BLA and we cluster them together,

NOTE Confidence: 0.9055412325

 $00:15:35.700 \rightarrow 00:15:37.440$  are neurons distributed across

NOTE Confidence: 0.9055412325

 $00:15:37.440 \longrightarrow 00:15:39.615$  ensembles or do they segregate?

NOTE Confidence: 0.9055412325

 $00:15:39.620 \longrightarrow 00:15:41.162$  In other words,

NOTE Confidence: 0.9055412325

 $00{:}15{:}41{.}162 \dashrightarrow 00{:}15{:}43{.}732$  do neurons across different regions

NOTE Confidence: 0.9055412325

 $00:15:43.732 \rightarrow 00:15:46.340$  actually share firing rate properties?

NOTE Confidence: 0.931738313076923

 $00:15:48.800 \longrightarrow 00:15:50.284$  And so when we look at the

NOTE Confidence: 0.931738313076923

 $00:15:50.284 \rightarrow 00:15:51.599$  neurons in the ACC and BLA,

NOTE Confidence: 0.931738313076923

 $00{:}15{:}51{.}600 \dashrightarrow 00{:}15{:}53{.}770$  indeed what we find is a distributed

NOTE Confidence: 0.931738313076923

 $00:15:53.770 \rightarrow 00:15:55.958$  representation where you have these various

NOTE Confidence: 0.931738313076923

 $00{:}15{:}55{.}958 \dashrightarrow 00{:}15{:}57{.}558$  ensembles with different properties,

NOTE Confidence: 0.931738313076923

00:15:57.560 -> 00:15:59.102 but you have neurons from both

NOTE Confidence: 0.931738313076923

 $00:15:59.102 \dashrightarrow 00:16:01.080$  the ACC and the BLA within them.

NOTE Confidence: 0.931738313076923

 $00:16:01.080 \rightarrow 00:16:02.920$  Now this makes sense intuitively,

- NOTE Confidence: 0.931738313076923
- $00:16:02.920 \longrightarrow 00:16:05.076$  although no one had shown this before.
- NOTE Confidence: 0.931738313076923
- $00:16:05.080 \rightarrow 00:16:06.835$  If we think about the fact that these new,
- NOTE Confidence: 0.931738313076923
- $00:16:06.840 \rightarrow 00:16:08.392$  these regions have reciprocal.
- NOTE Confidence: 0.931738313076923
- $00:16:08.392 \rightarrow 00:16:10.332$  Anatomical connections with each other,
- NOTE Confidence: 0.931738313076923
- $00:16:10.340 \rightarrow 00:16:11.618$  and they're both involved in learning.
- NOTE Confidence: 0.931738313076923
- $00:16:11.620 \longrightarrow 00:16:13.240$  One might hypothesize that
- NOTE Confidence: 0.931738313076923
- $00:16:13.240 \longrightarrow 00:16:14.860$  they would share ensembles,
- NOTE Confidence: 0.931738313076923
- $00:16:14.860 \longrightarrow 00:16:16.150$  but we were able to actually
- NOTE Confidence: 0.931738313076923
- $00{:}16{:}16{.}150 \dashrightarrow 00{:}16{:}17{.}619$  demonstrate that that is the case here.
- NOTE Confidence: 0.931738313076923
- 00:16:17.620 --> 00:16:18.614 Interestingly, though,
- NOTE Confidence: 0.931738313076923
- $00:16:18.614 \longrightarrow 00:16:21.944$  there's a different sort of distribution of
- NOTE Confidence: 0.931738313076923
- $00:16:21.944 \rightarrow 00:16:24.054$  that representation between the regions,
- NOTE Confidence: 0.931738313076923
- $00{:}16{:}24.060 \dashrightarrow 00{:}16{:}26.620$  and so you can still see that there's
- NOTE Confidence: 0.931738313076923
- $00{:}16{:}26.620 \dashrightarrow 00{:}16{:}28.806$  some separation in sort of the Fe
- NOTE Confidence: 0.931738313076923
- $00{:}16{:}28.806 \dashrightarrow 00{:}16{:}30.286$  code between these two regions.
- NOTE Confidence: 0.931738313076923

 $00:16:30.290 \longrightarrow 00:16:32.324$  So we wanted to go back into this idea

NOTE Confidence: 0.931738313076923

 $00:16:32.324 \rightarrow 00:16:34.492$  of that there's certain neurons in the

NOTE Confidence: 0.931738313076923

 $00:16:34.492 \rightarrow 00:16:36.434$  ACC that are actually tracking learning,

NOTE Confidence: 0.931738313076923

 $00:16:36.434 \rightarrow 00:16:38.084$  and I showed you sort of

NOTE Confidence: 0.931738313076923

 $00:16:38.084 \longrightarrow 00:16:40.369$  individual neuron example of that.

NOTE Confidence: 0.931738313076923

 $00:16:40.370 \rightarrow 00:16:43.072$  We hypothesize that if this is actually

NOTE Confidence: 0.931738313076923

00:16:43.072 --> 00:16:45.143 picking up real ensemble dynamics,

NOTE Confidence: 0.931738313076923

 $00:16:45.143 \rightarrow 00:16:48.160$  it should be able to find some.

NOTE Confidence: 0.931738313076923

00:16:48.160 --> 00:16:48.694 Excuse me,

NOTE Confidence: 0.931738313076923

 $00:16:48.694 \longrightarrow 00:16:50.563$  It should be able to find some

NOTE Confidence: 0.931738313076923

 $00{:}16{:}50{.}563 \dashrightarrow 00{:}16{:}52{.}291$  differences in learning that occur

NOTE Confidence: 0.931738313076923

 $00{:}16{:}52{.}291 \dashrightarrow 00{:}16{:}53{.}586$  between habituation and conditioning.

NOTE Confidence: 0.931738313076923

 $00:16:53.586 \rightarrow 00:16:54.758$  And as a control,

NOTE Confidence: 0.931738313076923

 $00:16:54.760 \longrightarrow 00:16:56.840$  we basically take all of the same data,

NOTE Confidence: 0.931738313076923

 $00:16:56.840 \rightarrow 00:16:58.640$  we divide the sessions the same,

NOTE Confidence: 0.931738313076923

 $00:16:58.640 \rightarrow 00:17:01.160$  but we give a false cue to the algorithm.

 $00:17:01.160 \longrightarrow 00:17:02.306$  So a cue that actually wasn't

NOTE Confidence: 0.931738313076923

 $00:17:02.306 \longrightarrow 00:17:02.879$  there and asked,

NOTE Confidence: 0.931738313076923

 $00:17:02.880 \rightarrow 00:17:04.712$  is it going to still say that something

NOTE Confidence: 0.931738313076923

 $00:17:04.712 \longrightarrow 00:17:06.080$  happened or not as our control?

NOTE Confidence: 0.931738313076923

00:17:06.080 --> 00:17:08.520 And So what I'm showing you on the left here,

NOTE Confidence: 0.931738313076923

 $00:17:08.520 \longrightarrow 00:17:10.732$  Gray is the ensemble

NOTE Confidence: 0.931738313076923

 $00:17:10.732 \rightarrow 00:17:12.240$  representation doing habituation,

NOTE Confidence: 0.931738313076923

 $00:17:12.240 \rightarrow 00:17:14.240$  and in red is conditioning,

NOTE Confidence: 0.931738313076923

 $00{:}17{:}14.240 \dashrightarrow 00{:}17{:}15.976$  and you can see that there's a shift.

NOTE Confidence: 0.931738313076923

 $00:17:15.980 \longrightarrow 00:17:18.241$  From this low phasicity space into a

NOTE Confidence: 0.931738313076923

 $00:17:18.241 \rightarrow 00:17:20.294$  high phasicity space that occurs during

NOTE Confidence: 0.931738313076923

 $00:17:20.294 \longrightarrow 00:17:22.334$  learning this idea that neurons are

NOTE Confidence: 0.931738313076923

 $00{:}17{:}22{.}340 \dashrightarrow 00{:}17{:}24{.}422$  kind of tightening their response to

NOTE Confidence: 0.931738313076923

 $00{:}17{:}24.422 \dashrightarrow 00{:}17{:}27.060$  to the queue and you don't see that

NOTE Confidence: 0.931738313076923

 $00{:}17{:}27.060 \dashrightarrow 00{:}17{:}29.496$  when you look at the control condition.
$00:17:29.500 \rightarrow 00:17:31.100$  And so if you just break this down

NOTE Confidence: 0.931738313076923

 $00{:}17{:}31{.}100 \dashrightarrow 00{:}17{:}32{.}780$  into a uni dimensional analysis,

NOTE Confidence: 0.931738313076923

 $00{:}17{:}32.780 \dashrightarrow 00{:}17{:}35.220$  you can see that there is a significant

NOTE Confidence: 0.931738313076923

 $00:17:35.220 \rightarrow 00:17:36.883$  difference in the phasicity parameter

NOTE Confidence: 0.931738313076923

 $00{:}17{:}36.883 \dashrightarrow 00{:}17{:}39.609$  for learning when you look at the actual

NOTE Confidence: 0.931738313076923

 $00{:}17{:}39{.}609 \dashrightarrow 00{:}17{:}41{.}220$  queue versus the the control condition.

NOTE Confidence: 0.931738313076923

 $00{:}17{:}41.220 \dashrightarrow 00{:}17{:}43.094$  And so we we can use this to

NOTE Confidence: 0.931738313076923

 $00:17:43.094 \rightarrow 00:17:44.588$  start looking at the kinds of

NOTE Confidence: 0.931738313076923

 $00{:}17{:}44.588$  -->  $00{:}17{:}45.980$  parameters that an ensemble might.

NOTE Confidence: 0.931738313076923

 $00:17:45.980 \dashrightarrow 00:17:48.580$  Be using to represent learning

NOTE Confidence: 0.931738313076923

 $00:17:48.580 \longrightarrow 00:17:50.730$  as as animals are actually

NOTE Confidence: 0.931738313076923

 $00{:}17{:}50{.}730 \dashrightarrow 00{:}17{:}52{.}020$  behaviorally demonstrating it.

NOTE Confidence: 0.931738313076923

 $00{:}17{:}52.020 \dashrightarrow 00{:}17{:}53.812$  What's powerful is this is that we

NOTE Confidence: 0.931738313076923

 $00{:}17{:}53.812 \dashrightarrow 00{:}17{:}55.597$  can then take these parameters and

NOTE Confidence: 0.931738313076923

 $00:17:55.597 \rightarrow 00:17:57.517$  begin to form hypothesis about the

NOTE Confidence: 0.931738313076923

 $00:17:57.517 \longrightarrow 00:17:59.575$  kind of biological or bi physical

 $00:17:59.575 \rightarrow 00:18:01.255$  properties that might be necessary

NOTE Confidence: 0.931738313076923

 $00:18:01.260 \longrightarrow 00:18:02.820$  to undergo this kind of change.

NOTE Confidence: 0.931738313076923

 $00:18:02.820 \rightarrow 00:18:04.956$  And so we wanted to actually go into

NOTE Confidence: 0.931738313076923

 $00:18:04.956 \longrightarrow 00:18:07.334$  the data and see if that might be true.

NOTE Confidence: 0.931738313076923

 $00:18:07.340 \longrightarrow 00:18:09.460$  And so to look at that we're going

NOTE Confidence: 0.931738313076923

 $00{:}18{:}09{.}460 \dashrightarrow 00{:}18{:}11{.}436$  to use a molecular biology approach

NOTE Confidence: 0.931738313076923

 $00:18:11.436 \dashrightarrow 00:18:14.150$  here which is a a Krylox V system.

NOTE Confidence: 0.931738313076923

 $00:18:14.150 \longrightarrow 00:18:17.360$  To be able to express channel

NOTE Confidence: 0.931738313076923

 $00{:}18{:}17{.}360 \dashrightarrow 00{:}18{:}19{.}303$  adoption within a specific circuit.

NOTE Confidence: 0.931738313076923

 $00{:}18{:}19{.}303 \dashrightarrow 00{:}18{:}21{.}049$  And here we're looking at the

NOTE Confidence: 0.931738313076923

 $00:18:21.049 \longrightarrow 00:18:23.514$  anterior singlet neurons that project

NOTE Confidence: 0.931738313076923

 $00{:}18{:}23.514 \dashrightarrow 00{:}18{:}25.866$  monosynaptically to the amygdala.

NOTE Confidence: 0.931738313076923

 $00{:}18{:}25{.}870 \dashrightarrow 00{:}18{:}27{.}790$  And so we can express channel adoption here.

NOTE Confidence: 0.93824092

 $00{:}18{:}27.790 \dashrightarrow 00{:}18{:}28.710$  And when we shine light,

NOTE Confidence: 0.93824092

 $00{:}18{:}28{.}710 \dashrightarrow 00{:}18{:}30{.}186$  we see different populations.

 $00:18:30.186 \longrightarrow 00:18:32.400$  Neurons that are in this monosynaptic

NOTE Confidence: 0.93824092

 $00:18:32.461 \longrightarrow 00:18:33.833$  projection show very shortly

NOTE Confidence: 0.93824092

 $00:18:33.833 \rightarrow 00:18:35.548$  and see responses to light,

NOTE Confidence: 0.93824092

 $00:18:35.550 \longrightarrow 00:18:36.880$  whereas neurons that are in

NOTE Confidence: 0.93824092

 $00{:}18{:}36{.}880 \dashrightarrow 00{:}18{:}38{.}650$  this excited network and so they

NOTE Confidence: 0.93824092

 $00:18:38.650 \rightarrow 00:18:40.198$  receive either reciprocal feedback.

NOTE Confidence: 0.93824092

00:18:40.200 --> 00:18:43.080 Or collaterals from these excitatory neurons,

NOTE Confidence: 0.93824092

 $00:18:43.080 \rightarrow 00:18:44.485$  they show light responses that

NOTE Confidence: 0.93824092

00:18:44.485 --> 00:18:46.360 are a little bit longer latency,

NOTE Confidence: 0.93824092

 $00{:}18{:}46{.}360 \dashrightarrow 00{:}18{:}48{.}418$  and then these inhibited network neurons are

NOTE Confidence: 0.93824092

 $00{:}18{:}48{.}418 \dashrightarrow 00{:}18{:}50{.}559$  within the network but not directly involved,

NOTE Confidence: 0.93824092

 $00:18:50.560 \longrightarrow 00:18:51.480$  and they show inhibited

NOTE Confidence: 0.93824092

 $00:18:51.480 \longrightarrow 00:18:52.400$  responses to the light.

NOTE Confidence: 0.93824092

00:18:52.400 --> 00:18:54.440 OK, so we're able to record from neurons,

NOTE Confidence: 0.93824092

 $00:18:54.440 \rightarrow 00:18:56.036$  identify where they are in the circuit,

NOTE Confidence: 0.93824092

 $00:18:56.040 \rightarrow 00:18:57.272$  and the question is,

 $00:18:57.272 \longrightarrow 00:18:59.590$  will we see a difference in our

NOTE Confidence: 0.93824092

 $00{:}18{:}59{.}590 \dashrightarrow 00{:}19{:}01{.}580$  ensemble representation when we are

NOTE Confidence: 0.93824092

 $00:19:01.580 \rightarrow 00:19:03.707$  informing it about the anatomical

NOTE Confidence: 0.93824092

 $00{:}19{:}03.707 \dashrightarrow 00{:}19{:}07.020$  properties of the neurons involved?

NOTE Confidence: 0.93824092

 $00:19:07.020 \longrightarrow 00:19:08.455$  And so sort of give you the

NOTE Confidence: 0.93824092

00:19:08.455 --> 00:19:09.698 graphical sense of what this is.

NOTE Confidence: 0.93824092

 $00:19:09.700 \rightarrow 00:19:11.086$  This is the same population that

NOTE Confidence: 0.93824092

 $00:19:11.086 \rightarrow 00:19:12.606$  we were looking at before where

NOTE Confidence: 0.93824092

 $00{:}19{:}12.606 \dashrightarrow 00{:}19{:}13.966$  there's this low phasicity space

NOTE Confidence: 0.93824092

 $00:19:13.966 \rightarrow 00:19:15.740$  that goes away during conditioning.

NOTE Confidence: 0.93824092

00:19:15.740 --> 00:19:17.340 But now we're also looking

NOTE Confidence: 0.93824092

 $00{:}19{:}17{.}340 \dashrightarrow 00{:}19{:}18{.}620$  at the individual neurons,

NOTE Confidence: 0.93824092

 $00:19:18.620 \rightarrow 00:19:20.060$  What network are they in?

NOTE Confidence: 0.93824092

 $00{:}19{:}20.060 \dashrightarrow 00{:}19{:}22.230$  And So what is the distance that

NOTE Confidence: 0.93824092

 $00:19:22.230 \rightarrow 00:19:24.618$  they travel as neurons are learning.

 $00:19:24.620 \rightarrow 00:19:26.156$  This is another way of looking at it

NOTE Confidence: 0.93824092

 $00:19:26.156 \longrightarrow 00:19:27.870$  to just illustrate the point that when

NOTE Confidence: 0.93824092

 $00{:}19{:}27.870 \dashrightarrow 00{:}19{:}29.859$  we know the network identity of the neurons,

NOTE Confidence: 0.93824092

 $00{:}19{:}29.860 \dashrightarrow 00{:}19{:}32.530$  we're able to pick out significant

NOTE Confidence: 0.93824092

 $00{:}19{:}32{.}530 \dashrightarrow 00{:}19{:}34{.}757$  differences in the parameters by

NOTE Confidence: 0.93824092

 $00{:}19{:}34.757 \dashrightarrow 00{:}19{:}36.752$  which they're encoding learning.

NOTE Confidence: 0.93824092

 $00{:}19{:}36.752 \dashrightarrow 00{:}19{:}39.954$  And here we provide evidence at the

NOTE Confidence: 0.93824092

 $00:19:39.954 \rightarrow 00:19:41.609$  ensemble level to the hypothesis

NOTE Confidence: 0.93824092

00:19:41.609 --> 00:19:43.891 that people have had that I actually

NOTE Confidence: 0.93824092

00:19:43.891 --> 00:19:45.534 gabourgic signaling in the cortex

NOTE Confidence: 0.93824092

00:19:45.534 --> 00:19:47.490 and how that is shifting parameter

NOTE Confidence: 0.93824092

 $00{:}19{:}47{.}490 \dashrightarrow 00{:}19{:}49{.}242$  responses that are enabling animals

NOTE Confidence: 0.93824092

 $00{:}19{:}49{.}242 \dashrightarrow 00{:}19{:}51{.}822$  to learn during this sort of process.

NOTE Confidence: 0.93824092

 $00{:}19{:}51.822 \dashrightarrow 00{:}19{:}53.542$  This ensemble data provides evidence

NOTE Confidence: 0.93824092

 $00:19:53.542 \longrightarrow 00:19:54.230$  for that,

NOTE Confidence: 0.93824092

 $00:19:54.230 \longrightarrow 00:19:55.698$  that sort of hypothesis.

 $00:19:55.698 \rightarrow 00:19:58.421$  Could we see the greatest changes in

NOTE Confidence: 0.93824092

 $00{:}19{:}58{.}421 \dashrightarrow 00{:}20{:}00{.}671$  phasicity actually happening within the

NOTE Confidence: 0.93824092

 $00:20:00.671 \longrightarrow 00:20:02.980$  inhibited network versus the others?

NOTE Confidence: 0.93824092

 $00{:}20{:}02{.}980 \dashrightarrow 00{:}20{:}05{.}640$  And so a major motivation for developing

NOTE Confidence: 0.93824092

 $00{:}20{:}05{.}640 \dashrightarrow 00{:}20{:}08{.}236$  this sort of approach was that it

NOTE Confidence: 0.93824092

 $00{:}20{:}08.236 \dashrightarrow 00{:}20{:}11.241$  might be a very useful way to begin

NOTE Confidence: 0.93824092

 $00:20:11.241 \longrightarrow 00:20:13.093$  looking at the translational problem.

NOTE Confidence: 0.93824092

 $00:20:13.093 \rightarrow 00:20:14.948$  And that problem is that,

NOTE Confidence: 0.93824092

00:20:14.950 --> 00:20:15.598 you know,

NOTE Confidence: 0.93824092

 $00{:}20{:}15.598 \dashrightarrow 00{:}20{:}17.866$  we are able to look at behavioral

NOTE Confidence: 0.93824092

00:20:17.870 --> 00:20:19.310 systems across mics,

NOTE Confidence: 0.93824092

 $00{:}20{:}19{.}310 \dashrightarrow 00{:}20{:}20{.}750$  humans and primates,

NOTE Confidence: 0.93824092

 $00{:}20{:}20{.}750 \dashrightarrow 00{:}20{:}21{.}900$  but there's really differences in

NOTE Confidence: 0.93824092

 $00{:}20{:}21{.}900 \dashrightarrow 00{:}20{:}23{.}604$  the ways in which they can behave

NOTE Confidence: 0.93824092

 $00{:}20{:}23.604 \dashrightarrow 00{:}20{:}24.869$  and we're looking and searching.

 $00{:}20{:}24.870 \dashrightarrow 00{:}20{:}26.568$  I'm collaborating with Steve China to

NOTE Confidence: 0.93824092

 $00{:}20{:}26{.}568 \dashrightarrow 00{:}20{:}28{.}698$  really think about ways that one might

NOTE Confidence: 0.93824092

00:20:28.698 --> 00:20:29.958 develop social behavioral experiments

NOTE Confidence: 0.93824092

 $00:20:29.958 \rightarrow 00:20:32.390$  that can go across a model systems.

NOTE Confidence: 0.93824092

 $00:20:32.390 \longrightarrow 00:20:32.694$  However,

NOTE Confidence: 0.93824092

 $00:20:32.694 \longrightarrow 00:20:33.910$  for humans and primates,

NOTE Confidence: 0.93824092

 $00{:}20{:}33{.}910 \dashrightarrow 00{:}20{:}36{.}136$  we can actually design one to one

NOTE Confidence: 0.93824092

 $00{:}20{:}36{.}136 \dashrightarrow 00{:}20{:}37{.}392$  human behavioral paradigms and

NOTE Confidence: 0.93824092

 $00{:}20{:}37{.}392 \dashrightarrow 00{:}20{:}39{.}107$  I'll show you an example of that.

NOTE Confidence: 0.93824092

 $00:20:39.110 \longrightarrow 00:20:41.060$  We can get different kinds of

NOTE Confidence: 0.93824092

 $00{:}20{:}41.060 \dashrightarrow 00{:}20{:}42.360$  neurophysiology data across these

NOTE Confidence: 0.93824092

 $00{:}20{:}42{.}412 \dashrightarrow 00{:}20{:}44{.}540$  different model systems and that has led

NOTE Confidence: 0.93824092

 $00:20:44.540 \longrightarrow 00:20:46.587$  to different sorts of ways of analyzing.

NOTE Confidence: 0.93824092

 $00{:}20{:}46.590 \dashrightarrow 00{:}20{:}47.590$  And we're hoping that this

NOTE Confidence: 0.93824092

00:20:47.590 --> 00:20:48.590 sort of states based approach,

NOTE Confidence: 0.93824092

 $00:20:48.590 \longrightarrow 00:20:51.122$  because it allows you to take

 $00{:}20{:}51{.}122 \dashrightarrow 00{:}20{:}53{.}347$  neural observations and then derive

NOTE Confidence: 0.93824092

 $00{:}20{:}53.347 \dashrightarrow 00{:}20{:}55.572$  actual state formulations for how

NOTE Confidence: 0.93824092

00:20:55.572 --> 00:20:57.308 population activity is changing,

NOTE Confidence: 0.93824092

 $00{:}20{:}57{.}310 \dashrightarrow 00{:}20{:}59{.}123$  might provide a window to be able

NOTE Confidence: 0.93824092

 $00{:}20{:}59{.}123 \dashrightarrow 00{:}21{:}00{.}791$  to ask across different model

NOTE Confidence: 0.93824092

 $00:21:00.791 \longrightarrow 00:21:02.861$  systems and different kinds of

NOTE Confidence: 0.93824092

 $00:21:02.861 \longrightarrow 00:21:04.717$  neuronal representations how animals

NOTE Confidence: 0.93824092

 $00:21:04.717 \rightarrow 00:21:07.162$  representing social information and so.

NOTE Confidence: 0.93824092

00:21:07.162 --> 00:21:08.108 Towards this,

NOTE Confidence: 0.93824092

00:21:08.110 --> 00:21:09.094 I won't talk about the human

NOTE Confidence: 0.93824092

 $00:21:09.094 \rightarrow 00:21:09.750$  side of this today,

NOTE Confidence: 0.93824092

 $00{:}21{:}09{.}750 \dashrightarrow 00{:}21{:}12{.}070$  but I wanted to show you some of the work

NOTE Confidence: 0.93824092

 $00:21:12.130 \longrightarrow 00:21:13.354$  we're doing with primate

NOTE Confidence: 0.93824092

 $00:21:13.354 \longrightarrow 00:21:15.190$  data to apply this this tool.

NOTE Confidence: 0.93824092

00:21:15.190 --> 00:21:16.150 And so like I showed you,

 $00:21:16.150 \longrightarrow 00:21:17.890$  Steve Chang has developed this

NOTE Confidence: 0.93824092

 $00{:}21{:}17.890 \dashrightarrow 00{:}21{:}19.518$  model where primates can look at

NOTE Confidence: 0.93824092

 $00{:}21{:}19{.}518 \dashrightarrow 00{:}21{:}21{.}278$  each other or an object while he's

NOTE Confidence: 0.93824092

 $00{:}21{:}21{.}278 \dashrightarrow 00{:}21{:}22.838$  recording from these different brain

NOTE Confidence: 0.93824092

 $00{:}21{:}22.838 \dashrightarrow 00{:}21{:}24.920$  regions and importantly 2 of the same

NOTE Confidence: 0.93824092

 $00{:}21{:}24{.}920 \dashrightarrow 00{:}21{:}26{.}230$  regions that we're interested in,

NOTE Confidence: 0.93824092

 $00{:}21{:}26{.}230 \dashrightarrow 00{:}21{:}30{.}829$  the anti single cortex and the amygdala.

NOTE Confidence: 0.93824092

 $00:21:30.830 \rightarrow 00:21:32.573$  He published this paper in Neuron where

NOTE Confidence: 0.93824092

 $00{:}21{:}32{.}573 \dashrightarrow 00{:}21{:}34{.}127$  they're able to look at individual

NOTE Confidence: 0.93824092

 $00{:}21{:}34{.}127 \dashrightarrow 00{:}21{:}35{.}898$  neuro responses and show a variety of

NOTE Confidence: 0.93824092

 $00:21:35.951 \rightarrow 00:21:37.983$  ways in which neurons are responding to face.

NOTE Confidence: 0.93824092

00:21:37.990 --> 00:21:39.710 Eyes are object, but again,

NOTE Confidence: 0.93824092

 $00{:}21{:}39{.}710 \dashrightarrow 00{:}21{:}42{.}986$  they have to really start to define a neuron

NOTE Confidence: 0.93824092

 $00:21:42.986 \rightarrow 00:21:46.607$  as responding to face or object or eyes and.

NOTE Confidence: 0.93824092

 $00:21:46.610 \longrightarrow 00:21:48.227$  They're missing a lot of the nuances

NOTE Confidence: 0.93824092

 $00:21:48.227 \rightarrow 00:21:49.889$  that are happening at the ensemble level,

- NOTE Confidence: 0.93824092
- $00:21:49.890 \longrightarrow 00:21:51.170$  even though they're able to
- NOTE Confidence: 0.93824092
- $00{:}21{:}51{.}170 \dashrightarrow 00{:}21{:}52{.}825$  describe at the single unit level
- NOTE Confidence: 0.93824092
- $00:21:52.825 \rightarrow 00:21:54.129$  what's happening really well.
- NOTE Confidence: 0.93824092
- $00:21:54.130 \rightarrow 00:21:56.010$  And so we wanted to apply it to this data.
- NOTE Confidence: 0.93824092
- $00:21:56.010 \longrightarrow 00:21:57.624$  And here's an example from the
- NOTE Confidence: 0.93824092
- $00{:}21{:}57.624 \dashrightarrow 00{:}21{:}58.700$  anterior singlet cortex where
- NOTE Confidence: 0.93824092
- 00:21:58.745 00:22:00.089 we see some things that again,
- NOTE Confidence: 0.93824092
- $00:22:00.090 \longrightarrow 00:22:01.203$  intuitively make sense.
- NOTE Confidence: 0.93824092
- $00:22:01.203 \rightarrow 00:22:03.058$  There's some overlap between the
- NOTE Confidence: 0.93824092
- $00:22:03.058 \longrightarrow 00:22:05.010$  face and eyes representation,
- NOTE Confidence: 0.93824092
- $00:22:05.010 \rightarrow 00:22:06.810$  although there's some places where
- NOTE Confidence: 0.93824092
- $00{:}22{:}06{.}810 \dashrightarrow 00{:}22{:}08{.}250$  we have segregated ensembles,
- NOTE Confidence: 0.93824092
- $00:22:08.250 \longrightarrow 00:22:09.447$  And when we look at the object,
- NOTE Confidence: 0.93824092
- $00:22:09.450 \longrightarrow 00:22:11.770$  we see that it's really sort of spatially
- NOTE Confidence: 0.93824092
- $00:22:11.770 \longrightarrow 00:22:15.750$  distinct from the other representations.
- NOTE Confidence: 0.93824092

 $00{:}22{:}15.750 \dashrightarrow 00{:}22{:}17.455$  And again we can look at this at at NOTE Confidence: 0.93824092

 $00{:}22{:}17{.}455 \dashrightarrow 00{:}22{:}19{.}265$  the uni in the uni dimensional way NOTE Confidence: 0.93824092

 $00{:}22{:}19{.}265 \dashrightarrow 00{:}22{:}21{.}220$  and see that there's these trends to NOTE Confidence: 0.93824092

 $00{:}22{:}21{.}220 \dashrightarrow 00{:}22{:}22{.}978$  for these parameters to be different NOTE Confidence: 0.93824092

00:22:22.978 --> 00:22:24.789 when animals are looking at social

NOTE Confidence: 0.93824092

00:22:24.789 --> 00:22:26.547 stimuli versus on non social stimuli.

NOTE Confidence: 0.93824092

 $00{:}22{:}26.550 \dashrightarrow 00{:}22{:}29.084$  And we've now applied this to various NOTE Confidence: 0.93824092

NOTE Confidence: 0.95824092

 $00{:}22{:}29.084 \dashrightarrow 00{:}22{:}30.910$  regions including the dorsomedia,

NOTE Confidence: 0.93824092

 $00{:}22{:}30{.}910 \dashrightarrow 00{:}22{:}33{.}390$  prefrontal cortex and the OFC.

NOTE Confidence: 0.93824092

 $00{:}22{:}33{.}390 \dashrightarrow 00{:}22{:}34{.}825$  And again you begin to see that

NOTE Confidence: 0.93824092

 $00{:}22{:}34.825 \dashrightarrow 00{:}22{:}36.184$  there might be different strategies

NOTE Confidence: 0.93824092

 $00:22:36.184 \rightarrow 00:22:37.924$  where there's much more segregation NOTE Confidence: 0.93824092

00:22:37.924 --> 00:22:39.584 in the representation between the

NOTE Confidence: 0.93824092

 $00{:}22{:}39{.}584 \dashrightarrow 00{:}22{:}41{.}009$  ACC and the dorsomedio prefrontal

NOTE Confidence: 0.93824092

 $00{:}22{:}41.009 \dashrightarrow 00{:}22{:}42.572$  cortex where there might be more

NOTE Confidence: 0.93824092

 $00{:}22{:}42.572 \dashrightarrow 00{:}22{:}44.548$  overlap in the area like the amygdala

 $00:22:44.550 \longrightarrow 00:22:45.750$  or the orbital frontal cortex.

NOTE Confidence: 0.93824092

 $00{:}22{:}45.750 \dashrightarrow 00{:}22{:}48.742$  And so we can kind of derive hypothesis

NOTE Confidence: 0.93824092

 $00{:}22{:}48.742 \dashrightarrow 00{:}22{:}51.138$  about what this might mean and how

NOTE Confidence: 0.93824092

 $00{:}22{:}51{.}138 \dashrightarrow 00{:}22{:}53{.}040$  these sorts of parameters across model

NOTE Confidence: 0.93824092

 $00:22:53.099 \rightarrow 00:22:55.001$  systems are changing as animals are

NOTE Confidence: 0.93824092

 $00{:}22{:}55{.}001 \dashrightarrow 00{:}22{:}57{.}143$  engaged in these sort of social behaviors.

NOTE Confidence: 0.93824092

 $00{:}22{:}57{.}143 \dashrightarrow 00{:}22{:}59{.}334$  And so I've shown you some behavioral

NOTE Confidence: 0.93824092

 $00{:}22{:}59{.}334 \dashrightarrow 00{:}23{:}01{.}368$  data in rodents and some behavioral

NOTE Confidence: 0.93824092

00:23:01.368 --> 00:23:03.755 data in non human primates where we're

NOTE Confidence: 0.93824092

 $00{:}23{:}03.755 \dashrightarrow 00{:}23{:}05.946$  able to record from neurons as animals

NOTE Confidence: 0.93824092

 $00:23:05.946 \longrightarrow 00:23:07.956$  are engaged in social behavior and

NOTE Confidence: 0.93824092

 $00{:}23{:}07{.}956 \dashrightarrow 00{:}23{:}10{.}020$  have now derived a new analytical

NOTE Confidence: 0.93824092

 $00:23:10.090 \longrightarrow 00:23:12.547$  approach that lets us know from these

NOTE Confidence: 0.93824092

 $00{:}23{:}12{.}547 \dashrightarrow 00{:}23{:}15{.}138$  recordings what are the groups of ensembles.

NOTE Confidence: 0.93824092

 $00:23:15.140 \longrightarrow 00:23:17.006$  We can assign parameters to ensembles

 $00:23:17.006 \rightarrow 00:23:19.419$  and then use that to begin better

NOTE Confidence: 0.93824092

 $00{:}23{:}19{.}419 \dashrightarrow 00{:}23{:}21{.}259$  understanding how brains across model

NOTE Confidence: 0.93824092

 $00:23:21.259 \rightarrow 00:23:23.700$  systems are are representing information.

NOTE Confidence: 0.93824092

 $00{:}23{:}23{.}700 \dashrightarrow 00{:}23{:}25{.}650$  We think that this will be

NOTE Confidence: 0.93824092

 $00{:}23{:}25.650 \dashrightarrow 00{:}23{:}27.414$  important for for translation.

NOTE Confidence: 0.93824092

 $00{:}23{:}27{.}414 \dashrightarrow 00{:}23{:}28{.}848$  In the future.

NOTE Confidence: 0.93824092

 $00{:}23{:}28.850 \dashrightarrow 00{:}23{:}32.010$  So I want to thank all of my mentors

NOTE Confidence: 0.93824092

00:23:32.010 -> 00:23:32.930 here in the department.

NOTE Confidence: 0.93824092

 $00:23:32.930 \longrightarrow 00:23:34.880$  This again has been really an

NOTE Confidence: 0.93824092

 $00:23:34.880 \longrightarrow 00:23:35.986$  amazing place to train.

NOTE Confidence: 0.93824092

 $00:23:35.986 \longrightarrow 00:23:39.689$  I feel really grateful to be able to

NOTE Confidence: 0.93824092

 $00{:}23{:}39{.}690 \dashrightarrow 00{:}23{:}42{.}610$  to be here and to continue to think

NOTE Confidence: 0.93824092

 $00:23:42.610 \longrightarrow 00:23:44.850$  critically with everyone about how we

NOTE Confidence: 0.93824092

 $00:23:44.850 \rightarrow 00:23:47.490$  can progress and evolve our community.

NOTE Confidence: 0.93824092

00:23:47.490 --> 00:23:51.096 And then my collaborator Steve Chang Demba,

NOTE Confidence: 0.93824092

00:23:51.096 --> 00:23:53.274 my PhD advisor,

- NOTE Confidence: 0.93824092
- $00{:}23{:}53{.}274 \dashrightarrow 00{:}23{:}56{.}180$  K Tai and.
- NOTE Confidence: 0.93824092
- $00{:}23{:}56{.}180 \dashrightarrow 00{:}23{:}57{.}450$  Many people have been able
- NOTE Confidence: 0.93824092
- $00{:}23{:}57{.}450 \dashrightarrow 00{:}23{:}58{.}720$  to work with me while
- NOTE Confidence: 0.9164979875
- $00:23:58.776 \longrightarrow 00:24:00.258$  I was here and really enable
- NOTE Confidence: 0.928177632
- $00{:}24{:}00{.}500 \dashrightarrow 00{:}24{:}03{.}620$  a lot of this work. So thank you all
- NOTE Confidence: 0.928177632
- $00{:}24{:}03.620 \dashrightarrow 00{:}24{:}05.060$  for listening and I appreciate it.
- NOTE Confidence: 0.932333685
- $00{:}24{:}25.680 \dashrightarrow 00{:}24{:}27.936$  I was wondering since you see most of
- NOTE Confidence: 0.932333685
- $00{:}24{:}27{.}936 \dashrightarrow 00{:}24{:}30{.}107$  the changes at least in these brain
- NOTE Confidence: 0.932333685
- $00{:}24{:}30{.}107 \dashrightarrow 00{:}24{:}32{.}258$  areas and phasicity and you have that NOTE Confidence: 0.932333685
- $00:24:32.258 \rightarrow 00:24:34.088$  baseline change between the excited
- NOTE Confidence: 0.932333685
- $00:24:34.088 \rightarrow 00:24:36.616$  and the inhibited in terms of jump.
- NOTE Confidence: 0.932333685
- $00{:}24{:}36{.}620 \dashrightarrow 00{:}24{:}39{.}360$  What what would you predict
- NOTE Confidence: 0.932333685
- $00:24:39.360 \longrightarrow 00:24:40.700$  across other brain regions?
- NOTE Confidence: 0.932333685
- $00{:}24{:}40.700 \dashrightarrow 00{:}24{:}42.120$  Is phasicity the thing that
- NOTE Confidence: 0.932333685
- $00:24:42.120 \rightarrow 00:24:43.540$  would change most with learning?
- NOTE Confidence: 0.932333685

 $00:24:43.540 \longrightarrow 00:24:44.780$  Is jump more stable?

NOTE Confidence: 0.932333685

 $00:24:44.780 \longrightarrow 00:24:47.020$  What would it take to change jump?

NOTE Confidence: 0.94931066

 $00{:}24{:}48{.}260 \dashrightarrow 00{:}24{:}50{.}708$  Those are exactly the kinds of

NOTE Confidence: 0.94931066

 $00:24:50.708 \rightarrow 00:24:52.340$  questions that we're asking.

NOTE Confidence: 0.94931066

 $00:24:52.340 \longrightarrow 00:24:54.470$  Phasicity seems like it might be

NOTE Confidence: 0.94931066

 $00:24:54.470 \longrightarrow 00:24:55.890$  a really interesting parameter

NOTE Confidence: 0.94931066

 $00:24:55.947 \longrightarrow 00:24:57.297$  when we think about how.

NOTE Confidence: 0.94931066

00:24:57.300 --> 00:24:59.210 Neurons might use things like

NOTE Confidence: 0.94931066

 $00{:}24{:}59{.}210$  -->  $00{:}25{:}00{.}738$  oscillations to communicate information.

NOTE Confidence: 0.94931066

 $00:25:00.740 \longrightarrow 00:25:02.580$  And so in shifting phasicity,

NOTE Confidence: 0.94931066

 $00:25:02.580 \rightarrow 00:25:04.165$  you might better enable neurons

NOTE Confidence: 0.94931066

 $00{:}25{:}04.165 \dashrightarrow 00{:}25{:}06.334$  within a certain ensemble to be able

NOTE Confidence: 0.94931066

 $00:25:06.334 \rightarrow 00:25:07.918$  to oscillate at a certain frequency

NOTE Confidence: 0.94931066

 $00{:}25{:}07{.}918$  -->  $00{:}25{:}10{.}978$  or get inputs at a certain timing.

NOTE Confidence: 0.94931066

 $00:25:10.980 \rightarrow 00:25:14.130$  Whereas jump might be more defined by

NOTE Confidence: 0.94931066

 $00:25:14.130 \rightarrow 00:25:17.380$  sort of what kinds of ion channels you have,

 $00:25:17.380 \longrightarrow 00:25:18.780$  how you know great of

NOTE Confidence: 0.936899133333333

 $00:25:19.380 \longrightarrow 00:25:20.736$  and how many spikes can you

NOTE Confidence: 0.937728247222222

 $00:25:21.180 \longrightarrow 00:25:22.923$  generate. And so some of what we're

NOTE Confidence: 0.937728247222222

 $00:25:22.923 \rightarrow 00:25:25.100$  going to do actually is to use

NOTE Confidence: 0.937728247222222

 $00:25:25.100 \rightarrow 00:25:26.476$  optogenetics to actually entrain.

NOTE Confidence: 0.937728247222222

 $00{:}25{:}26{.}480 \dashrightarrow 00{:}25{:}27{.}520$  Different circuits at specific

NOTE Confidence: 0.937728247222222

 $00:25:27.520 \rightarrow 00:25:29.666$  frequencies and ask how does that change

NOTE Confidence: 0.937728247222222

 $00:25:29.666 \rightarrow 00:25:31.746$  and shift the phasicity parameter?

NOTE Confidence: 0.937728247222222

 $00:25:31.746 \rightarrow 00:25:33.558$  If we over expressed time adoption,

NOTE Confidence: 0.937728247222222

 $00:25:33.560 \longrightarrow 00:25:35.478$  how does that shift the jump parameter

NOTE Confidence: 0.937728247222222

 $00:25:35.478 \rightarrow 00:25:37.528$  to really start getting at this question

NOTE Confidence: 0.937728247222222

 $00:25:37.528 \rightarrow 00:25:39.346$  of how are these parameters directly

NOTE Confidence: 0.937728247222222

 $00:25:39.346 \rightarrow 00:25:41.200$  related to biophysical properties

NOTE Confidence: 0.844705651666667

 $00{:}25{:}41{.}200 \dashrightarrow 00{:}25{:}42{.}556$  of the ensembles, which I think

NOTE Confidence: 0.943128802857143

 $00{:}25{:}42.560 \dashrightarrow 00{:}25{:}44.317$  is probably one of the most exciting

 $00:25:44.320 \rightarrow 00:25:45.400$  ways this could be helpful.

NOTE Confidence: 0.9201268

 $00{:}25{:}51{.}840 \dashrightarrow 00{:}25{:}53{.}520$  I was really struck in the earlier

NOTE Confidence: 0.94226628

 $00{:}25{:}53{.}520 \dashrightarrow 00{:}25{:}56{.}304$  slide by the effect where it seemed

NOTE Confidence: 0.94226628

 $00{:}25{:}56{.}304 \dashrightarrow 00{:}25{:}58{.}248$  that the intrasingulate response

NOTE Confidence: 0.94226628

 $00{:}25{:}58{.}248 \dashrightarrow 00{:}26{:}00{.}870$  to the observed cue was much more

NOTE Confidence: 0.94226628

 $00{:}26{:}00{.}870 \dashrightarrow 00{:}26{:}02{.}705$  sustained as compared with the BLA

NOTE Confidence: 0.94226628

 $00{:}26{:}02.705 \dashrightarrow 00{:}26{:}04.796$  and I think the similar thing has

NOTE Confidence: 0.94226628

 $00{:}26{:}04.796 \dashrightarrow 00{:}26{:}06.516$  been observed in predator threat.

NOTE Confidence: 0.94226628

00:26:06.520 --> 00:26:08.560 So I I just was curious your

NOTE Confidence: 0.941511525

 $00{:}26{:}08{.}560 \dashrightarrow 00{:}26{:}10{.}800$  speculation as to why there is a sustained

NOTE Confidence: 0.96289625

 $00:26:10.800 \rightarrow 00:26:12.280$  response in prefrontal cortical

NOTE Confidence: 0.96289625

00:26:12.280 --> 00:26:13.760 circuits to these aversive

NOTE Confidence: 0.96289625

 $00:26:13.760 \longrightarrow 00:26:15.160$  or socially aversive stimuli?

NOTE Confidence: 0.942668816

 $00{:}26{:}17.330 \dashrightarrow 00{:}26{:}18.704$  Actually this question is part of

NOTE Confidence: 0.942668816

 $00:26:18.704 \longrightarrow 00:26:20.030$  what got me interested in this

NOTE Confidence: 0.942668816

 $00:26:20.030 \longrightarrow 00:26:21.134$  work like looking at in vivo

- NOTE Confidence: 0.942668816
- $00:26:21.134 \rightarrow 00:26:22.460$  data and seeing that there's some
- NOTE Confidence: 0.942668816
- $00:26:22.460 \longrightarrow 00:26:24.410$  new other seem very sustained,
- NOTE Confidence: 0.942668816
- $00:26:24.410 \longrightarrow 00:26:26.090$  some that seem very basic.
- NOTE Confidence: 0.942668816
- $00:26:26.090 \rightarrow 00:26:28.238$  It's like what is the different
- NOTE Confidence: 0.942668816
- $00:26:28.238 \longrightarrow 00:26:29.670$  strategy for representation that
- NOTE Confidence: 0.942668816
- $00{:}26{:}29{.}734 \dashrightarrow 00{:}26{:}31{.}750$  And so one idea I think is that the
- NOTE Confidence: 0.942668816
- $00:26:31.750 \rightarrow 00:26:33.689$  more sustained firing is how the
- NOTE Confidence: 0.942668816
- $00:26:33.690 \rightarrow 00:26:35.830$  brain might represent state shifts.
- NOTE Confidence: 0.942668816
- 00:26:35.830 --> 00:26:38.256 So now I'm in an aversive state or
- NOTE Confidence: 0.942668816
- $00{:}26{:}38{.}256 \dashrightarrow 00{:}26{:}40{.}446$  now I need to attend to the state
- NOTE Confidence: 0.942668816
- $00{:}26{:}40{.}450 \dashrightarrow 00{:}26{:}42{.}202$  of this other animal that might
- NOTE Confidence: 0.942668816
- $00{:}26{:}42.202 \dashrightarrow 00{:}26{:}43.782$  be better represented by something
- NOTE Confidence: 0.942668816
- $00{:}26{:}43.782 \dashrightarrow 00{:}26{:}45.700$  that has like a very sustained.
- NOTE Confidence: 0.942668816
- 00:26:45.700 --> 00:26:49.180 Property, while a stimuli that comes NOTE Confidence: 0.937157104615385
- $00:26:49.180 \longrightarrow 00:26:50.750$  on or off or that comes in and out of NOTE Confidence: 0.937157104615385

 $00:26:50.801 \rightarrow 00:26:52.188$  attention might better be represented

NOTE Confidence: 0.937157104615385

 $00{:}26{:}52.188 \dashrightarrow 00{:}26{:}55.260$  by sort of more phasic property

NOTE Confidence: 0.951323285

 $00{:}26{:}55{.}260 \dashrightarrow 00{:}26{:}56{.}700$  and that's something that we can

NOTE Confidence: 0.951323285

 $00{:}26{:}56{.}700 \dashrightarrow 00{:}26{:}57{.}820$  like actually directly test. Thank

NOTE Confidence: 0.93019015

 $00:27:03.900 \rightarrow 00:27:04.100$  you.

NOTE Confidence: 0.917718008

 $00{:}27{:}06{.}300 \dashrightarrow 00{:}27{:}08{.}028$  Any other questions? No.

NOTE Confidence: 0.917718008

 $00:27:08.028 \longrightarrow 00:27:10.548$  OK, we will move on then.

NOTE Confidence: 0.917718008

 $00:27:10.548 \rightarrow 00:27:13.020$  Thank you a CA for a great presentation.

NOTE Confidence: 0.9335445666666667

 $00{:}27{:}18.880 \dashrightarrow 00{:}27{:}21.640$  So our next tree is there.

NOTE Confidence: 0.9335445666666667

00:27:21.640 --> 00:27:23.285 Jefferson is a wonderful rising

NOTE Confidence: 0.9335445666666667

 $00{:}27{:}23.285 \dashrightarrow 00{:}27{:}25.270$  third year resident Alex Pond is

NOTE Confidence: 0.9335445666666667

 $00{:}27{:}25{.}270 \dashrightarrow 00{:}27{:}28{.}559$  going to introduce her over Zoom.

NOTE Confidence: 0.9335445666666667

00:27:28.560 --> 00:27:31.800 So I think Alex, if you're able to,

NOTE Confidence: 0.9402535

 $00:27:37.640 \longrightarrow 00:27:39.560$  yeah. Are we ready? It works.

NOTE Confidence: 0.928752467142857

 $00:27:44.720 \longrightarrow 00:27:46.876$  Yeah, we can see. I hear you.

NOTE Confidence: 0.928752467142857

 $00:27:46.880 \rightarrow 00:27:48.700$  That's. I'm on my. I

- NOTE Confidence: 0.880673145
- $00:27:52.300 \longrightarrow 00:27:53.338$  just have to end this show.
- NOTE Confidence: 0.9330654
- $00:27:57.580 \longrightarrow 00:28:00.660$  We'll do it like this for now.
- NOTE Confidence: 0.9330654
- 00:28:00.660 --> 00:28:04.500 OK. You're good. Alex. Go ahead.
- NOTE Confidence: 0.9330654
- 00:28:04.500 --> 00:28:06.820 OK. Yeah. It is a pleasure
- NOTE Confidence: 0.962896185
- $00{:}28{:}06{.}820 \dashrightarrow 00{:}28{:}09{.}820$  to introduce Sarah Jefferson.
- NOTE Confidence: 0.962896185
- 00:28:09.820 --> 00:28:11.740 Sarah received her MD,
- NOTE Confidence: 0.962896185
- $00:28:11.740 \longrightarrow 00:28:13.660$  PhD from Penn State.
- NOTE Confidence: 0.962896185
- $00{:}28{:}13.660 \dashrightarrow 00{:}28{:}14.896$  She came to Yale.
- NOTE Confidence: 0.962896185
- $00{:}28{:}14.896 \dashrightarrow 00{:}28{:}16.441$  About three years ago to
- NOTE Confidence: 0.962896185
- 00:28:16.441 --> 00:28:18.370 start her residency with NRTP.
- NOTE Confidence: 0.946962475
- 00:28:19.250 --> 00:28:20.690 Yeah, I remember when we recruited
- NOTE Confidence: 0.945285244
- 00:28:20.690 --> 00:28:22.190 her, everyone was very thrilled
- NOTE Confidence: 0.945285244
- 00:28:22.190 --> 00:28:23.690 because of her PhD work,
- NOTE Confidence: 0.945285244
- $00:28:23.690 \longrightarrow 00:28:25.766$  which involved a series of very
- NOTE Confidence: 0.945285244
- 00:28:25.766 --> 00:28:27.976 elegant study on how GABA ergic
- NOTE Confidence: 0.945285244

 $00:28:27.976 \longrightarrow 00:28:30.250$  in the neurons is involved with

NOTE Confidence: 0.945285244

 $00{:}28{:}30{.}250 \dashrightarrow 00{:}28{:}32{.}609$  depression and antidepressant actions.

NOTE Confidence: 0.945285244

 $00:28:32.610 \longrightarrow 00:28:34.416$  And there's obviously a long history

NOTE Confidence: 0.945285244

 $00:28:34.416 \longrightarrow 00:28:36.089$  on this research topic at Yale,

NOTE Confidence: 0.945285244

 $00{:}28{:}36{.}090 \dashrightarrow 00{:}28{:}37{.}875$  starting from work with John

NOTE Confidence: 0.945285244

 $00{:}28{:}37.875 \dashrightarrow 00{:}28{:}40.030$  Crystal and Peter Muharram And then.

NOTE Confidence: 0.945285244

 $00{:}28{:}40{.}030 \dashrightarrow 00{:}28{:}41{.}934$  Later on on Ron Duman and then

NOTE Confidence: 0.945285244

 $00:28:41.934 \rightarrow 00:28:43.229$  more recently myself as well.

NOTE Confidence: 0.945285244

 $00{:}28{:}43{.}230 \dashrightarrow 00{:}28{:}45{.}400$  So it's very exciting to see that

NOTE Confidence: 0.945285244

 $00:28:45.400 \rightarrow 00:28:47.690$  Sarah can carry this torch and then

NOTE Confidence: 0.945285244

 $00{:}28{:}47.690 \dashrightarrow 00{:}28{:}49.628$  also move it to new directions.

NOTE Confidence: 0.945285244

 $00:28:49.630 \longrightarrow 00:28:51.222$  Sarah's current research focused

NOTE Confidence: 0.945285244

 $00:28:51.222 \longrightarrow 00:28:52.814$  on the potential the rapeutic

NOTE Confidence: 0.945285244

00:28:52.814 --> 00:28:54.390 effects of psychedelics.

NOTE Confidence: 0.945285244

 $00:28:54.390 \longrightarrow 00:28:56.750$  So today, as you see in the title,

NOTE Confidence: 0.945285244

 $00:28:56.750 \longrightarrow 00:28:59.434$  she'll talk about her work on one

- NOTE Confidence: 0.945285244
- $00{:}28{:}59{.}434 \dashrightarrow 00{:}29{:}02{.}248$  of the more classic but also lesser

00:29:02.248 --> 00:29:05.246 study compound called 5 Methoxy DMT.

NOTE Confidence: 0.945285244

 $00{:}29{:}05{.}250 \dashrightarrow 00{:}29{:}06{.}475$  And I think there's a lot of

NOTE Confidence: 0.945285244

00:29:06.475 - 00:29:07.441 opportunity with this area, right.

NOTE Confidence: 0.945285244

 $00{:}29{:}07{.}441 \dashrightarrow 00{:}29{:}09{.}289$  And Sarah will tell you more about it.

NOTE Confidence: 0.945285244

 $00{:}29{:}09{.}290 \dashrightarrow 00{:}29{:}11{.}265$  But this compound has several

NOTE Confidence: 0.945285244

 $00:29:11.265 \rightarrow 00:29:12.450$  very fascinating properties.

NOTE Confidence: 0.945285244

 $00:29:12.450 \longrightarrow 00:29:15.308$  Its effect is very short lasting in humans.

NOTE Confidence: 0.945285244

 $00{:}29{:}15{.}308 \dashrightarrow 00{:}29{:}17{.}191$  It only lasts for on the order

NOTE Confidence: 0.945285244

 $00:29:17.191 \longrightarrow 00:29:18.448$  of 10s of minutes.

NOTE Confidence: 0.945285244

 $00:29:18.450 \rightarrow 00:29:20.210$  And then the subjective experience

NOTE Confidence: 0.945285244

 $00{:}29{:}20{.}210 \dashrightarrow 00{:}29{:}21{.}970$  also very intense and nonvisual,

NOTE Confidence: 0.945285244

 $00:29:21.970 \longrightarrow 00:29:23.890$  very unlike other psychedelics

NOTE Confidence: 0.945285244

 $00{:}29{:}23.890 \dashrightarrow 00{:}29{:}25.810$  like psilocybin and LSC.

NOTE Confidence: 0.945285244

 $00{:}29{:}25{.}810 \dashrightarrow 00{:}29{:}28{.}242$  Currently there are a number of phase two

 $00:29:28.242 \rightarrow 00:29:30.127$  clinical trials to study this compound,

NOTE Confidence: 0.945285244

 $00{:}29{:}30{.}130 \dashrightarrow 00{:}29{:}32{.}146$  but there's really not a whole lot

NOTE Confidence: 0.945285244

00:29:32.146 --> 00:29:34.009 known about it in neurobiology.

NOTE Confidence: 0.945285244

 $00:29:34.010 \rightarrow 00:29:35.648$  So what Sarah will tell you,

NOTE Confidence: 0.945285244

 $00:29:35.650 \longrightarrow 00:29:37.512$  I believe is actually one of the

NOTE Confidence: 0.945285244

00:29:37.512 --> 00:29:38.983 first more rigorous published study

NOTE Confidence: 0.945285244

 $00:29:38.983 \rightarrow 00:29:40.518$  that actually looks very closely

NOTE Confidence: 0.945285244

 $00:29:40.518 \longrightarrow 00:29:42.646$  now at what this compound does in

NOTE Confidence: 0.945285244

 $00{:}29{:}42.646 \dashrightarrow 00{:}29{:}44.368$  terms of its neural and behavioral

NOTE Confidence: 0.945285244

 $00{:}29{:}44{.}370 \dashrightarrow 00{:}29{:}47{.}650$  effects in an animal model.

NOTE Confidence: 0.945285244

00:29:47.650 --> 00:29:49.450 So beyond, you know, just the work itself,

NOTE Confidence: 0.945285244

00:29:49.450 --> 00:29:51.818 I want to mention that, you know,

NOTE Confidence: 0.945285244

00:29:51.818 --> 00:29:53.238 Sarah started this project at

NOTE Confidence: 0.945285244

 $00:29:53.238 \longrightarrow 00:29:54.090$  a difficult time.

NOTE Confidence: 0.945285244

00:29:54.090 --> 00:29:54.504 I mean,

NOTE Confidence: 0.945285244

 $00:29:54.504 \rightarrow 00:29:56.448$  my lab was just about to move and she

- NOTE Confidence: 0.945285244
- $00:29:56.448 \longrightarrow 00:29:58.344$  had to complete all of the things we
- NOTE Confidence: 0.945285244
- $00:29:58.344 \rightarrow 00:30:00.248$  should tell you actually within a year.
- NOTE Confidence: 0.945285244
- $00:30:00.250 \longrightarrow 00:30:02.980$  So this really shows you.
- NOTE Confidence: 0.945285244
- $00:30:02.980 \longrightarrow 00:30:06.476$  How a sense in terms of his her
- NOTE Confidence: 0.945285244
- $00:30:06.476 \longrightarrow 00:30:08.260$  ability to just lean and execute.
- NOTE Confidence: 0.945285244
- $00{:}30{:}08{.}260 \dashrightarrow 00{:}30{:}10{.}436$  She had to learn new methods in terms
- NOTE Confidence: 0.945285244
- $00:30:10.436 \rightarrow 00:30:12.737$  of using two photon microscopy and then
- NOTE Confidence: 0.945285244
- $00:30:12.737 \longrightarrow 00:30:15.020$  also do all the experiment analysis.
- NOTE Confidence: 0.945285244
- $00:30:15.020 \dashrightarrow 00:30:17.008$  She's also extremely innovative
- NOTE Confidence: 0.945285244
- 00:30:17.008 --> 00:30:19.493 now working with Al K,
- NOTE Confidence: 0.945285244
- 00:30:19.500 --> 00:30:22.420 Chris Pinger and Marina Paciotto.
- NOTE Confidence: 0.945285244
- $00{:}30{:}22{.}420 \dashrightarrow 00{:}30{:}24{.}442$  She's now trying to combine these
- NOTE Confidence: 0.945285244
- $00:30:24.442 \rightarrow 00:30:26.250$  microscopy methods with molecular methods.
- NOTE Confidence: 0.945285244
- $00{:}30{:}26.250 \dashrightarrow 00{:}30{:}28.068$  To continue studying 5 MU DMT
- NOTE Confidence: 0.945285244
- $00:30:28.068 \dashrightarrow 00:30:30.210$  as well as other psyched elics.
- NOTE Confidence: 0.945285244

 $00:30:30.210 \longrightarrow 00:30:31.566$  So I really look forward to,

NOTE Confidence: 0.945285244

 $00:30:31.570 \longrightarrow 00:30:33.802$  you know, seeing what should achieve

NOTE Confidence: 0.945285244

 $00:30:33.802 \longrightarrow 00:30:35.290$  in the coming years.

NOTE Confidence: 0.945285244

 $00:30:35.290 \longrightarrow 00:30:36.220$  So with that,

NOTE Confidence: 0.945285244

00:30:36.220 --> 00:30:36.530 yeah,

NOTE Confidence: 0.945285244

 $00{:}30{:}36{.}530 \dashrightarrow 00{:}30{:}38{.}186$  Please join me to congratulate

NOTE Confidence: 0.945285244

 $00{:}30{:}38{.}186 \dashrightarrow 00{:}30{:}39{.}850$  and we lcome Sarah Jefferson.

NOTE Confidence: 0.945285244

00:30:39.850 --> 00:30:39.930 All

NOTE Confidence: 0.93824085

 $00{:}30{:}48{.}970 \dashrightarrow 00{:}30{:}50{.}543$  right. Thank you so much, Alex.

NOTE Confidence: 0.93824085

 $00:30:50.543 \rightarrow 00:30:58.320$  When I get this up, here we go. OK.

NOTE Confidence: 0.93824085

00:30:58.320 --> 00:30:59.648 So you know, first of all, just I,

NOTE Confidence: 0.93824085

 $00:30:59.648 \rightarrow 00:31:01.280$  I really want to thank the Lessman family,

NOTE Confidence: 0.93824085

00:31:01.280 --> 00:31:02.276 the Lessman Award Committee.

NOTE Confidence: 0.93824085

 $00{:}31{:}02{.}276$  -->  $00{:}31{:}04{.}654$  It's such an honor to be here and be able

NOTE Confidence: 0.93824085

 $00:31:04.654 \rightarrow 00:31:06.559$  to share this work with all of you today.

NOTE Confidence: 0.93824085

 $00:31:06.560 \longrightarrow 00:31:08.975$  And it's also an honor to follow

- NOTE Confidence: 0.93824085
- $00:31:08.975 \rightarrow 00:31:10.570$  such an incredible neuroscience

 $00:31:10.570 \dashrightarrow 00:31:13.500$  neuroscientist and person as a ZA.

NOTE Confidence: 0.93824085

 $00:31:13.500 \rightarrow 00:31:17.000$  So I'm really grateful for this opportunity.

NOTE Confidence: 0.93824085

 $00:31:17.000 \rightarrow 00:31:18.468$  So as Alex mentioned,

NOTE Confidence: 0.93824085

00:31:18.468 --> 00:31:21.482 I'm going to be discussing a study that

NOTE Confidence: 0.93824085

 $00{:}31{:}21{.}482 \dashrightarrow 00{:}31{:}24{.}442$  was completed in his lab and I'm now

NOTE Confidence: 0.93824085

 $00:31:24.442 \dashrightarrow 00:31:27.660$  carrying for this work in Al K's group.

NOTE Confidence: 0.93824085

 $00:31:27.660 \longrightarrow 00:31:30.271$  And it's focused on the short acting

NOTE Confidence: 0.93824085

00:31:30.271 --> 00:31:32.590 psychedelic called 5 Methoxy DMT and

NOTE Confidence: 0.93824085

 $00:31:32.590 \longrightarrow 00:31:35.460$  its effects on any behaviors and on

NOTE Confidence: 0.93824085

00:31:35.460 --> 00:31:37.498 structural plasticity and mouse models.

NOTE Confidence: 0.93396387125

00:31:41.020 --> 00:31:42.380 In terms of disclosures,

NOTE Confidence: 0.93396387125

 $00{:}31{:}42{.}380 \dashrightarrow 00{:}31{:}45{.}408$  I do have an SRA with Freedom

NOTE Confidence: 0.93396387125

 $00{:}31{:}45{.}408 \dashrightarrow 00{:}31{:}48{.}188$  Biosciences looking at this drug.

NOTE Confidence: 0.93396387125

 $00:31:48.190 \longrightarrow 00:31:50.630$  So as many people in this room know,

 $00{:}31{:}50{.}630 \dashrightarrow 00{:}31{:}52{.}850$  psyched elics have really been the the

NOTE Confidence: 0.93396387125

 $00:31:52.850 \rightarrow 00:31:55.133$  focus of this resurgence and interest

NOTE Confidence: 0.93396387125

 $00:31:55.133 \dashrightarrow 00:31:57.353$  in their potential uses as the rapeutics NOTE Confidence: 0.93396387125

 $00:31:57.353 \rightarrow 00:31:59.709$  for range of mental health disorders

NOTE Confidence: 0.93396387125

00:31:59.710 --> 00:32:01.828 ranging from mood disorders to PTSD,

NOTE Confidence: 0.93396387125

 $00:32:01.830 \longrightarrow 00:32:04.590$  substance use disorders and beyond.

NOTE Confidence: 0.93396387125

 $00{:}32{:}04{.}590 \dashrightarrow 00{:}32{:}06{.}350$  And I think you know thorough review of

NOTE Confidence: 0.93396387125

00:32:06.350 - 00:32:07.987 that topic is beyond our scope today,

NOTE Confidence: 0.93396387125

 $00{:}32{:}07{.}990 \dashrightarrow 00{:}32{:}10{.}078$  but I wanted to point out.

NOTE Confidence: 0.93396387125

 $00:32:10.080 \longrightarrow 00:32:12.474$  That two of these drugs have now

NOTE Confidence: 0.93396387125

 $00{:}32{:}12{.}474 \dashrightarrow 00{:}32{:}14{.}628$  reached phase three clinical trials and

NOTE Confidence: 0.93396387125

 $00{:}32{:}14.628 \dashrightarrow 00{:}32{:}17.212$  those are MDMA for PTSD and psilocybin

NOTE Confidence: 0.93396387125

 $00{:}32{:}17{.}212 \dashrightarrow 00{:}32{:}18{.}836$  for treatment resistant depression,

NOTE Confidence: 0.93396387125

 $00:32:18.840 \longrightarrow 00:32:22.146$  and these are both used in

NOTE Confidence: 0.93396387125

 $00:32:22.146 \dashrightarrow 00:32:23.799$  combination with psychotherapy.

NOTE Confidence: 0.93396387125

 $00:32:23.800 \longrightarrow 00:32:25.648$  And my interests have,

 $00:32:25.648 \longrightarrow 00:32:27.034$  as Alex said,

NOTE Confidence: 0.93396387125

 $00:32:27.040 \rightarrow 00:32:29.525$  been in understanding the neurobiology

NOTE Confidence: 0.93396387125

 $00{:}32{:}29{.}525 \dashrightarrow 00{:}32{:}32{.}078$  of depression in particular and in

NOTE Confidence: 0.93396387125

 $00:32:32.078 \longrightarrow 00:32:33.473$  the development of novel the rapeutics

NOTE Confidence: 0.93396387125

 $00{:}32{:}33{.}473 \dashrightarrow 00{:}32{:}35{.}360$  for treating a resistant depression.

NOTE Confidence: 0.93396387125

 $00{:}32{:}35{.}360 \dashrightarrow 00{:}32{:}37{.}720$  So I'm going to really focus on on

NOTE Confidence: 0.93396387125

 $00:32:37.720 \rightarrow 00:32:39.824$  this category called the tryptamine

NOTE Confidence: 0.93396387125

 $00{:}32{:}39{.}824 \dashrightarrow 00{:}32{:}41{.}756$  structural class of psyched elics,

NOTE Confidence: 0.93396387125

 $00:32:41.760 \longrightarrow 00:32:43.845$  of which psilocybin is probably

NOTE Confidence: 0.93396387125

 $00{:}32{:}43.845 \dashrightarrow 00{:}32{:}45.513$  the best known member.

NOTE Confidence: 0.93396387125

 $00{:}32{:}45{.}520 \dashrightarrow 00{:}32{:}48{.}536$  But I'm going to be talking more about

NOTE Confidence: 0.93396387125

 $00{:}32{:}48{.}536 \dashrightarrow 00{:}32{:}51{.}610$  this less studied but very interesting

NOTE Confidence: 0.93396387125

 $00:32:51.610 \dashrightarrow 00:32:53.762$  compound called fibrothoxy DMT.

NOTE Confidence: 0.93396387125

 $00{:}32{:}53{.}770 \dashrightarrow 00{:}32{:}55{.}858$  So you know what is the evidence from

NOTE Confidence: 0.93396387125

 $00{:}32{:}55{.}858 \dashrightarrow 00{:}32{:}57{.}799$  the clinical studies look like for the

 $00:32:57.799 \longrightarrow 00:32:59.578$  use of psychedelics in the treatment

NOTE Confidence: 0.93396387125

 $00:32:59.578 \dashrightarrow 00:33:01.408$  of mood disorders in particular.

NOTE Confidence: 0.93396387125

00:33:01.410 --> 00:33:03.433 So there have now been a number

NOTE Confidence: 0.93396387125

 $00:33:03.433 \rightarrow 00:33:05.086$  of clinical trials through phase

NOTE Confidence: 0.93396387125

 $00{:}33{:}05{.}086 \dashrightarrow 00{:}33{:}07{.}270$  two and into phase three with

NOTE Confidence: 0.93396387125

00:33:07.270 --> 00:33:08.624 psilocybin assisted psychotherapy

NOTE Confidence: 0.93396387125

 $00{:}33{:}08.624 \dashrightarrow 00{:}33{:}10.888$  for treatment resistant depression.

NOTE Confidence: 0.93396387125

 $00{:}33{:}10.890 \dashrightarrow 00{:}33{:}13.020$  And some of the more remarkable

NOTE Confidence: 0.93396387125

 $00{:}33{:}13.020 \dashrightarrow 00{:}33{:}15.128$  aspects of these these drugs are

NOTE Confidence: 0.93396387125

 $00:33:15.128 \longrightarrow 00:33:17.204$  their ability to induce a very

NOTE Confidence: 0.93396387125

 $00{:}33{:}17.204 \dashrightarrow 00{:}33{:}19.089$  rapid antidepressant effect,

NOTE Confidence: 0.93396387125

 $00:33:19.090 \rightarrow 00:33:22.990$  so one day after a single dose or two doses.

NOTE Confidence: 0.93396387125

 $00{:}33{:}22{.}990 \dashrightarrow 00{:}33{:}25{.}945$  As well as their enduring benefits and

NOTE Confidence: 0.93396387125

 $00:33:25.945 \rightarrow 00:33:28.785$  these vary from study to study a bit,

NOTE Confidence: 0.93396387125

 $00{:}33{:}28.790 \dashrightarrow 00{:}33{:}31.110$  but the earlier studies showed

NOTE Confidence: 0.93396387125

 $00:33:31.110 \longrightarrow 00:33:33.430$  antidepressant effects of psilocybin out

- NOTE Confidence: 0.93396387125
- $00:33:33.498 \rightarrow 00:33:36.305$  to three months following a dosing session.
- NOTE Confidence: 0.93396387125
- $00:33:36.310 \longrightarrow 00:33:37.326$  So that's pretty remarkable.
- NOTE Confidence: 0.93396387125
- $00:33:37.326 \rightarrow 00:33:39.179$  And even in the phase two COMPASS
- NOTE Confidence: 0.93396387125
- $00:33:39.179 \longrightarrow 00:33:40.589$  trial that I'm showing here,
- NOTE Confidence: 0.93396387125
- $00{:}33{:}40{.}590 \dashrightarrow 00{:}33{:}42{.}844$  we do see that the effects continue
- NOTE Confidence: 0.93396387125
- $00{:}33{:}42{.}844 \dashrightarrow 00{:}33{:}45{.}238$  to be quite enduring even with
- NOTE Confidence: 0.93396387125
- $00:33:45.238 \rightarrow 00:33:46.450$  these larger studies.
- NOTE Confidence: 0.93396387125
- $00{:}33{:}46{.}450 \dashrightarrow 00{:}33{:}48{.}620$  The drawback with the use of psilocybin
- NOTE Confidence: 0.93396387125
- $00{:}33{:}48.620 \dashrightarrow 00{:}33{:}50.904$  in a clinical setting is that these
- NOTE Confidence: 0.93396387125
- $00:33:50.904 \dashrightarrow 00:33:53.250$  dosing sessions take at least six hours.
- NOTE Confidence: 0.93396387125
- 00:33:53.250 --> 00:33:53.862 You know,
- NOTE Confidence: 0.93396387125
- $00:33:53.862 \longrightarrow 00:33:55.086$  they're very labor intensive.
- NOTE Confidence: 0.93396387125
- 00:33:55.090 --> 00:33:56.806 A trained therapist needs to be
- NOTE Confidence: 0.93396387125
- $00{:}33{:}56.806 \dashrightarrow 00{:}33{:}58.689$  with the person the entire time.
- NOTE Confidence: 0.93396387125
- 00:33:58.690 00:34:00.334 So if we're thinking about ways
- NOTE Confidence: 0.93396387125

 $00:34:00.334 \rightarrow 00:34:01.725$  that we could potentially translate

NOTE Confidence: 0.93396387125

 $00{:}34{:}01{.}725 \dashrightarrow 00{:}34{:}03{.}447$  the use of these to the clinic,

NOTE Confidence: 0.93396387125

 $00:34:03.450 \rightarrow 00:34:06.642$  the way in terms of scaling up and

NOTE Confidence: 0.93396387125

 $00:34:06.642 \rightarrow 00:34:08.928$  improving access for more patients,

NOTE Confidence: 0.93396387125

 $00{:}34{:}08{.}930 \dashrightarrow 00{:}34{:}12{.}171$  I think looking at a shorter acting

NOTE Confidence: 0.93396387125

 $00:34:12.171 \rightarrow 00:34:14.929$  compound does potentially very interesting.

NOTE Confidence: 0.93396387125

 $00:34:14.930 \longrightarrow 00:34:16.210$  So with that in mind,

NOTE Confidence: 0.93396387125

 $00:34:16.210 \longrightarrow 00:34:19.297$  I began this work on this short

NOTE Confidence: 0.93396387125

00:34:19.297 --> 00:34:20.620 acting serit<br/>inergic psychedelic

NOTE Confidence: 0.93396387125

 $00:34:20.698 \rightarrow 00:34:22.170$  called 5 Methoxy DMD.

NOTE Confidence: 0.93396387125

 $00:34:22.170 \longrightarrow 00:34:23.248$  If you've heard of this at all,

NOTE Confidence: 0.93396387125

 $00{:}34{:}23{.}250 \dashrightarrow 00{:}34{:}25{.}480$  you've probably seen the association

NOTE Confidence: 0.93396387125

 $00{:}34{:}25{.}480 \dashrightarrow 00{:}34{:}27{.}710$  with the Colorado River to ad

NOTE Confidence: 0.93396387125

 $00{:}34{:}27.780 \dashrightarrow 00{:}34{:}29.288$  that I'm showing here.

NOTE Confidence: 0.93396387125

 $00{:}34{:}29{.}290 \dashrightarrow 00{:}34{:}31{.}290$  This produces this compound

NOTE Confidence: 0.93396387125

 $00{:}34{:}31{.}290 \dashrightarrow 00{:}34{:}34{.}058$  and its parotid glands and now

- NOTE Confidence: 0.93396387125
- 00:34:34.058 --> 00:34:35.210 it's mostly synthesized
- NOTE Confidence: 0.9436080666666667
- $00:34:37.570 \longrightarrow 00:34:40.444$  synthetically so. So you know,
- NOTE Confidence: 0.9436080666666667
- $00:34:40.444 \rightarrow 00:34:43.250$  we we don't get it from the toads anymore.
- NOTE Confidence: 0.9436080666666667
- $00:34:43.250 \rightarrow 00:34:45.272$  And what's? Some of the pharmacokinetics
- NOTE Confidence: 0.9436080666666667
- $00{:}34{:}45{.}272 \dashrightarrow 00{:}34{:}47{.}560$  are really what make this remarkable.
- NOTE Confidence: 0.9436080666666667
- $00{:}34{:}47{.}560 \dashrightarrow 00{:}34{:}51{.}760$  So this drug is typically used either through
- NOTE Confidence: 0.9436080666666667
- $00:34:51.760 \longrightarrow 00:34:53.520$  inhalation or intranasal insufflation.
- NOTE Confidence: 0.9436080666666667
- $00:34:53.520 \rightarrow 00:34:56.795$  So the onset of action is very rapid and
- NOTE Confidence: 0.9436080666666667
- $00{:}34{:}56.795 \dashrightarrow 00{:}34{:}59.635$  the duration of the effects are very short,
- NOTE Confidence: 0.9436080666666667
- $00:34:59.640 \rightarrow 00:35:01.596$  usually resolving in about 20 minutes.
- NOTE Confidence: 0.9436080666666667
- $00:35:01.600 \dashrightarrow 00:35:03.610$  So this makes this really appealing
- NOTE Confidence: 0.9436080666666667
- $00:35:03.610 \rightarrow 00:35:05.354$  if we're thinking about potentially
- NOTE Confidence: 0.9436080666666667
- $00:35:05.354 \rightarrow 00:35:07.430$  getting this drug to more patients
- NOTE Confidence: 0.9436080666666667
- $00:35:07.430 \longrightarrow 00:35:09.508$  and being able to really effectively
- NOTE Confidence: 0.9436080666666667
- $00:35:09.508 \rightarrow 00:35:12.316$  implement this in the clinical setting.
- NOTE Confidence: 0.9436080666666667

 $00:35:12.320 \longrightarrow 00:35:14.957$  And I just wanted to point out that in

NOTE Confidence: 0.9436080666666667

 $00:35:14.957 \rightarrow 00:35:17.516$  terms of the pharmacology of this drug,

NOTE Confidence: 0.9436080666666667

00:35:17.520 --> 00:35:20.280 it targets serotonin 2A receptors

NOTE Confidence: 0.9436080666666667

 $00:35:20.280 \longrightarrow 00:35:22.650$  just like all of these classical

NOTE Confidence: 0.9436080666666667

 $00:35:22.650 \dashrightarrow 00:35:23.835$  serotonergic psyched elics do.

NOTE Confidence: 0.9436080666666667

 $00{:}35{:}23{.}840 \dashrightarrow 00{:}35{:}25{.}772$  The 2A receptors are thought to be

NOTE Confidence: 0.9436080666666667

 $00:35:25.772 \rightarrow 00:35:27.680$  responsible for the psychedelic effects.

NOTE Confidence: 0.9436080666666667

00:35:27.680 --> 00:35:29.432 There's still, I think,

NOTE Confidence: 0.9436080666666667

 $00{:}35{:}29{.}432 \dashrightarrow 00{:}35{:}31{.}622$  an ongoing debate about their

NOTE Confidence: 0.9436080666666667

 $00:35:31.622 \rightarrow 00:35:33.799$  necessity for the rapeutic effects.

NOTE Confidence: 0.9436080666666667

 $00{:}35{:}33{.}800 \dashrightarrow 00{:}35{:}36{.}810$  And this drug also targets seroton in 1A

NOTE Confidence: 0.9436080666666667

 $00{:}35{:}36{.}810 \dashrightarrow 00{:}35{:}38{.}400$  receptors with a pretty high affinity,

NOTE Confidence: 0.9436080666666667

 $00{:}35{:}38{.}400 \dashrightarrow 00{:}35{:}41{.}220$  which makes it a little unique

NOTE Confidence: 0.9436080666666667

 $00:35:41.220 \longrightarrow 00:35:42.630$  compared to psilocybin.

NOTE Confidence: 0.9436080666666667

 $00:35:42.630 \dashrightarrow 00:35:45.372$  So looking at clinical studies of

NOTE Confidence: 0.9436080666666667

 $00:35:45.372 \rightarrow 00:35:48.149$  five methoxy DMT as Alex said,

 $00:35:48.150 \longrightarrow 00:35:50.870$  sorry these are are pretty early.

NOTE Confidence: 0.9436080666666667

 $00{:}35{:}50.870 \dashrightarrow 00{:}35{:}53.198$  We have a few observational studies

NOTE Confidence: 0.9436080666666667

 $00:35:53.198 \dashrightarrow 00:35:55.718$  that do suggest that a single dose

NOTE Confidence: 0.9436080666666667

 $00:35:55.718 \dashrightarrow 00:35:58.434$  of this drug can produce relief of

NOTE Confidence: 0.9436080666666667

 $00{:}35{:}58{.}434 \dashrightarrow 00{:}36{:}00{.}741$  depression and anxiety symptoms and

NOTE Confidence: 0.9436080666666667

 $00:36:00.741 \rightarrow 00:36:02.367$  potentially a long lasting way at

NOTE Confidence: 0.9436080666666667

 $00:36:02.367 \longrightarrow 00:36:04.168$  least from the data that we have.

NOTE Confidence: 0.9436080666666667

 $00:36:04.170 \longrightarrow 00:36:05.899$  And the day that I'm showing here

NOTE Confidence: 0.9436080666666667

 $00{:}36{:}05{.}899 \dashrightarrow 00{:}36{:}07{.}801$  is from an observational study in

NOTE Confidence: 0.9436080666666667

 $00:36:07.801 \longrightarrow 00:36:09.631$  a naturalistic setting where people

NOTE Confidence: 0.9436080666666667

 $00:36:09.631 \rightarrow 00:36:11.854$  use an inhaled form of five methoxy

NOTE Confidence: 0.9436080666666667

 $00{:}36{:}11{.}854 \dashrightarrow 00{:}36{:}13{.}758$  DMT and then they self reported

NOTE Confidence: 0.9436080666666667

 $00:36:13.758 \longrightarrow 00:36:15.162$  symptoms of depression,

NOTE Confidence: 0.9436080666666667

 $00{:}36{:}15{.}162 \dashrightarrow 00{:}36{:}18{.}034$  anxiety and stress at various time points.

NOTE Confidence: 0.9436080666666667

 $00{:}36{:}18.034 \dashrightarrow 00{:}36{:}20.995$  And they did see improvement in all of

 $00:36:20.995 \rightarrow 00:36:23.763$  these measures at 30 days following the drug.

NOTE Confidence: 0.9436080666666667

 $00{:}36{:}23.770 \dashrightarrow 00{:}36{:}24.926$  As Alex also mentioned,

NOTE Confidence: 0.9436080666666667

 $00:36:24.926 \longrightarrow 00:36:26.660$  there have been some phase two

NOTE Confidence: 0.9436080666666667

 $00:36:26.714 \longrightarrow 00:36:27.570$  clinical trials.

NOTE Confidence: 0.9436080666666667

 $00:36:27.570 \dashrightarrow 00:36:29.050$  There's one that's been completed.

NOTE Confidence: 0.9436080666666667

 $00:36:29.050 \longrightarrow 00:36:31.606$  So far we don't have the full data set,

NOTE Confidence: 0.9436080666666667

 $00:36:31.610 \longrightarrow 00:36:34.010$  but based on the press release.

NOTE Confidence: 0.9436080666666667

 $00:36:34.010 \rightarrow 00:36:36.350$  They had some promising results and

NOTE Confidence: 0.9436080666666667

 $00:36:36.350 \dashrightarrow 00:36:38.769$  that was published from GH Research.

NOTE Confidence: 0.9436080666666667

 $00:36:38.770 \rightarrow 00:36:41.906$  It's a study of eight patients with

NOTE Confidence: 0.9436080666666667

 $00{:}36{:}41.906 \dashrightarrow 00{:}36{:}43.250$  treatment resistant depression.

NOTE Confidence: 0.9436080666666667

 $00{:}36{:}43.250 \dashrightarrow 00{:}36{:}45.527$  And the data that we have so far showed

NOTE Confidence: 0.9436080666666667

 $00:36:45.527 \rightarrow 00:36:47.743$  that seven out of eight patients

NOTE Confidence: 0.9436080666666667

 $00:36:47.743 \longrightarrow 00:36:49.643$  achieved remission in their depressive

NOTE Confidence: 0.9436080666666667

 $00:36:49.703 \rightarrow 00:36:51.870$  symptoms at seven days following an

NOTE Confidence: 0.9436080666666667

 $00:36:51.870 \rightarrow 00:36:54.570$  escalating dose regimen of this drug.

 $00:36:54.570 \longrightarrow 00:36:57.020$  So they basically gave them enough to

NOTE Confidence: 0.9436080666666667

 $00:36:57.020 \rightarrow 00:36:59.521$  achieve a strong psychedelic effect and

NOTE Confidence: 0.9436080666666667

 $00{:}36{:}59{.}521 \dashrightarrow 00{:}37{:}02{.}287$  then looked at their depression symptoms.

NOTE Confidence: 0.9436080666666667

 $00:37:02.290 \longrightarrow 00:37:03.970$  So I'm really interested in

NOTE Confidence: 0.9436080666666667

 $00:37:03.970 \rightarrow 00:37:05.650$  understanding on a mechanistic level,

NOTE Confidence: 0.9436080666666667

 $00{:}37{:}05{.}650 \dashrightarrow 00{:}37{:}07{.}876$  how a single dose of a psychedelic

NOTE Confidence: 0.9436080666666667

 $00:37:07.876 \dashrightarrow 00:37:10.227$  drug can produce these very long

NOTE Confidence: 0.9436080666666667

 $00:37:10.227 \rightarrow 00:37:12.007$  lasting improvements and symptoms.

NOTE Confidence: 0.9436080666666667

 $00{:}37{:}12.010 \dashrightarrow 00{:}37{:}14.572$  And one potential explanation for this is

NOTE Confidence: 0.9436080666666667

00:37:14.572 --> 00:37:16.650 through enhancement of neuroplasticity.

NOTE Confidence: 0.9436080666666667

 $00:37:16.650 \longrightarrow 00:37:18.585$  So neuroplasticity is generally an

NOTE Confidence: 0.9436080666666667

 $00{:}37{:}18.585 \dashrightarrow 00{:}37{:}21.564$  increase in the number or the strength

NOTE Confidence: 0.9436080666666667

 $00:37:21.564 \rightarrow 00:37:24.004$  of synaptic connections between neurons.

NOTE Confidence: 0.9436080666666667

 $00{:}37{:}24.010 \dashrightarrow 00{:}37{:}26.100$  Deficits in neuroplasticity have been

NOTE Confidence: 0.9436080666666667

 $00{:}37{:}26.100 \dashrightarrow 00{:}37{:}28.190$  noted in patients with depression.
00:37:28.190 --> 00:37:29.096 And furthermore,

NOTE Confidence: 0.9436080666666667

 $00:37:29.096 \rightarrow 00:37:31.361$  we know that antidepressants can

NOTE Confidence: 0.9436080666666667

00:37:31.361 --> 00:37:33.380 enhance neural plasticity on a

NOTE Confidence: 0.9436080666666667

 $00:37:33.380 \dashrightarrow 00:37:35.150$  time scale that seems to correlate

NOTE Confidence: 0.9436080666666667

 $00:37:35.150 \dashrightarrow 00:37:36.546$  with their the rapeutic effects.

NOTE Confidence: 0.9436080666666667

 $00{:}37{:}36{.}546 \dashrightarrow 00{:}37{:}39{.}416$  So if we're looking at measures of sort

NOTE Confidence: 0.9436080666666667

 $00:37:39.416 \longrightarrow 00:37:41.216$  of antidepressant efficacy that can

NOTE Confidence: 0.9436080666666667

 $00:37:41.216 \rightarrow 00:37:43.349$  translate across from humans to rodents,

NOTE Confidence: 0.9436080666666667

 $00:37:43.350 \longrightarrow 00:37:45.550$  this is a useful one to look at.

NOTE Confidence: 0.9436080666666667

 $00{:}37{:}45{.}550 \dashrightarrow 00{:}37{:}47{.}626$  We know that chronic use of

NOTE Confidence: 0.9436080666666667

 $00{:}37{:}47.626 \dashrightarrow 00{:}37{:}49.010$  fluoxetine that can increase

NOTE Confidence: 0.941303815625

 $00:37:49.078 \dashrightarrow 00:37:51.430$  the density of these dendrotic spines,

NOTE Confidence: 0.941303815625

 $00:37:51.430 \longrightarrow 00:37:55.206$  which is are these protrusions where most of

NOTE Confidence: 0.941303815625

 $00:37:55.206 \rightarrow 00:37:57.890$  synaptic connections form on the dendrite.

NOTE Confidence: 0.941303815625

 $00:37:57.890 \rightarrow 00:38:00.500$  And antidepressant doses of ketamine acutely

NOTE Confidence: 0.941303815625

 $00:38:00.569 \rightarrow 00:38:03.005$  increase the density of these spines.

 $00:38:03.010 \longrightarrow 00:38:05.040$  So again, this correlates with the time

NOTE Confidence: 0.941303815625

 $00{:}38{:}05{.}040 \dashrightarrow 00{:}38{:}07{.}049$  scale of their the rapeutic effects.

NOTE Confidence: 0.941303815625

 $00{:}38{:}07{.}050 \dashrightarrow 00{:}38{:}09{.}939$  So what do we know about the effects of

NOTE Confidence: 0.941303815625

 $00:38:09.939 \longrightarrow 00:38:11.928$  psychedelics on neuroplasticity so far?

NOTE Confidence: 0.941303815625

 $00:38:11.930 \longrightarrow 00:38:14.394$  So this is taken from a really

NOTE Confidence: 0.941303815625

 $00{:}38{:}14{.}394 \dashrightarrow 00{:}38{:}16{.}849$  nice paper that was published in

NOTE Confidence: 0.941303815625

00:38:16.849 --> 00:38:18.322 Neuron from Alex's group.

NOTE Confidence: 0.941303815625

00:38:18.322 --> 00:38:20.730 It was led by Link Shaw Show.

NOTE Confidence: 0.941303815625

 $00{:}38{:}20{.}730 \dashrightarrow 00{:}38{:}23{.}730$  And they looked at changes in the density

NOTE Confidence: 0.941303815625

 $00{:}38{:}23{.}730 \dashrightarrow 00{:}38{:}26{.}382$  of dendritic spines over a prolonged time

NOTE Confidence: 0.941303815625

 $00:38:26.382 \rightarrow 00:38:29.330$  period after a single dose of psilocybin.

NOTE Confidence: 0.941303815625

 $00{:}38{:}29{.}330 \dashrightarrow 00{:}38{:}30{.}730$  They're focused on the mouse

NOTE Confidence: 0.941303815625

 $00:38:30.730 \longrightarrow 00:38:31.570$  medial frontal cortex,

NOTE Confidence: 0.941303815625

 $00{:}38{:}31{.}570 \dashrightarrow 00{:}38{:}34{.}226$  which is an area that's been shown to

NOTE Confidence: 0.941303815625

 $00{:}38{:}34{.}226 \dashrightarrow 00{:}38{:}36{.}689$  be modulated by antidepressants before.

 $00:38:36.690 \rightarrow 00:38:40.170$  And if you focus on the the red graph here,

NOTE Confidence: 0.941303815625

 $00{:}38{:}40{.}170 \dashrightarrow 00{:}38{:}42{.}410$  you can see that after a single dose,

NOTE Confidence: 0.941303815625

00:38:42.410 --> 00:38:43.898 an injection of psilocybin,

NOTE Confidence: 0.941303815625

 $00:38:43.898 \longrightarrow 00:38:46.130$  they had noticed an increase in

NOTE Confidence: 0.941303815625

 $00{:}38{:}46{.}193 \dashrightarrow 00{:}38{:}48{.}395$  dendritic spine density at one day.

NOTE Confidence: 0.941303815625

 $00:38:48.400 \rightarrow 00:38:50.236$  And this persisted very long term,

NOTE Confidence: 0.941303815625

 $00:38:50.240 \longrightarrow 00:38:51.638$  over a month after that fall,

NOTE Confidence: 0.941303815625

 $00:38:51.640 \longrightarrow 00:38:53.095$  that single injection.

NOTE Confidence: 0.941303815625

 $00{:}38{:}53.095 \dashrightarrow 00{:}38{:}55.520$  So that was pretty remarkable.

NOTE Confidence: 0.941303815625

 $00{:}38{:}55{.}520 \dashrightarrow 00{:}38{:}57{.}176$  So the question that we wanted

NOTE Confidence: 0.941303815625

 $00{:}38{:}57{.}176 \dashrightarrow 00{:}38{:}59{.}299$  to answer in my study was whether

NOTE Confidence: 0.941303815625

 $00:38:59.299 \rightarrow 00:39:01.394$  this psychedelic was very short

NOTE Confidence: 0.941303815625

 $00:39:01.394 \rightarrow 00:39:03.070$  acting psychedelic effects could

NOTE Confidence: 0.941303815625

 $00:39:03.137 \rightarrow 00:39:05.117$  similarly alter neural plasticity.

NOTE Confidence: 0.941303815625

 $00{:}39{:}05{.}120 \dashrightarrow 00{:}39{:}05{.}752$  If so,

NOTE Confidence: 0.941303815625

 $00:39:05.752 \longrightarrow 00:39:07.332$  what are the time scales

- NOTE Confidence: 0.941303815625
- $00:39:07.332 \longrightarrow 00:39:09.040$  of those effects and.
- NOTE Confidence: 0.924126500769231
- 00:39:11.400 00:39:13.171 The first thing that we needed to
- NOTE Confidence: 0.924126500769231
- $00{:}39{:}13{.}171 \dashrightarrow 00{:}39{:}14{.}990$  do in this study was to evaluate,
- NOTE Confidence: 0.924126500769231
- $00:39:14.990 \longrightarrow 00:39:16.850$  you know, what is a psychedelic
- NOTE Confidence: 0.924126500769231
- $00{:}39{:}16.850 \dashrightarrow 00{:}39{:}18.757$  dose of this drug in a mouse.
- NOTE Confidence: 0.924126500769231
- 00:39:18.760 --> 00:39:20.440 You know, there's sort of limited
- NOTE Confidence: 0.924126500769231
- $00:39:20.440 \longrightarrow 00:39:22.296$  literature on this drug prior to
- NOTE Confidence: 0.924126500769231
- $00:39:22.296 \longrightarrow 00:39:24.504$  this and obviously we can't ask
- NOTE Confidence: 0.924126500769231
- 00:39:24.504 --> 00:39:27.068 the mouse if it's experiencing
- NOTE Confidence: 0.924126500769231
- $00:39:27.068 \rightarrow 00:39:29.978$  mystical type experiences or oceanic
- NOTE Confidence: 0.924126500769231
- $00:39:29.978 \rightarrow 00:39:31.440$  boundlessness as we do in people.
- NOTE Confidence: 0.924126500769231
- $00:39:31.440 \longrightarrow 00:39:33.258$  So we focus on this particular
- NOTE Confidence: 0.924126500769231
- $00{:}39{:}33{.}258 \dashrightarrow 00{:}39{:}34{.}934$  behavior that we can measure
- NOTE Confidence: 0.924126500769231
- $00{:}39{:}34{.}934 \dashrightarrow 00{:}39{:}36{.}919$  called the head twitch response.
- NOTE Confidence: 0.924126500769231
- $00{:}39{:}36{.}920 \dashrightarrow 00{:}39{:}38{.}594$  And as you can see here in this video,
- NOTE Confidence: 0.924126500769231

 $00:39:38.600 \longrightarrow 00:39:40.802$  it's this rapid side to side

NOTE Confidence: 0.924126500769231

 $00:39:40.802 \longrightarrow 00:39:42.270$  motion of the head.

NOTE Confidence: 0.924126500769231

00:39:42.270 --> 00:39:45.142 That has typically been used as a marker

NOTE Confidence: 0.924126500769231

 $00:39:45.142 \rightarrow 00:39:47.630$  of psychedelic effects in rodent studies.

NOTE Confidence: 0.924126500769231

 $00:39:47.630 \rightarrow 00:39:49.652$  Obviously, this doesn't really have peace

NOTE Confidence: 0.924126500769231

 $00:39:49.652 \rightarrow 00:39:51.510$  validity for psychedelic effects in humans.

NOTE Confidence: 0.924126500769231

 $00:39:51.510 \dashrightarrow 00:39:52.950$  This isn't what psychedelic

NOTE Confidence: 0.924126500769231

 $00:39:52.950 \longrightarrow 00:39:54.750$  effects look like in humans,

NOTE Confidence: 0.924126500769231

 $00{:}39{:}54.750 \dashrightarrow 00{:}39{:}56.226$  but has some predictability.

NOTE Confidence: 0.924126500769231

 $00:39:56.226 \dashrightarrow 00:39:58.440$  We know that drugs that target

NOTE Confidence: 0.924126500769231

 $00{:}39{:}58{.}507 \dashrightarrow 00{:}40{:}00{.}757$  the seroton in to a receptor that

NOTE Confidence: 0.924126500769231

 $00:40:00.757 \rightarrow 00:40:02.826$  have psychedelic effects in humans

NOTE Confidence: 0.924126500769231

 $00:40:02.826 \rightarrow 00:40:04.826$  induced this behavioral response,

NOTE Confidence: 0.924126500769231

 $00{:}40{:}04{.}830 \dashrightarrow 00{:}40{:}06{.}936$  whereas drugs that target those same

NOTE Confidence: 0.924126500769231

 $00:40:06.936 \rightarrow 00:40:08.713$  receptors that lack psychedelic effects

NOTE Confidence: 0.924126500769231

 $00{:}40{:}08.713 \dashrightarrow 00{:}40{:}10.925$  in humans do not produce this behavioral.

 $00:40:10.930 \longrightarrow 00:40:11.330$  Change.

NOTE Confidence: 0.944124138461539

 $00:40:14.130 \longrightarrow 00:40:16.530$  So the first part of the study was

NOTE Confidence: 0.944124138461539

 $00:40:16.530 \rightarrow 00:40:18.449$  measuring the head twitch response

NOTE Confidence: 0.944124138461539

 $00:40:18.450 \longrightarrow 00:40:20.431$  with a range of doses of five

NOTE Confidence: 0.944124138461539

 $00:40:20.431 \rightarrow 00:40:22.478$  methoxy DMT and we compared to

NOTE Confidence: 0.944124138461539

 $00:40:22.478 \longrightarrow 00:40:24.363$  psilocybin as a positive control.

NOTE Confidence: 0.944124138461539

 $00:40:24.370 \longrightarrow 00:40:26.610$  Psilocybin's been better characterized

NOTE Confidence: 0.944124138461539

 $00:40:26.610 \longrightarrow 00:40:29.906$  in this assay before and we're actually

NOTE Confidence: 0.944124138461539

 $00:40:29.906 \rightarrow 00:40:32.370$  able to do this using an automated

NOTE Confidence: 0.944124138461539

 $00:40:32.370 \rightarrow 00:40:36.120$  magnetic ear tag based technique.

NOTE Confidence: 0.944124138461539

 $00:40:36.120 \longrightarrow 00:40:37.576$  This was initially developed

NOTE Confidence: 0.944124138461539

00:40:37.576 --> 00:40:39.396 in Javier Gonzalez Myzo's lab,

NOTE Confidence: 0.944124138461539

 $00:40:39.400 \longrightarrow 00:40:41.668$  and it was actually kind of built

NOTE Confidence: 0.944124138461539

 $00:40:41.668 \longrightarrow 00:40:43.439$  from scratch by Mark Dibbs,

NOTE Confidence: 0.944124138461539

 $00{:}40{:}43{.}440 \dashrightarrow 00{:}40{:}45{.}281$  one of the students who was rotating

 $00:40:45.281 \longrightarrow 00:40:46.800$  in the lab at the time.

NOTE Confidence: 0.944124138461539

 $00:40:46.800 \longrightarrow 00:40:48.935$  This takes advantage of the fact that

NOTE Confidence: 0.944124138461539

 $00{:}40{:}48{.}935 \dashrightarrow 00{:}40{:}51{.}115$  the movement of a magnet within a

NOTE Confidence: 0.944124138461539

 $00:40:51.115 \rightarrow 00:40:53.357$  copper coil can generate A voltage that

NOTE Confidence: 0.944124138461539

 $00:40:53.357 \rightarrow 00:40:55.277$  can then be automatically detected,

NOTE Confidence: 0.944124138461539

 $00:40:55.280 \longrightarrow 00:40:58.170$  and we essentially just place the

NOTE Confidence: 0.944124138461539

 $00:40:58.170 \longrightarrow 00:40:59.760$  magnetic ear tag on the mouse.

NOTE Confidence: 0.944124138461539

 $00:40:59.760 \longrightarrow 00:41:01.559$  We put it into a container that's

NOTE Confidence: 0.944124138461539

 $00{:}41{:}01{.}559 \dashrightarrow 00{:}41{:}03{.}677$  lined with a copper coil and we get.

NOTE Confidence: 0.944124138461539

 $00:41:03.680 \longrightarrow 00:41:05.444$  An output on the number of head

NOTE Confidence: 0.944124138461539

 $00{:}41{:}05{.}444 \dashrightarrow 00{:}41{:}07{.}092$  twitches which is allows us to

NOTE Confidence: 0.944124138461539

 $00:41:07.092 \rightarrow 00:41:08.760$  really ramp these experiments up and

NOTE Confidence: 0.944124138461539

 $00{:}41{:}08.760 \dashrightarrow 00{:}41{:}10.635$  look at an extended period of time.

NOTE Confidence: 0.944124138461539

00:41:10.640 --> 00:41:12.800 So first we just validated this

NOTE Confidence: 0.944124138461539

 $00:41:12.800 \longrightarrow 00:41:15.068$  approach with a range of doses of

NOTE Confidence: 0.944124138461539

 $00:41:15.068 \rightarrow 00:41:17.480$  five methoxy DMT and with psilocybin

 $00:41:17.480 \longrightarrow 00:41:19.304$  and compared to hands board videos

NOTE Confidence: 0.944124138461539

 $00{:}41{:}19{.}304 \dashrightarrow 00{:}41{:}20{.}928$  and showed that this automated

NOTE Confidence: 0.944124138461539

 $00:41:20.928 \rightarrow 00:41:22.678$  system is working very well.

NOTE Confidence: 0.944124138461539

 $00:41:22.680 \rightarrow 00:41:26.372$  Those two measures are highly correlated and

NOTE Confidence: 0.944124138461539

 $00:41:26.372 \rightarrow 00:41:28.280$  then if we get into the actual data here,

NOTE Confidence: 0.944124138461539

 $00{:}41{:}28{.}280 \dashrightarrow 00{:}41{:}30{.}896$  so this is our time course over 60

NOTE Confidence: 0.944124138461539

 $00:41:30.896 \rightarrow 00:41:33.439$  minutes of the head twitch response.

NOTE Confidence: 0.944124138461539

 $00:41:33.440 \rightarrow 00:41:36.275$  And you can see the doses of five methoxy

NOTE Confidence: 0.944124138461539

00:41:36.275 --> 00:41:38.838 DMT in blue with psilocybin in red.

NOTE Confidence: 0.944124138461539

 $00{:}41{:}38{.}840 \dashrightarrow 00{:}41{:}40{.}840$  And the two things that I think are

NOTE Confidence: 0.944124138461539

 $00:41:40.840 \longrightarrow 00:41:42.435$  important to take away from this

NOTE Confidence: 0.944124138461539

00:41:42.435 --> 00:41:44.188 are number 15 Methoxy DMT induces

NOTE Confidence: 0.944124138461539

 $00:41:44.188 \longrightarrow 00:41:46.030$  a head twitch response that is

NOTE Confidence: 0.944124138461539

 $00{:}41{:}46.097 \dashrightarrow 00{:}41{:}47.276$  consistently brief regardless

NOTE Confidence: 0.944124138461539

 $00:41:47.276 \longrightarrow 00:41:49.634$  of the dose that we're testing,

 $00:41:49.640 \longrightarrow 00:41:52.640$  usually results within about 10 minutes.

NOTE Confidence: 0.944124138461539

 $00:41:52.640 \rightarrow 00:41:55.545$  And that's compared to psilocybin that has

NOTE Confidence: 0.944124138461539

 $00:41:55.545 \rightarrow 00:41:58.909$  this more long kind of protracted response.

NOTE Confidence: 0.944124138461539

 $00:41:58.910 \longrightarrow 00:41:59.293$  Interestingly,

NOTE Confidence: 0.944124138461539

 $00{:}41{:}59{.}293 \dashrightarrow 00{:}42{:}01{.}591$  increasing doses of the drug produce

NOTE Confidence: 0.944124138461539

 $00:42:01.591 \rightarrow 00:42:03.429$  increasing amounts of head twitch.

NOTE Confidence: 0.944124138461539

 $00{:}42{:}03{.}430 \dashrightarrow 00{:}42{:}06{.}083$  This seems to indicate that this behavior

NOTE Confidence: 0.944124138461539

 $00:42:06.083 \rightarrow 00:42:08.386$  could correlate also with the intensity

NOTE Confidence: 0.944124138461539

 $00:42:08.386 \rightarrow 00:42:10.588$  of the psychedelic effects as well.

NOTE Confidence: 0.944124138461539

 $00:42:10.590 \rightarrow 00:42:12.510$  And for our further studies,

NOTE Confidence: 0.944124138461539

 $00{:}42{:}12{.}510 \dashrightarrow 00{:}42{:}14{.}435$  we wanted to choose a dose of

NOTE Confidence: 0.944124138461539

 $00{:}42{:}14.435 \dashrightarrow 00{:}42{:}16.346$  five Methoxy DMT that was roughly

NOTE Confidence: 0.944124138461539

 $00:42:16.346 \longrightarrow 00:42:18.392$  equivalent to psilocybin in terms of

NOTE Confidence: 0.944124138461539

 $00:42:18.392 \longrightarrow 00:42:20.710$  the number of head twitches induced.

NOTE Confidence: 0.944124138461539

 $00:42:20.710 \longrightarrow 00:42:22.280$  So what's kind of a?

NOTE Confidence: 0.944124138461539

 $00:42:22.280 \rightarrow 00:42:24.730$  A similar intensity psychedelic dose

 $00:42:24.730 \longrightarrow 00:42:27.465$  of this drug and we ended up choosing

NOTE Confidence: 0.944124138461539

 $00:42:27.465 \longrightarrow 00:42:29.656$  the 20 mig per kick dose based on

NOTE Confidence: 0.944124138461539

 $00{:}42{:}29.656 \dashrightarrow 00{:}42{:}31.680$  the total number of hedge watches.

NOTE Confidence: 0.94427896

 $00{:}42{:}34{.}680 \dashrightarrow 00{:}42{:}38{.}928$  So there's kind of limited behavioral

NOTE Confidence: 0.94427896

 $00:42:38.928 \rightarrow 00:42:42.000$  data that characterizes psychedelics

NOTE Confidence: 0.94427896

 $00:42:42.000 \rightarrow 00:42:45.006$  in behaviors outside of the hedge witch.

NOTE Confidence: 0.94427896

 $00{:}42{:}45{.}010 \dashrightarrow 00{:}42{:}47{.}050$  And I think it's kind of important to

NOTE Confidence: 0.94427896

 $00:42:47.050 \rightarrow 00:42:49.489$  study a wider range of behaviors because,

NOTE Confidence: 0.94427896

 $00:42:49.490 \longrightarrow 00:42:51.140$  you know, these can give us

NOTE Confidence: 0.94427896

 $00:42:51.140 \longrightarrow 00:42:52.240$  insights into the mechanisms

NOTE Confidence: 0.94427896

 $00{:}42{:}52{.}290 \dashrightarrow 00{:}42{:}54{.}010$  underlying these psychedelic drugs.

NOTE Confidence: 0.94427896

 $00{:}42{:}54.010 \dashrightarrow 00{:}42{:}56.114$  And I think it's also important as people

NOTE Confidence: 0.94427896

00:42:56.114 --> 00:42:58.250 are thinking about screening novel compounds,

NOTE Confidence: 0.94427896

 $00:42:58.250 \rightarrow 00:42:59.636$  novel psychedelics potentially.

NOTE Confidence: 0.94427896

 $00:42:59.636 \rightarrow 00:43:02.408$  Now people are interested in drugs

 $00:43:02.408 \rightarrow 00:43:05.054$  that have sort of psychoplastogen

NOTE Confidence: 0.94427896

 $00:43:05.054 \rightarrow 00:43:07.170$  effects without psychedelic effects.

NOTE Confidence: 0.94427896

 $00{:}43{:}07{.}170 \dashrightarrow 00{:}43{:}09{.}378$  So I think having a battery of behavioral

NOTE Confidence: 0.94427896

 $00{:}43{:}09{.}378$  -->  $00{:}43{:}11{.}477$  as says that help us understand how these

NOTE Confidence: 0.94427896

 $00{:}43{:}11{.}477 \dashrightarrow 00{:}43{:}14{.}254$  drugs work is it's important and so.

NOTE Confidence: 0.94427896

 $00:43:14.254 \rightarrow 00:43:16.180$  Along those lines,

NOTE Confidence: 0.94427896

 $00:43:16.180 \longrightarrow 00:43:18.202$  a post back in the lab who's

NOTE Confidence: 0.94427896

 $00:43:18.202 \rightarrow 00:43:19.294$  now gone on to grad school,

NOTE Confidence: 0.94427896

00:43:19.300 --> 00:43:23.164 I<br/>an Gregg conducted this study of

NOTE Confidence: 0.94427896

 $00:43:23.164 \rightarrow 00:43:25.096$  social ultrasonic vocalizations.

NOTE Confidence: 0.94427896

00:43:25.100 --> 00:43:27.865 And this is a social behavior that's

NOTE Confidence: 0.94427896

 $00{:}43{:}27.865 \dashrightarrow 00{:}43{:}29.828$  produced during mating by males

NOTE Confidence: 0.94427896

 $00{:}43{:}29{.}828 \dashrightarrow 00{:}43{:}31{.}940$  when they're exposed to a female.

NOTE Confidence: 0.94427896

 $00:43:31.940 \longrightarrow 00:43:33.352$  The females produce these

NOTE Confidence: 0.94427896

00:43:33.352 --> 00:43:34.058 ultrasonic vocalizations,

NOTE Confidence: 0.94427896

 $00:43:34.060 \rightarrow 00:43:36.946$  but to a much lesser extent.

 $00{:}43{:}36{.}950 \dashrightarrow 00{:}43{:}40{.}082$  And he wanted to look at the changes in

NOTE Confidence: 0.94427896

 $00{:}43{:}40.082 \dashrightarrow 00{:}43{:}42.334$  social USV's with classical psyched elics,

NOTE Confidence: 0.94427896

 $00:43:42.334 \rightarrow 00:43:45.190$  so psilocybin and five methoxy DMT,

NOTE Confidence: 0.94427896

 $00:43:45.190 \longrightarrow 00:43:46.750$  as well as with ketamine,

NOTE Confidence: 0.94427896

 $00{:}43{:}46.750 \dashrightarrow 00{:}43{:}48.400$  which has kind of similar effects

NOTE Confidence: 0.94427896

 $00:43:48.400 \longrightarrow 00:43:48.950$  on neuroplasticity.

NOTE Confidence: 0.94427896

 $00{:}43{:}48{.}950 \dashrightarrow 00{:}43{:}51{.}622$  But I would expect the sort of acute

NOTE Confidence: 0.94427896

 $00:43:51.622 \rightarrow 00:43:53.311$  psychoactive effects to be quite

NOTE Confidence: 0.94427896

 $00:43:53.311 \longrightarrow 00:43:55.225$  different from those other two drugs.

NOTE Confidence: 0.94427896

 $00:43:55.230 \longrightarrow 00:43:58.194$  And he essentially measures this over

NOTE Confidence: 0.94427896

 $00:43:58.194 \rightarrow 00:44:01.176$  3 prerecording sessions and then a

NOTE Confidence: 0.94427896

 $00{:}44{:}01{.}176 \dashrightarrow 00{:}44{:}03{.}966$  session that's immediately after the drug.

NOTE Confidence: 0.94427896

 $00:44:03.970 \longrightarrow 00:44:04.568$  And interestingly,

NOTE Confidence: 0.94427896

 $00{:}44{:}04{.}568 \dashrightarrow 00{:}44{:}06{.}960$  what what was found was that all of

NOTE Confidence: 0.94427896

 $00:44:07.022 \rightarrow 00:44:09.128$  these drugs suppressed social US fees,

 $00:44:09.130 \longrightarrow 00:44:12.542$  but to very different degrees and in

NOTE Confidence: 0.94427896

00:44:12.542 --> 00:44:16.010 particular 5 methoxy DMT almost entirely

NOTE Confidence: 0.94427896

00:44:16.010 --> 00:44:17.810 suppressed ultrasonic vocalizations

NOTE Confidence: 0.94427896

 $00:44:17.810 \longrightarrow 00:44:20.210$  produced during meeting behavior.

NOTE Confidence: 0.94427896

 $00{:}44{:}20{.}210 \dashrightarrow 00{:}44{:}21{.}485$  Now thinking about the different

NOTE Confidence: 0.94427896

 $00:44:21.485 \longrightarrow 00:44:22.250$  interpretations of this,

NOTE Confidence: 0.94427896

 $00:44:22.250 \rightarrow 00:44:25.686$  I think there are there are multiple options,

NOTE Confidence: 0.94427896

 $00:44:25.690 \rightarrow 00:44:28.245$  but one possibility that we're toying with

NOTE Confidence: 0.94427896

 $00{:}44{:}28{.}245 \dashrightarrow 00{:}44{:}31{.}215$  is that this is really representative of

NOTE Confidence: 0.94427896

 $00:44:31.215 \rightarrow 00:44:33.921$  the intensity of the psychedelic effect.

NOTE Confidence: 0.94427896

 $00{:}44{:}33{.}930 \dashrightarrow 00{:}44{:}35{.}415$  Which would track from what

NOTE Confidence: 0.94427896

 $00:44:35.415 \longrightarrow 00:44:36.603$  we know from humans,

NOTE Confidence: 0.94427896

 $00{:}44{:}36{.}610 \dashrightarrow 00{:}44{:}38{.}192$  which is that even though this is

NOTE Confidence: 0.94427896

00:44:38.192 --> 00:44:39.730 a short acting psychedelic drug,

NOTE Confidence: 0.94427896

 $00:44:39.730 \longrightarrow 00:44:42.058$  the quality of the the psychedelic

NOTE Confidence: 0.94427896

 $00:44:42.058 \rightarrow 00:44:44.430$  experience is very intense and

- NOTE Confidence: 0.94427896
- $00:44:44.430 \longrightarrow 00:44:46.890$  indifferent from psilocybin.
- NOTE Confidence: 0.94427896
- $00{:}44{:}46{.}890 \dashrightarrow 00{:}44{:}48{.}810$  And I'm not going to go into this in detail,
- NOTE Confidence: 0.94427896
- $00:44:48.810 \rightarrow 00:44:51.690$  but essentially you can characterize
- NOTE Confidence: 0.94427896
- 00:44:51.690 --> 00:44:55.490 different forms of ultrasonic vocalizations,
- NOTE Confidence: 0.94427896
- $00{:}44{:}55{.}490 \dashrightarrow 00{:}44{:}58{.}190$  different patterns and we found
- NOTE Confidence: 0.94427896
- $00{:}44{:}58{.}190 \dashrightarrow 00{:}44{:}59{.}810$  that these different.
- NOTE Confidence: 0.94427896
- $00:44:59.810 \longrightarrow 00:45:02.600$  Novel antidepressants can modulate the
- NOTE Confidence: 0.94427896
- $00:45:02.600 \longrightarrow 00:45:04.832$  pattern of ultrasonic vocalizations
- NOTE Confidence: 0.94427896
- $00:45:04.832 \longrightarrow 00:45:07.209$  as well in particular ways.
- NOTE Confidence: 0.94427896
- 00:45:07.210 --> 00:45:07.507 OK,
- NOTE Confidence: 0.94427896
- $00:45:07.507 \rightarrow 00:45:09.289$  so the biggest question we wanted
- NOTE Confidence: 0.94427896
- $00{:}45{:}09{.}289 \dashrightarrow 00{:}45{:}11{.}665$  to answer in the study was related
- NOTE Confidence: 0.94427896
- $00{:}45{:}11.665 \dashrightarrow 00{:}45{:}13.445$  to changes in neural plasticity.
- NOTE Confidence: 0.94427896
- 00:45:13.450 --> 00:45:16.006 So the way we're able to do this is
- NOTE Confidence: 0.94427896
- $00{:}45{:}16.010 \dashrightarrow 00{:}45{:}18.720$  really this elegant approach that
- NOTE Confidence: 0.94427896

 $00:45:18.720 \longrightarrow 00:45:22.105$  utilizes in vivo longitudinal 2 photon

NOTE Confidence: 0.94427896

 $00:45:22.105 \rightarrow 00:45:25.230$  imaging of dendritic spines over time.

NOTE Confidence: 0.94427896

 $00:45:25.230 \longrightarrow 00:45:27.334$  And the way we do this is we

NOTE Confidence: 0.94427896

 $00{:}45{:}27{.}334 \dashrightarrow 00{:}45{:}29{.}554$  insert a cranial window over an

NOTE Confidence: 0.94427896

 $00:45:29.554 \rightarrow 00:45:31.984$  area of the medial frontal cortex,

NOTE Confidence: 0.94427896

00:45:31.990 --> 00:45:32.342 CG1M2,

NOTE Confidence: 0.94427896

 $00:45:32.342 \longrightarrow 00:45:34.806$  which again is that same region that

NOTE Confidence: 0.94427896

 $00:45:34.806 \rightarrow 00:45:36.390$  they investigated with psilocybin

NOTE Confidence: 0.94427896

 $00{:}45{:}36{.}390 \dashrightarrow 00{:}45{:}38{.}850$  that's been shown to be modulated

NOTE Confidence: 0.94427896

 $00:45:38.850 \longrightarrow 00:45:39.670$  with antidepressants.

NOTE Confidence: 0.94427896

 $00{:}45{:}39{.}670 \dashrightarrow 00{:}45{:}42{.}559$  And we do this in a thy 1G FP

NOTE Confidence: 0.94427896

 $00{:}45{:}42.559 \dashrightarrow 00{:}45{:}44.801$  mouse where there's a fluorescent

NOTE Confidence: 0.94427896

00:45:44.801 --> 00:45:47.507 reporter in layer 5 framinal neurons.

NOTE Confidence: 0.94427896

 $00:45:47.510 \rightarrow 00:45:49.712$  These neurons are important in receiving

NOTE Confidence: 0.94427896

 $00:45:49.712 \longrightarrow 00:45:51.590$  inputs across different cortical layers.

NOTE Confidence: 0.94427896

 $00:45:51.590 \rightarrow 00:45:54.670$  They're major output neuron from the cortex.

- NOTE Confidence: 0.94427896
- $00{:}45{:}54{.}670 \dashrightarrow 00{:}45{:}55{.}995$  That go to deeper brain

00:45:55.995 - 00:45:57.320 structures and they they project

NOTE Confidence: 0.941312905263158

 $00{:}45{:}57{.}369 \dashrightarrow 00{:}45{:}59{.}304$  to the other parts of the cortex as well.

NOTE Confidence: 0.941312905263158

 $00:45:59.310 \rightarrow 00:46:02.054$  So these are very important neurons and they

NOTE Confidence: 0.941312905263158

 $00:46:02.054 \rightarrow 00:46:04.708$  also highly express serotonin 2A receptors.

NOTE Confidence: 0.941312905263158

 $00{:}46{:}04{.}710 \dashrightarrow 00{:}46{:}07{.}006$  So we think that it makes sense that

NOTE Confidence: 0.941312905263158

 $00:46:07.006 \longrightarrow 00:46:09.431$  these could be like a direct or

NOTE Confidence: 0.941312905263158

 $00:46:09.431 \longrightarrow 00:46:11.221$  immediate target of psychedelic effects.

NOTE Confidence: 0.941312905263158

 $00:46:11.230 \longrightarrow 00:46:14.016$  So we're actually able to image their

NOTE Confidence: 0.941312905263158

 $00:46:14.016 \longrightarrow 00:46:16.441$  apical dendrites in layer one as

NOTE Confidence: 0.941312905263158

00:46:16.441 - > 00:46:20.320 shown here and this is our timing of.

NOTE Confidence: 0.941312905263158

 $00{:}46{:}20{.}320 \dashrightarrow 00{:}46{:}22{.}045$  Time scale of our experiments.

NOTE Confidence: 0.941312905263158

 $00{:}46{:}22.050 \dashrightarrow 00{:}46{:}24.012$  So we take two baseline imaging

NOTE Confidence: 0.941312905263158

 $00:46:24.012 \longrightarrow 00:46:25.930$  sessions prior to drug delivery,

NOTE Confidence: 0.941312905263158

 $00{:}46{:}25{.}930 \dashrightarrow 00{:}46{:}28{.}261$  which allows us to look at the

00:46:28.261 --> 00:46:29.849 spine dynamics prior to drug.

NOTE Confidence: 0.941312905263158

 $00:46:29.850 \rightarrow 00:46:31.470$  These spines are dynamically being

NOTE Confidence: 0.941312905263158

 $00{:}46{:}31{.}470 \dashrightarrow 00{:}46{:}33{.}610$  formed and eliminated all of the time.

NOTE Confidence: 0.941312905263158

 $00:46:33.610 \longrightarrow 00:46:35.346$  So it's important to sort of get

NOTE Confidence: 0.941312905263158

 $00:46:35.346 \longrightarrow 00:46:37.250$  a sense of the baseline there.

NOTE Confidence: 0.941312905263158

 $00:46:37.250 \longrightarrow 00:46:38.965$  And then we are able to image

NOTE Confidence: 0.941312905263158

 $00:46:38.965 \longrightarrow 00:46:40.290$  those exact same dendrites,

NOTE Confidence: 0.941312905263158

 $00:46:40.290 \rightarrow 00:46:42.270$  the exact same spines every

NOTE Confidence: 0.941312905263158

 $00:46:42.270 \longrightarrow 00:46:44.250$  two days for seven days.

NOTE Confidence: 0.941312905263158

 $00{:}46{:}44.250 \dashrightarrow 00{:}46{:}46.410$  And then we take a longer time point

NOTE Confidence: 0.941312905263158

 $00{:}46{:}46{.}410 \dashrightarrow 00{:}46{:}48{.}900$  at over a month and I think we could

NOTE Confidence: 0.941312905263158

 $00:46:48.900 \rightarrow 00:46:50.350$  actually carry these experiments out.

NOTE Confidence: 0.941312905263158

00:46:50.350 --> 00:46:52.228 At longer time points as well,

NOTE Confidence: 0.941312905263158

00:46:52.230 --> 00:46:54.630 something I'm curious about doing in

NOTE Confidence: 0.941312905263158

 $00{:}46{:}54{.}630 \dashrightarrow 00{:}46{:}56{.}918$  the future and this is just an example

NOTE Confidence: 0.941312905263158

 $00:46:56.918 \rightarrow 00:46:58.550$  of the beautiful images that we got.

 $00{:}47{:}00{.}950 \dashrightarrow 00{:}47{:}03{.}966$  So we did this in drugs treated with

NOTE Confidence: 0.93361721875

 $00{:}47{:}03.966 \dashrightarrow 00{:}47{:}06.394$  five methoxy DMT versus vehicle and

NOTE Confidence: 0.93361721875

 $00{:}47{:}06{.}394 \dashrightarrow 00{:}47{:}08{.}453$  we found surprisingly that treatment

NOTE Confidence: 0.93361721875

 $00{:}47{:}08{.}453 \dashrightarrow 00{:}47{:}11{.}400$  with five methoxy DMT is again a

NOTE Confidence: 0.93361721875

00:47:11.473 --> 00:47:13.788 single dose increases dendritic spine

NOTE Confidence: 0.93361721875

 $00{:}47{:}13.788 \dashrightarrow 00{:}47{:}16.880$  density at one day following injection.

NOTE Confidence: 0.93361721875

00:47:16.880 --> 00:47:18.172 And similar to psilocybin,

NOTE Confidence: 0.93361721875

 $00{:}47{:}18.172 \dashrightarrow 00{:}47{:}20.500$  this response really persists for over a

NOTE Confidence: 0.93361721875

 $00{:}47{:}20.500 \dashrightarrow 00{:}47{:}22.160$  month following that single injection.

NOTE Confidence: 0.93361721875

 $00{:}47{:}22.160 \dashrightarrow 00{:}47{:}24.480$  So even though there was acute effects of

NOTE Confidence: 0.93361721875

00:47:24.480 --> 00:47:27.364 the drug are wearing off within 2030 minutes,

NOTE Confidence: 0.93361721875

 $00{:}47{:}27{.}364 \dashrightarrow 00{:}47{:}29{.}774$  we're getting this really sustained

NOTE Confidence: 0.93361721875

 $00{:}47{:}29{.}774 \dashrightarrow 00{:}47{:}31{.}718$  enhancement of neuroplasticity which

NOTE Confidence: 0.93361721875

 $00{:}47{:}31.718 \dashrightarrow 00{:}47{:}33.878$  is pretty interesting and remarkable.

NOTE Confidence: 0.93361721875

 $00{:}47{:}33{.}880 \dashrightarrow 00{:}47{:}35{.}956$  The other measure of synaptic strength

 $00:47:35.956 \longrightarrow 00:47:38.716$  that we can look at is the size of

NOTE Confidence: 0.93361721875

 $00{:}47{:}38.716 \dashrightarrow 00{:}47{:}40.950$  spine heads or the spine head with.

NOTE Confidence: 0.93361721875

00:47:40.950 --> 00:47:43.218 This is a measure that is enhanced

NOTE Confidence: 0.93361721875

 $00:47:43.218 \longrightarrow 00:47:43.866$  by psilocybin.

NOTE Confidence: 0.93361721875

 $00{:}47{:}43.870 \dashrightarrow 00{:}47{:}45.382$  We found that this wasn't altered

NOTE Confidence: 0.93361721875

 $00:47:45.382 \rightarrow 00:47:46.390$  with five methoxy DMT,

NOTE Confidence: 0.93361721875

 $00{:}47{:}46.390 \dashrightarrow 00{:}47{:}48.478$  which is also kind of interesting

NOTE Confidence: 0.93361721875

 $00:47:48.478 \rightarrow 00:47:49.870$  that there's potentially these

NOTE Confidence: 0.93361721875

 $00:47:49.930 \longrightarrow 00:47:51.510$  divergent effects on the way,

NOTE Confidence: 0.93361721875

 $00{:}47{:}51{.}510 \dashrightarrow 00{:}47{:}53{.}662$  or at least different effects on the way

NOTE Confidence: 0.93361721875

 $00{:}47{:}53.662 \dashrightarrow 00{:}47{:}55.788$  that these drugs affect neuroplasticity.

NOTE Confidence: 0.918554740909091

 $00:47:57.830 \longrightarrow 00:48:00.070$  Finally, spine density is a factor of the NOTE Confidence: 0.918554740909091

 $00:48:00.070 \longrightarrow 00:48:02.538$  rate of formation of new spines and the NOTE Confidence: 0.918554740909091

 $00{:}48{:}02{.}538 \dashrightarrow 00{:}48{:}04{.}749$  rate of elimination of existing spines.

NOTE Confidence: 0.918554740909091

 $00{:}48{:}04.750 \dashrightarrow 00{:}48{:}07.452$  So we wanted to understand what was

NOTE Confidence: 0.918554740909091

 $00:48:07.452 \rightarrow 00:48:09.820$  underlying this change in spine density.

 $00:48:09.820 \rightarrow 00:48:13.340$  And we found that with five methoxy DMT,

NOTE Confidence: 0.918554740909091

 $00:48:13.340 \longrightarrow 00:48:14.995$  the formation rate of new

NOTE Confidence: 0.918554740909091

00:48:14.995 - 00:48:17.077 spines was increased at one and

NOTE Confidence: 0.918554740909091

00:48:17.077 --> 00:48:18.897 three days post drug injection,

NOTE Confidence: 0.918554740909091

 $00{:}48{:}18{.}900 \dashrightarrow 00{:}48{:}21{.}498$  whereas the elimination rate was unchanged.

NOTE Confidence: 0.918554740909091

 $00:48:21.500 \longrightarrow 00:48:22.685$  So really what's happening with

NOTE Confidence: 0.918554740909091

 $00:48:22.685 \rightarrow 00:48:24.140$  the drug is that we're getting

NOTE Confidence: 0.918554740909091

 $00:48:24.140 \longrightarrow 00:48:25.460$  a lot of new spines formed.

NOTE Confidence: 0.918554740909091

 $00:48:25.460 \longrightarrow 00:48:27.556$  We have an increase of about 15%,

NOTE Confidence: 0.918554740909091

00:48:27.556 --> 00:48:29.860 which is pretty significant

NOTE Confidence: 0.918554740909091

 $00:48:29.860 \rightarrow 00:48:33.184$  and they seem to be persisting

NOTE Confidence: 0.918554740909091

 $00{:}48{:}33{.}184 \dashrightarrow 00{:}48{:}34{.}860$  long term and not being eliminated.

NOTE Confidence: 0.907491211666667

 $00{:}48{:}37.010 \dashrightarrow 00{:}48{:}40.475$  So a summary of what I've shown so far

NOTE Confidence: 0.907491211666667

 $00{:}48{:}40.475 \dashrightarrow 00{:}48{:}42.803$  is that this short acting psychedelic

NOTE Confidence: 0.907491211666667

00:48:42.803 --> 00:48:45.120 5 Methoxy DMT elicits a very brief

 $00:48:45.177 \rightarrow 00:48:47.112$  head twitch response which mirrors

NOTE Confidence: 0.907491211666667

 $00{:}48{:}47.112 \dashrightarrow 00{:}48{:}49.047$  its psychedelic effects in humans.

NOTE Confidence: 0.907491211666667

00:48:49.050 --> 00:48:51.130 In terms of the duration,

NOTE Confidence: 0.9074912116666667

 $00:48:51.130 \rightarrow 00:48:54.460$  5 Methoxy DMT substantially suppresses

NOTE Confidence: 0.907491211666667

 $00:48:54.460 \longrightarrow 00:48:57.114$  social USB's which potentially could

NOTE Confidence: 0.907491211666667

 $00{:}48{:}57{.}114 \dashrightarrow 00{:}48{:}59{.}594$  could represent the intensity of

NOTE Confidence: 0.907491211666667

 $00{:}48{:}59{.}594 \dashrightarrow 00{:}49{:}02{.}088$  this acute psychedelic effects.

NOTE Confidence: 0.907491211666667

 $00{:}49{:}02.090 \dashrightarrow 00{:}49{:}04.022$  And a single dose of the short

NOTE Confidence: 0.907491211666667

00:49:04.022 --> 00:49:06.500 acting drug can produce long lasting

NOTE Confidence: 0.907491211666667

 $00:49:06.500 \rightarrow 00:49:08.090$  enhancements in neuroplasticity.

NOTE Confidence: 0.907491211666667

00:49:08.090 --> 00:49:10.274 And just to touch on a couple of

NOTE Confidence: 0.907491211666667

 $00:49:10.274 \longrightarrow 00:49:12.001$  the things that we're actively

NOTE Confidence: 0.907491211666667

 $00:49:12.001 \longrightarrow 00:49:13.489$  working on right now.

NOTE Confidence: 0.907491211666667

 $00:49:13.490 \longrightarrow 00:49:15.250$  So as Alex said, we're,

NOTE Confidence: 0.907491211666667

 $00{:}49{:}15{.}250 \dashrightarrow 00{:}49{:}18{.}310$  I'm pretty interested in combining sort

NOTE Confidence: 0.907491211666667

 $00:49:18.310 \longrightarrow 00:49:22.130$  of systems neuroscience tools with more

- NOTE Confidence: 0.907491211666667
- $00{:}49{:}22.130 \dashrightarrow 00{:}49{:}24.718$  molecular neuroscience tools as well.
- NOTE Confidence: 0.907491211666667
- 00:49:24.718 --> 00:49:27.094 My background is more in molecular
- NOTE Confidence: 0.907491211666667
- $00{:}49{:}27.094 \dashrightarrow 00{:}49{:}29.369$  and behavioral neuroscience.
- NOTE Confidence: 0.9074912116666667
- $00{:}49{:}29{.}370 \dashrightarrow 00{:}49{:}30{.}980$  And the questions I'm interested
- NOTE Confidence: 0.9074912116666667
- $00:49:30.980 \longrightarrow 00:49:32.810$  in addressing are related to #1.
- NOTE Confidence: 0.907491211666667
- $00{:}49{:}32.810 \dashrightarrow 00{:}49{:}34.685$  What's responsible for the acute
- NOTE Confidence: 0.907491211666667
- 00:49:34.685 --> 00:49:37.370 effects of this drug on plasticity?
- NOTE Confidence: 0.907491211666667
- $00:49:37.370 \longrightarrow 00:49:39.122$  And maybe more importantly,
- NOTE Confidence: 0.9074912116666667
- $00:49:39.122 \longrightarrow 00:49:41.750$  why are there such enduring effects
- NOTE Confidence: 0.907491211666667
- $00:49:41.823 \rightarrow 00:49:44.048$  of this drug on neuroplasticity?
- NOTE Confidence: 0.907491211666667
- 00:49:44.050 --> 00:49:45.370 So trying to understand, you know,
- NOTE Confidence: 0.9074912116666667
- $00:49:45.370 \longrightarrow 00:49:48.079$  what is it about these centritic spines
- NOTE Confidence: 0.907491211666667
- $00:49:48.079 \rightarrow 00:49:50.686$  that's causing them to last so long term?
- NOTE Confidence: 0.907491211666667
- $00{:}49{:}50{.}690 \dashrightarrow 00{:}49{:}51{.}850$  And if people have questions,
- NOTE Confidence: 0.907491211666667
- $00{:}49{:}51{.}850 \dashrightarrow 00{:}49{:}54{.}482$  I can talk more about the the
- NOTE Confidence: 0.907491211666667

00:49:54.482 --> 00:49:56.468 specifics of these, you know, finally.

NOTE Confidence: 0.907491211666667

 $00{:}49{:}56.468 \dashrightarrow 00{:}49{:}57.898$  What are the behavioral consequences

NOTE Confidence: 0.907491211666667

 $00:49:57.898 \longrightarrow 00:49:58.880$  of these changes?

NOTE Confidence: 0.907491211666667

00:49:58.880 - 00:50:00.536 I think it's overly simplistic to

NOTE Confidence: 0.907491211666667

 $00:50:00.536 \rightarrow 00:50:02.530$  say that plasticity is all good and

NOTE Confidence: 0.907491211666667

 $00:50:02.530 \dashrightarrow 00:50:03.920$  all the rapeutic in every region.

NOTE Confidence: 0.9074912116666667

00:50:03.920 --> 00:50:06.440 So really understanding, you know,

NOTE Confidence: 0.907491211666667

 $00:50:06.440 \longrightarrow 00:50:06.751 \#1,$ 

NOTE Confidence: 0.907491211666667

 $00:50:06.751 \rightarrow 00:50:09.239$  is this change specific to this brain region?

NOTE Confidence: 0.907491211666667

00:50:09.240 --> 00:50:11.958 And if so,

NOTE Confidence: 0.907491211666667

 $00:50:11.960 \rightarrow 00:50:14.680$  what are the behavioral consequences?

NOTE Confidence: 0.907491211666667

 $00:50:14.680 \longrightarrow 00:50:16.300$  If it's happening brain wide

NOTE Confidence: 0.9074912116666667

 $00:50:16.300 \longrightarrow 00:50:17.920$  that would also be interesting.

NOTE Confidence: 0.907491211666667

 $00{:}50{:}17{.}920 \dashrightarrow 00{:}50{:}20{.}044$  I think there's there's a lot

NOTE Confidence: 0.907491211666667

 $00:50:20.044 \rightarrow 00:50:21.460$  of open questions there.

NOTE Confidence: 0.907491211666667

 $00:50:21.460 \longrightarrow 00:50:22.504$  And then finally,

 $00:50:22.504 \rightarrow 00:50:24.940$  we're also interested in looking at other

NOTE Confidence: 0.907491211666667

 $00:50:25.005 \rightarrow 00:50:27.130$  classes of psychedelics and looking

NOTE Confidence: 0.907491211666667

 $00:50:27.130 \longrightarrow 00:50:29.255$  at their effects on neuroplasticity.

NOTE Confidence: 0.907491211666667

 $00:50:29.260 \longrightarrow 00:50:31.588$  I will mention that we've now

NOTE Confidence: 0.9074912116666667

 $00:50:31.588 \rightarrow 00:50:34.032$  completed a study with MDMA looking

NOTE Confidence: 0.907491211666667

 $00:50:34.032 \rightarrow 00:50:36.460$  at neuroplasticity over time and

NOTE Confidence: 0.907491211666667

 $00:50:36.460 \rightarrow 00:50:41.310$  we've actually found that MDMA looks.

NOTE Confidence: 0.907491211666667

 $00:50:41.310 \longrightarrow 00:50:42.626$  Pretty interesting as well.

NOTE Confidence: 0.907491211666667

 $00:50:42.626 \rightarrow 00:50:44.600$  It induces very robust increases in

NOTE Confidence: 0.907491211666667

 $00:50:44.654 \rightarrow 00:50:46.429$  neuroplasticity in the short term,

NOTE Confidence: 0.907491211666667

 $00:50:46.430 \longrightarrow 00:50:48.728$  but the dynamics of the changes

NOTE Confidence: 0.907491211666667

 $00{:}50{:}48.728$  -->  $00{:}50{:}51.524$  over time are different from the

NOTE Confidence: 0.907491211666667

 $00:50:51.524 \rightarrow 00:50:54.550$  serotonergic psychedelics Okay.

NOTE Confidence: 0.907491211666667

 $00{:}50{:}54{.}550 \dashrightarrow 00{:}50{:}57{.}181$  And just a thank you again to

NOTE Confidence: 0.9074912116666667

 $00{:}50{:}57{.}181 \dashrightarrow 00{:}50{:}59{.}767$  the Westman Award Committee to my

 $00:50:59.767 \rightarrow 00:51:01.905$  plethora of amazing mentors that

NOTE Confidence: 0.907491211666667

00:51:01.905 --> 00:51:03.825 I've had here at Yale.

NOTE Confidence: 0.907491211666667

00:51:03.830 --> 00:51:06.116 Alex, Al Marina,

NOTE Confidence: 0.9074912116666667

 $00{:}51{:}06{.}116 \dashrightarrow 00{:}51{:}06{.}878$  Chris.

NOTE Confidence: 0.907491211666667

 $00{:}51{:}06{.}880 \dashrightarrow 00{:}51{:}08{.}812$  And I'm only mentioning people in

NOTE Confidence: 0.907491211666667

 $00{:}51{:}08{.}812 \dashrightarrow 00{:}51{:}10{.}962$  the Quan lab who directly contributed

NOTE Confidence: 0.9074912116666667

 $00{:}51{:}10.962 \dashrightarrow 00{:}51{:}13.356$  to this study because their group

NOTE Confidence: 0.907491211666667

 $00:51:13.356 \rightarrow 00:51:15.972$  is ever expanding and then as well

NOTE Confidence: 0.907491211666667

00:51:15.972 --> 00:51:18.130 to to the K lab in particular,

NOTE Confidence: 0.9074912116666667

00:51:18.130 --> 00:51:20.545 Patrick is a post grad working with

NOTE Confidence: 0.9074912116666667

 $00{:}51{:}20{.}545 \dashrightarrow 00{:}51{:}23{.}700$  me who really did the the majority

NOTE Confidence: 0.9074912116666667

 $00:51:23.700 \longrightarrow 00:51:26.145$  of the MDMA spine work and we're

NOTE Confidence: 0.907491211666667

 $00:51:26.145 \longrightarrow 00:51:28.540$  going to be sad to to lose him

NOTE Confidence: 0.907491211666667

 $00:51:28.540 \longrightarrow 00:51:30.040$  to grad school next year.

NOTE Confidence: 0.907491211666667

 $00{:}51{:}30{.}040 \dashrightarrow 00{:}51{:}31{.}839$  So I'm happy to take any questions.

NOTE Confidence: 0.907491211666667

00:51:31.840 --> 00:51:32.200 Thank you.

- NOTE Confidence: 0.935679327272727
- $00:51:48.370 \longrightarrow 00:51:49.440$  glad that nobody has to
- NOTE Confidence: 0.935679327272727
- $00:51:49.440 \longrightarrow 00:51:50.810$  lick the toads to do this.
- NOTE Confidence: 0.935679327272727
- $00:51:50.810 \longrightarrow 00:51:53.916$  this. is great, great, talk.
- NOTE Confidence: 0.935679327272727
- $00:51:53.916 \rightarrow 00:51:57.130$  I'm wondering if this finding that you
- NOTE Confidence: 0.935679327272727
- 00:51:57.130 --> 00:51:58.810 have because it was so substantial,
- NOTE Confidence: 0.935679327272727
- $00{:}51{:}58{.}810 \dashrightarrow 00{:}52{:}00{.}960$  the increase in spine creation
- NOTE Confidence: 0.935679327272727
- $00:52:00.960 \longrightarrow 00:52:03.700$  on that 24 hour time point.
- NOTE Confidence: 0.935679327272727
- $00{:}52{:}03.700 \dashrightarrow 00{:}52{:}06.052$  Whether there are PET imaging possibilities
- NOTE Confidence: 0.935679327272727
- $00:52:06.052 \longrightarrow 00:52:08.420$  in humans that could be parallel.
- NOTE Confidence: 0.935679327272727
- $00{:}52{:}08{.}420 \dashrightarrow 00{:}52{:}11{.}410$  I know the SV2 PET leg and mainly looks at
- NOTE Confidence: 0.935679327272727
- 00:52:11.483 --> 00:52:14.160 presynaptic markers of synapse structure.
- NOTE Confidence: 0.935679327272727
- $00{:}52{:}14.160 \dashrightarrow 00{:}52{:}16.525$  Is there something that you can
- NOTE Confidence: 0.935679327272727
- $00:52:16.525 \rightarrow 00:52:18.821$  look at that's more presynaptic just
- NOTE Confidence: 0.935679327272727
- 00:52:18.821 --> 00:52:20.856 to parallel that postsynaptic that
- NOTE Confidence: 0.935679327272727
- $00:52:20.856 \rightarrow 00:52:22.980$  might actually translate to a human
- NOTE Confidence: 0.935679327272727

00:52:22.980 --> 00:52:26.858 imaging study pretty quickly, Yeah,

NOTE Confidence: 0.935679327272727

 $00{:}52{:}26.858 \dashrightarrow 00{:}52{:}29.246$  that that translational aspect is is

NOTE Confidence: 0.935679327272727

 $00{:}52{:}29{.}246 \dashrightarrow 00{:}52{:}31{.}937$  very interesting to me as well, yeah.

NOTE Confidence: 0.935679327272727

 $00:52:31.937 \rightarrow 00:52:35.894$  I think that you know certainly with

NOTE Confidence: 0.935679327272727

 $00:52:35.894 \rightarrow 00:52:38.149$  kind of more classical immunohisto

NOTE Confidence: 0.935679327272727

 $00:52:38.149 \longrightarrow 00:52:40.049$  chemistry looking at pre synaptic

NOTE Confidence: 0.935679327272727

 $00{:}52{:}40.049 \dashrightarrow 00{:}52{:}42.650$  markers that could be like a kind of

NOTE Confidence: 0.935679327272727

 $00:52:42.650 \rightarrow 00:52:46.250$  quicker way of getting at that question.

NOTE Confidence: 0.935679327272727

 $00{:}52{:}46.250 \dashrightarrow 00{:}52{:}48.772$  You know we could just take for example

NOTE Confidence: 0.935679327272727

 $00{:}52{:}48.772 \dashrightarrow 00{:}52{:}50.700$  a shorter time point and just see if

NOTE Confidence: 0.935679327272727

 $00{:}52{:}50{.}752 \dashrightarrow 00{:}52{:}52{.}649$  the changes in pre synaptic marker is

NOTE Confidence: 0.935679327272727

 $00:52:52.649 \dashrightarrow 00:52:54.368$  parallel the the increases in the.

NOTE Confidence: 0.938423890909091

 $00{:}52{:}57{.}050 \dashrightarrow 00{:}52{:}58{.}928$  Starting point, I know a lot

NOTE Confidence: 0.938423890909091

 $00{:}52{:}58{.}928 \dashrightarrow 00{:}53{:}00{.}856$  of people are looking at SV2A

NOTE Confidence: 0.938423890909091

 $00{:}53{:}00{.}856 \dashrightarrow 00{:}53{:}03{.}286$  with the psyched elics as well.

NOTE Confidence: 0.938423890909091

 $00:53:03.290 \rightarrow 00:53:05.910$  So, so I think yeah,

- NOTE Confidence: 0.938423890909091
- $00:53:05.910 \longrightarrow 00:53:08.346$  I think that that's definitely a
- NOTE Confidence: 0.938423890909091
- $00{:}53{:}08{.}346 \dashrightarrow 00{:}53{:}10{.}698$  nice pairing that we could do with
- NOTE Confidence: 0.938423890909091
- $00:53:10.698 \rightarrow 00:53:12.602$  wonderful studies and just to follow
- NOTE Confidence: 0.938423890909091
- $00:53:12.602 \rightarrow 00:53:16.640$  up on that are people who are taking.
- NOTE Confidence: 0.938423890909091
- $00:53:16.640 \longrightarrow 00:53:20.078$  5 Methoxy DMT that the drug
- NOTE Confidence: 0.938423890909091
- $00:53:20.080 \longrightarrow 00:53:21.280$  do they get very quiet?
- NOTE Confidence: 0.938423890909091
- $00:53:21.280 \rightarrow 00:53:24.024$  I mean do they they have a very
- NOTE Confidence: 0.938423890909091
- $00:53:24.024 \rightarrow 00:53:25.127$  internal psychedelic experience
- NOTE Confidence: 0.938423890909091
- $00{:}53{:}25{.}127 \dashrightarrow 00{:}53{:}27{.}570$  that would parallel the the loss of
- NOTE Confidence: 0.938423890909091
- 00:53:27.570 --> 00:53:30.720 of sub vocalizations of subsonic,
- NOTE Confidence: 0.938423890909091
- $00:53:30.720 \dashrightarrow 00:53:33.418$  ultrasonic Yeah that's that's
- NOTE Confidence: 0.938423890909091
- $00:53:33.418 \longrightarrow 00:53:34.276$  an interesting question.
- NOTE Confidence: 0.938423890909091
- $00:53:34.280 \longrightarrow 00:53:36.947$  I I think that from from what
- NOTE Confidence: 0.938423890909091
- $00{:}53{:}36{.}947 \dashrightarrow 00{:}53{:}38{.}600$  I've read about this,
- NOTE Confidence: 0.938423890909091
- $00:53:38.600 \longrightarrow 00:53:40.700$  it seems that they do have a
- NOTE Confidence: 0.938423890909091

- 00:53:40.700 -> 00:53:41.600 pretty internal experience.
- NOTE Confidence: 0.938423890909091
- 00:53:41.600 00:53:43.210 It's.
- NOTE Confidence: 0.938423890909091
- 00:53:43.210 --> 00:53:43.832 You know,
- NOTE Confidence: 0.938423890909091
- $00:53:43.832 \rightarrow 00:53:46.009$  almost to the point of like ego
- NOTE Confidence: 0.938423890909091
- $00{:}53{:}46.009 \dashrightarrow 00{:}53{:}47.773$  dissolution for some it's it's a
- NOTE Confidence: 0.938423890909091
- $00:53:47.773 \rightarrow 00:53:49.144$  very intense psychedelic experience.
- NOTE Confidence: 0.938423890909091
- $00:53:49.144 \longrightarrow 00:53:51.586$  So I would imagine that they
- NOTE Confidence: 0.938423890909091
- $00:53:51.586 \rightarrow 00:53:53.688$  they probably are not really
- NOTE Confidence: 0.938423890909091
- $00{:}53{:}53{.}688 \dashrightarrow 00{:}53{:}55{.}316$  interacting with their environment
- NOTE Confidence: 0.938423890909091
- $00:53:55.316 \longrightarrow 00:53:56.850$  in a substantial way.
- NOTE Confidence: 0.938423890909091
- 00:53:56.850 --> 00:53:56.970 Yeah,
- NOTE Confidence: 0.93622824
- $00:54:00.250 \longrightarrow 00:54:01.330$  I had a brief question
- NOTE Confidence: 0.939479492307692
- $00:54:05.650 \longrightarrow 00:54:08.261$  I wanted to ask about the plot
- NOTE Confidence: 0.939479492307692
- $00{:}54{:}08{.}261 \dashrightarrow 00{:}54{:}10{.}120$  with the different doses of
- NOTE Confidence: 0.939479492307692
- $00:54:10.120 \rightarrow 00:54:12.590$  five MEODMT and the psilocybin.
- NOTE Confidence: 0.939479492307692
- $00:54:12.590 \longrightarrow 00:54:14.388$  So just looking at that pot,

- NOTE Confidence: 0.939479492307692
- 00:54:14.390 --> 00:54:15.913 I I wouldn't necessarily pull
- NOTE Confidence: 0.939479492307692
- $00:54:15.913 \dashrightarrow 00:54:17.528$  out the differences that people
- NOTE Confidence: 0.939479492307692
- 00:54:17.528 --> 00:54:19.630 talk about with DMT lasting much,
- NOTE Confidence: 0.939479492307692
- $00:54:19.630 \longrightarrow 00:54:22.542$  much shorter than psilocybin
- NOTE Confidence: 0.939479492307692
- $00{:}54{:}22{.}542 \dashrightarrow 00{:}54{:}24{.}490$  because all the curves seem to
- NOTE Confidence: 0.939479492307692
- $00:54:24.490 \longrightarrow 00:54:26.442$  come back to baseline in about
- NOTE Confidence: 0.939479492307692
- $00:54:26.442 \longrightarrow 00:54:28.830$  an hour or a little less.
- NOTE Confidence: 0.939479492307692
- $00:54:28.830 \rightarrow 00:54:32.950$  What do you think are the differences there?
- NOTE Confidence: 0.939479492307692
- 00:54:32.950 --> 00:54:34.668 Like if is it,
- NOTE Confidence: 0.939479492307692
- $00:54:34.668 \rightarrow 00:54:36.024$  is it a dosing difference between
- NOTE Confidence: 0.939479492307692
- $00:54:36.024 \rightarrow 00:54:37.400$  what people usually take and
- NOTE Confidence: 0.939479492307692
- $00:54:37.400 \longrightarrow 00:54:38.910$  what's been giving given to the
- NOTE Confidence: 0.939479492307692
- $00:54:38.910 \longrightarrow 00:54:40.626$  mice or is it something else?
- NOTE Confidence: 0.9301902
- $00{:}54{:}42{.}890 \dashrightarrow 00{:}54{:}46{.}665$  Yeah. So, well I think that the
- NOTE Confidence: 0.9301902
- 00:54:46.665 --> 00:54:48.160 dose is definitely an important
- NOTE Confidence: 0.9301902

- $00:54:48.221 \rightarrow 00:54:49.685$  point to to touch on here.
- NOTE Confidence: 0.9301902
- 00:54:49.690 --> 00:54:51.610 You know I I see,
- NOTE Confidence: 0.9301902
- 00:54:51.610 -> 00:54:52.882 I think the other point you're
- NOTE Confidence: 0.9301902
- $00:54:52.882 \longrightarrow 00:54:54.330$  making is about the duration.
- NOTE Confidence: 0.9301902
- $00{:}54{:}54{.}330 \dashrightarrow 00{:}54{:}56{.}694$  Does the duration with this assay
- NOTE Confidence: 0.9301902
- $00{:}54{:}56{.}694 \dashrightarrow 00{:}54{:}59{.}228$  really fully reflects the duration of
- NOTE Confidence: 0.9301902
- $00{:}54{:}59{.}228 \dashrightarrow 00{:}55{:}01{.}766$  the human psychedelic effect And and I
- NOTE Confidence: 0.9301902
- $00:55:01.766 \rightarrow 00:55:03.530$  think that that that's a fair point.
- NOTE Confidence: 0.9301902
- $00{:}55{:}03.530 \dashrightarrow 00{:}55{:}05.530$  I think it's not a one to one.
- NOTE Confidence: 0.9301902
- 00:55:05.530 00:55:07.455 You know certainly in humans
- NOTE Confidence: 0.9301902
- $00{:}55{:}07{.}455 \dashrightarrow 00{:}55{:}09{.}380$  the the effects of psilocybin
- NOTE Confidence: 0.9301902
- $00{:}55{:}09{.}450 \dashrightarrow 00{:}55{:}11{.}310$  are going lasting for hours.
- NOTE Confidence: 0.9301902
- 00:55:11.310 --> 00:55:12.668 You know in terms of the dosing,
- NOTE Confidence: 0.9301902
- $00:55:12.670 \longrightarrow 00:55:15.226$  I think that's a really relevant
- NOTE Confidence: 0.9301902
- $00{:}55{:}15{.}226 \dashrightarrow 00{:}55{:}17{.}683$  question to address because the the
- NOTE Confidence: 0.9301902
- $00:55:17.683 \rightarrow 00:55:19.638$  clinical studies with five methoxy

 $00{:}55{:}19.638 \dashrightarrow 00{:}55{:}24.282$  DMT that we have used doses of like

NOTE Confidence: 0.9301902

 $00:55:24.282 \rightarrow 00:55:26.674 6/12/18$  milligrams and typically

NOTE Confidence: 0.9301902

00:55:26.674 --> 00:55:28.846 whereas the doses that we're using

NOTE Confidence: 0.9301902

00:55:28.846 --> 00:55:31.546 here like the 20 mig per kig dose

NOTE Confidence: 0.9301902

 $00{:}55{:}31{.}546 \dashrightarrow 00{:}55{:}33{.}182$  would roughly be equivalent to

NOTE Confidence: 0.9301902

 $00{:}55{:}33.182 \dashrightarrow 00{:}55{:}34.946$  like 90 milligrams in a human.

NOTE Confidence: 0.9301902

 $00:55:34.950 \longrightarrow 00:55:37.158$  So this is a really quite a high

NOTE Confidence: 0.9301902

 $00:55:37.158 \longrightarrow 00:55:38.940$  dose if you look at it that way.

NOTE Confidence: 0.9301902

00:55:38.940 --> 00:55:41.156 So I think that is also a

NOTE Confidence: 0.9301902

00:55:41.156 --> 00:55:42.490 pretty important question going

NOTE Confidence: 0.9301902

00:55:42.490 --> 00:55:44.644 forward is can we achieve similar

NOTE Confidence: 0.9301902

 $00{:}55{:}44.644 \dashrightarrow 00{:}55{:}46.738$  effects with doses that are more

NOTE Confidence: 0.9301902

 $00:55:46.738 \rightarrow 00:55:48.373$  relevant to the human studies?

NOTE Confidence: 0.9301902

 $00{:}55{:}48{.}380 \dashrightarrow 00{:}55{:}48{.}580$  Great.

NOTE Confidence: 0.9301902

 $00:55:48.580 \longrightarrow 00:55:48.980$  Thank you.

- $00{:}55{:}48{.}980 \dashrightarrow 00{:}55{:}49{.}180$  Thank
- NOTE Confidence: 0.8736241
- 00:56:07.220 --> 00:56:07.820 you, Sarah.
- NOTE Confidence: 0.91606288
- $00:56:11.900 \longrightarrow 00:56:12.444$  Oh, perfect.
- NOTE Confidence: 0.91606288
- $00:56:12.444 \longrightarrow 00:56:16.264$  Oh, that would be what are we
- NOTE Confidence: 0.91606288
- $00:56:16.264 \rightarrow 00:56:18.620$  looking for here for a video?
- NOTE Confidence: 0.91606288
- 00:56:18.620 --> 00:56:20.900 OK, it's not in the PowerPoint.
- NOTE Confidence: 0.91606288
- $00:56:20.900 \longrightarrow 00:56:22.584$  It's a separate form.
- NOTE Confidence: 0.91606288
- 00:56:22.584 --> 00:56:25.765 I think it is our next speaker.
- NOTE Confidence: 0.91606288
- $00{:}56{:}25{.}765 \dashrightarrow 00{:}56{:}27{.}070$  It's right here.
- NOTE Confidence: 0.91606288
- 00:56:27.070 --> 00:56:28.458 Our next speaker right here, Yep,
- NOTE Confidence: 0.91606288
- 00:56:28.458 --> 00:56:30.306 our next speaker is Jay Lee,
- NOTE Confidence: 0.91606288
- $00{:}56{:}30{.}310 \dashrightarrow 00{:}56{:}33{.}157$  who was the 2nd year resident and
- NOTE Confidence: 0.91606288
- 00:56:33.157 --> 00:56:35.119 he has done some really innovative
- NOTE Confidence: 0.91606288
- 00:56:35.119 --> 00:56:36.974 work in Uganda bringing some
- NOTE Confidence: 0.91606288
- $00:56:36.974 \longrightarrow 00:56:38.984$  work there to help alleviate
- NOTE Confidence: 0.91606288
- $00:56:38.984 \rightarrow 00:56:40.618$  stigma and psychiatric treatment.

- NOTE Confidence: 0.91606288
- $00:56:40.618 \rightarrow 00:56:43.186$  We will be introduced by Dr.

00:56:43.190 --> 00:56:44.070 Robert Rosenpeck.

NOTE Confidence: 0.9452853

 $00{:}56{:}51{.}690 \dashrightarrow 00{:}56{:}54{.}868$  So I should mention for the historical

NOTE Confidence: 0.9452853

 $00:56:54.868 \rightarrow 00:56:57.956$  record that 50 years ago Jeff Lesman,

NOTE Confidence: 0.9452853

 $00{:}56{:}57{.}956 \dashrightarrow 00{:}57{:}00{.}960$  the son of Seymour Lesman and I.

NOTE Confidence: 0.9452853

00:57:00.960 --> 00:57:03.710 Began our careers at Yale,

NOTE Confidence: 0.9452853

 $00{:}57{:}03{.}710 \dashrightarrow 00{:}57{:}05{.}902$  walking down the Carters of the VA

NOTE Confidence: 0.9452853

 $00:57:05.902 \longrightarrow 00:57:08.790$  to do what every resident must do.

NOTE Confidence: 0.9452853

 $00:57:08.790 \longrightarrow 00:57:09.790$  Get fingerprinted.

NOTE Confidence: 0.936899065

00:57:13.110 --> 00:57:15.030 So, Jeff, if you're out there,

NOTE Confidence: 0.936899065

00:57:15.030 - 00:57:16.068 here's the longevity.

NOTE Confidence: 0.9402535316666667

 $00{:}57{:}18{.}550 \dashrightarrow 00{:}57{:}21{.}586$  Jay Lee is a remarkable person.

NOTE Confidence: 0.9402535316666667

 $00{:}57{:}21.590 \dashrightarrow 00{:}57{:}22.198$  The ordinary.

NOTE Confidence: 0.9402535316666667

 $00{:}57{:}22.198 \dashrightarrow 00{:}57{:}25.770$  So we we shift now to global mental health.

NOTE Confidence: 0.9402535316666667

00:57:25.770 --> 00:57:29.698 Jay Lee was born in Korea.

00:57:29.700 --> 00:57:30.980 Came to the United States,

NOTE Confidence: 0.9402535316666667

 $00{:}57{:}30{.}980 \dashrightarrow 00{:}57{:}33{.}393$  was in a military family and traveled,

NOTE Confidence: 0.9402535316666667

 $00:57:33.393 \rightarrow 00:57:36.940$  lived in many places around the country.

NOTE Confidence: 0.940253531666667

 $00:57:36.940 \rightarrow 00:57:41.444$  And what he developed as a kind of a

NOTE Confidence: 0.940253531666667

00:57:41.444 --> 00:57:44.424 modus Vivendi was a way of fitting into

NOTE Confidence: 0.940253531666667

 $00:57:44.424 \rightarrow 00:57:46.580$  places where he shouldn't have fit in.

NOTE Confidence: 0.9402535316666667

 $00:57:46.580 \longrightarrow 00:57:49.700$  And it wasn't enough to do this in

NOTE Confidence: 0.9402535316666667

 $00{:}57{:}49{.}700 \dashrightarrow 00{:}57{:}53{.}260$  the US and in the American South.

NOTE Confidence: 0.9402535316666667

 $00{:}57{:}53.260 \dashrightarrow 00{:}57{:}54.420$  He had to go further.

NOTE Confidence: 0.9402535316666667

 $00:57:54.420 \longrightarrow 00:57:56.256$  And so he worked in China.

NOTE Confidence: 0.940253531666667

 $00{:}57{:}56{.}260 \dashrightarrow 00{:}57{:}57{.}340$  Now he didn't go to China

NOTE Confidence: 0.9335446666666667

 $00{:}57{:}57{.}340 \dashrightarrow 00{:}57{:}58{.}060$  as a tourist.

NOTE Confidence: 0.91141744

 $00:57:58.060 \rightarrow 00:57:59.260$  This is in college.

NOTE Confidence: 0.590716674

 $00{:}57{:}59{.}690 \dashrightarrow 00{:}58{:}01{.}034$  Medical school Over the

NOTE Confidence: 0.590716674

 $00:58:01.034 \rightarrow 00:58:03.210$  years he went and lived

NOTE Confidence: 0.94780115

 $00:58:03.210 \longrightarrow 00:58:04.450$  there and was involved.

- NOTE Confidence: 0.9402536
- 00:58:05.530 --> 00:58:06.568 China was mild,
- NOTE Confidence: 0.933065457142857
- $00:58:06.730 \longrightarrow 00:58:08.890$  so he was looking for a place where
- NOTE Confidence: 0.933065457142857
- $00{:}58{:}08{.}890 \dashrightarrow 00{:}58{:}10{.}648$  he could have a new experience
- NOTE Confidence: 0.9402536
- $00:58:11.370 \longrightarrow 00:58:13.146$  and he chose Africa,
- NOTE Confidence: 0.9402536
- $00:58:13.146 \longrightarrow 00:58:15.366$  spent some time in Ghana,
- NOTE Confidence: 0.9402536
- $00{:}58{:}15{.}370 \dashrightarrow 00{:}58{:}17{.}250$  then ended up in Uganda.
- NOTE Confidence: 0.9402536
- 00:58:17.250 --> 00:58:19.210 He's an incredible networker,
- NOTE Confidence: 0.9402536
- $00:58:19.210 \rightarrow 00:58:23.395$  connected with people and created Empower
- NOTE Confidence: 0.9402536
- $00{:}58{:}23{.}395 \dashrightarrow 00{:}58{:}26{.}930$  Health in a rural area in Uganda,
- NOTE Confidence: 0.9402536
- $00:58:26.930 \longrightarrow 00:58:29.108$  now most researchers.
- NOTE Confidence: 0.9402536
- 00:58:29.108 --> 00:58:31.160 Service researchers find a
- NOTE Confidence: 0.9402536
- $00{:}58{:}31{.}160 \dashrightarrow 00{:}58{:}33{.}380$  health system and study it.
- NOTE Confidence: 0.9402536
- $00:58:33.380 \dashrightarrow 00:58:35.400$  Jay, with his incredible talents,
- NOTE Confidence: 0.9402536
- $00:58:35.400 \longrightarrow 00:58:37.965$  created a health system and
- NOTE Confidence: 0.9402536
- $00:58:37.965 \rightarrow 00:58:40.920$  now is beginning to study it.
- NOTE Confidence: 0.9402536
$00:58:40.920 \longrightarrow 00:58:44.408$  He started a program in which

NOTE Confidence: 0.9402536

 $00:58:44.408 \longrightarrow 00:58:47.060$  thirty students from both

NOTE Confidence: 0.9402536

 $00{:}58{:}47.060 \dashrightarrow 00{:}58{:}50.288$  Ug and a and the US are paying to

NOTE Confidence: 0.9402536

 $00{:}58{:}50{.}288 \dashrightarrow 00{:}58{:}53{.}700$  go spend their time with him.

NOTE Confidence: 0.9402536

 $00{:}58{:}53{.}700 \dashrightarrow 00{:}58{:}56{.}165$  They are doing research and

NOTE Confidence: 0.9402536

 $00:58:56.165 \rightarrow 00:58:57.442$  learning clinical work.

NOTE Confidence: 0.9402536

 $00{:}58{:}57{.}442 \dashrightarrow 00{:}58{:}59{.}397$  Many of these are undergraduates

NOTE Confidence: 0.9402536

 $00:58:59.397 \rightarrow 00:59:00.179$  and graduates.

NOTE Confidence: 0.9402536

00:59:00.180 --> 00:59:00.860 So he's

NOTE Confidence: 0.953671343333333

 $00{:}59{:}00{.}900 \dashrightarrow 00{:}59{:}03{.}420$  a social entrepreneur of incredible

NOTE Confidence: 0.945285193333333

 $00{:}59{:}03{.}420 \dashrightarrow 00{:}59{:}08{.}120$  talent and this is the beginning of what

NOTE Confidence: 0.945285193333333

 $00{:}59{:}08{.}120 \dashrightarrow 00{:}59{:}10{.}562$  will be a research career which will

NOTE Confidence: 0.945285193333333

 $00{:}59{:}10.562 \dashrightarrow 00{:}59{:}12.940$  be layered on top of that. Thank you.

NOTE Confidence: 0.921661518181818

00:59:17.500 --> 00:59:18.427 Greetings from Uganda.

NOTE Confidence: 0.921661518181818

 $00{:}59{:}18{.}427 \dashrightarrow 00{:}59{:}21{.}040$  I apologize that I cannot join in person,

NOTE Confidence: 0.921661518181818

 $00{:}59{:}21{.}040 \dashrightarrow 00{:}59{:}23{.}063$  but it's such an honor to be

 $00:59:23.063 \longrightarrow 00:59:24.360$  recognized for this award.

NOTE Confidence: 0.921661518181818

00:59:24.360 --> 00:59:26.128 My name is Jay, I'm a second year

NOTE Confidence: 0.921661518181818

 $00{:}59{:}26.128 \dashrightarrow 00{:}59{:}27.619$  resident in the program and today

NOTE Confidence: 0.921661518181818

 $00:59:27.619 \longrightarrow 00:59:29.510$  I'm going to be talking about a

NOTE Confidence: 0.921661518181818

 $00{:}59{:}29{.}510 \dashrightarrow 00{:}59{:}31{.}200$  novel intervention that we conducted

NOTE Confidence: 0.921661518181818

 $00{:}59{:}31{.}200 \dashrightarrow 00{:}59{:}33{.}508$  to destigmatize mental illness in a

NOTE Confidence: 0.921661518181818

 $00:59:33.508 \rightarrow 00:59:36.826$  rural area of a low income country.

NOTE Confidence: 0.921661518181818

 $00:59:36.830 \longrightarrow 00:59:39.038$  So I wanted to give you a little

NOTE Confidence: 0.921661518181818

 $00:59:39.038 \longrightarrow 00:59:41.147$  bit of context of this work.

NOTE Confidence: 0.921661518181818

 $00{:}59{:}41{.}150 \dashrightarrow 00{:}59{:}43{.}579$  So I've worked in rural Uganda on

NOTE Confidence: 0.921661518181818

 $00:59:43.579 \rightarrow 00:59:45.550$  various health related interventions,

NOTE Confidence: 0.921661518181818

 $00{:}59{:}45{.}550 \dashrightarrow 00{:}59{:}47{.}902$  specifically the Basuga region in the

NOTE Confidence: 0.921661518181818

 $00{:}59{:}47{.}902 \dashrightarrow 00{:}59{:}52{.}110$  eastern region of Uganda since 2015.

NOTE Confidence: 0.921661518181818

00:59:52.110 --> 00:59:53.950 And in 2018, you know,

NOTE Confidence: 0.921661518181818

00:59:53.950 --> 00:59:55.890 I started A51C3 organization

00:59:55.890 --> 00:59:57.830 called Empowered Through Help.

NOTE Confidence: 0.921661518181818

00:59:57.830 --> 00:59:59.990 And currently, we provide healthcare,

NOTE Confidence: 0.921661518181818

 $00{:}59{:}59{.}990 \dashrightarrow 01{:}00{:}01{.}875$  General Healthcare to a catchment

NOTE Confidence: 0.921661518181818

01:00:01.875 --> 01:00:03.383 area of 70,000 people,

NOTE Confidence: 0.921661518181818

 $01{:}00{:}03.390 \dashrightarrow 01{:}00{:}05.215$  mental healthcare to a catchment

NOTE Confidence: 0.921661518181818

 $01:00:05.215 \longrightarrow 01:00:07.722$  area of 400,000 people and we

NOTE Confidence: 0.921661518181818

 $01:00:07.722 \rightarrow 01:00:09.051$  conduct experiential fellowships

NOTE Confidence: 0.921661518181818

01:00:09.051 --> 01:00:11.321 for pre doctoral Ugandan and

NOTE Confidence: 0.921661518181818

 $01{:}00{:}11{.}321 \dashrightarrow 01{:}00{:}13.069$  American students this summer.

NOTE Confidence: 0.921661518181818

 $01{:}00{:}13.070 \dashrightarrow 01{:}00{:}16.154$  We have approximately 55 students in

NOTE Confidence: 0.921661518181818

 $01:00:16.154 \rightarrow 01:00:18.614$  total and they work collaboratively

NOTE Confidence: 0.921661518181818

 $01:00:18.614 \rightarrow 01:00:21.044$  on global mental health projects.

NOTE Confidence: 0.921661518181818

01:00:21.050 --> 01:00:23.990 And in 2021, we started providing

NOTE Confidence: 0.921661518181818

01:00:23.990 --> 01:00:25.786 mental healthcare you know,

NOTE Confidence: 0.921661518181818

 $01:00:25.786 \rightarrow 01:00:28.642$  to people out of our Health Center

NOTE Confidence: 0.921661518181818

 $01:00:28.650 \rightarrow 01:00:30.449$  and this is a very rural area.

01:00:30.450 --> 01:00:31.890 You know, there was no,

NOTE Confidence: 0.921661518181818

01:00:31.890 --> 01:00:32.676 you know,

NOTE Confidence: 0.921661518181818

 $01:00:32.676 \longrightarrow 01:00:34.641$  evidence based on mental healthcare

NOTE Confidence: 0.921661518181818

 $01:00:34.641 \rightarrow 01:00:36.489$  system available in this area.

NOTE Confidence: 0.921661518181818

 $01:00:36.490 \longrightarrow 01:00:38.938$  So we realized that you know in order

NOTE Confidence: 0.921661518181818

 $01:00:38.938 \rightarrow 01:00:41.248$  to increase mental healthcare seeking,

NOTE Confidence: 0.921661518181818

 $01:00:41.250 \rightarrow 01:00:44.813$  we need to do some educational programs

NOTE Confidence: 0.921661518181818

 $01{:}00{:}44.813 \dashrightarrow 01{:}00{:}47.593$  and some sensitization programs to to

NOTE Confidence: 0.921661518181818

 $01{:}00{:}47.593 \dashrightarrow 01{:}00{:}49.697$  let people know that you know we have.

NOTE Confidence: 0.921661518181818

 $01:00:49.700 \longrightarrow 01:00:51.420$  Medications that that can work,

NOTE Confidence: 0.921661518181818

 $01:00:51.420 \longrightarrow 01:00:54.348$  that can help for things like

NOTE Confidence: 0.921661518181818

 $01:00:54.348 \longrightarrow 01:00:55.812$  psychosis and mania.

NOTE Confidence: 0.921661518181818

 $01{:}00{:}55.820 \dashrightarrow 01{:}00{:}57.076$  So I looked at,

NOTE Confidence: 0.921661518181818

 $01:00:57.076 \longrightarrow 01:00:58.646$  you know what other interventions

NOTE Confidence: 0.921661518181818

 $01{:}00{:}58.646 \dashrightarrow 01{:}01{:}00.543$  have been done to encourage

 $01:01:00.543 \rightarrow 01:01:02.059$  healthcare seeking for mental

NOTE Confidence: 0.921661518181818

 $01{:}01{:}02.059 \dashrightarrow 01{:}01{:}04.099$  illnesses in low income countries.

NOTE Confidence: 0.921661518181818

01:01:04.100 --> 01:01:06.697 And frankly I didn't find very much

NOTE Confidence: 0.921661518181818

 $01{:}01{:}06.700 \dashrightarrow 01{:}01{:}08.828$  but the but the condition that has

NOTE Confidence: 0.921661518181818

 $01{:}01{:}08.828 \dashrightarrow 01{:}01{:}10.778$  had better funding and global health

NOTE Confidence: 0.921661518181818

 $01:01:10.780 \longrightarrow 01:01:13.265$  that's got many parallels in my opinion

NOTE Confidence: 0.921661518181818

01:01:13.265 --> 01:01:15.460 to chronic mental illnesses like

NOTE Confidence: 0.921661518181818

01:01:15.460 --> 01:01:18.220 schizophrenia and bipolar disorder is HIV,

NOTE Confidence: 0.921661518181818

 $01{:}01{:}18.220 \dashrightarrow 01{:}01{:}18.603$  AIDS.

NOTE Confidence: 0.921661518181818

 $01:01:18.603 \rightarrow 01:01:21.284$  They're similar in that they're both chronic,

NOTE Confidence: 0.921661518181818

 $01:01:21.290 \longrightarrow 01:01:22.754$  they're both heavily stigmatized.

NOTE Confidence: 0.921661518181818

 $01{:}01{:}22.754 \dashrightarrow 01{:}01{:}24.950$  So I looked at what interventions

NOTE Confidence: 0.921661518181818

01:01:25.013 - 01:01:26.927 have been conducted before for HIV,

NOTE Confidence: 0.921661518181818

 $01{:}01{:}26.930 \dashrightarrow 01{:}01{:}28.928$  AIDS and there was some really

NOTE Confidence: 0.921661518181818

 $01:01:28.928 \rightarrow 01:01:30.656$  good evidence for creative based

NOTE Confidence: 0.921661518181818

 $01{:}01{:}30.656 \dashrightarrow 01{:}01{:}32.008$  interventions and among these

 $01{:}01{:}32.008 \dashrightarrow 01{:}01{:}34.290$  the other had the most evidence.

NOTE Confidence: 0.921661518181818

 $01:01:34.290 \rightarrow 01:01:36.300$  So we subsequently developed and

NOTE Confidence: 0.921661518181818

 $01{:}01{:}36{.}300 \dashrightarrow 01{:}01{:}37{.}908$  conducted the first evaluation

NOTE Confidence: 0.921661518181818

 $01:01:37.908 \longrightarrow 01:01:39.935$  of a creative based intervention

NOTE Confidence: 0.921661518181818

 $01{:}01{:}39{.}935 \dashrightarrow 01{:}01{:}41{.}885$  to reduce mental illness stigma

NOTE Confidence: 0.921661518181818

 $01:01:41.885 \rightarrow 01:01:44.492$  in a low income country aimed at

NOTE Confidence: 0.921661518181818

 $01:01:44.492 \longrightarrow 01:01:45.569$  the general population.

NOTE Confidence: 0.91994499375

 $01{:}01{:}47.680 \dashrightarrow 01{:}01{:}49.880$  So here are the methods that we utilize.

NOTE Confidence: 0.91994499375

01:01:49.880 --> 01:01:52.072 So the first step was to find the

NOTE Confidence: 0.91994499375

 $01{:}01{:}52.072 \dashrightarrow 01{:}01{:}53.749$  current beliefs and attitudes for

NOTE Confidence: 0.91994499375

 $01:01:53.749 \longrightarrow 01:01:55.879$  severe mental illness in the population

NOTE Confidence: 0.91994499375

 $01{:}01{:}55{.}880 \dashrightarrow 01{:}01{:}58{.}315$  and utilizing that information we

NOTE Confidence: 0.91994499375

 $01{:}01{:}58{.}315 \dashrightarrow 01{:}02{:}00{.}750$  developed the criteria for intervention

NOTE Confidence: 0.91994499375

 $01{:}02{:}00.823 \dashrightarrow 01{:}02{:}02{.}958$  which is the other intervention.

NOTE Confidence: 0.91994499375

 $01{:}02{:}02{.}960 \dashrightarrow 01{:}02{:}05{.}474$  And then we evaluated the effectiveness

 $01:02:05.474 \longrightarrow 01:02:07.543$  of the intervention using a

NOTE Confidence: 0.91994499375

 $01:02:07.543 \rightarrow 01:02:09.475$  single arm pre post study design.

NOTE Confidence: 0.93220288

01:02:11.610 --> 01:02:12.930 So to start off with,

NOTE Confidence: 0.93220288

 $01:02:12.930 \longrightarrow 01:02:15.240$  we conducted 4 focus groups with

NOTE Confidence: 0.93220288

 $01{:}02{:}15{.}240 \dashrightarrow 01{:}02{:}17{.}414$  community members from from the area

NOTE Confidence: 0.93220288

 $01:02:17.414 \rightarrow 01:02:20.018$  that we are that we are working and we NOTE Confidence: 0.93220288

 $01:02:20.018 \rightarrow 01:02:21.538$  utilize this information to develop

NOTE Confidence: 0.93220288

 $01{:}02{:}21{.}538 \dashrightarrow 01{:}02{:}23{.}409$  a criteria for the intervention.

NOTE Confidence: 0.93220288

 $01{:}02{:}23{.}410 \dashrightarrow 01{:}02{:}26{.}040$  So our aim was to not. Change beliefs,

NOTE Confidence: 0.93220288

 $01:02:26.040 \rightarrow 01:02:28.260$  but to work within existing beliefs,

NOTE Confidence: 0.93220288

 $01{:}02{:}28.260 \dashrightarrow 01{:}02{:}30.540$  to add the belief that medications

NOTE Confidence: 0.93220288

01:02:30.540 --> 01:02:33.180 can be helpful for conditions such

NOTE Confidence: 0.93220288

01:02:33.180 --> 01:02:36.940 as like such as psychosis, Amania,

NOTE Confidence: 0.93220288

 $01{:}02{:}36{.}940 \dashrightarrow 01{:}02{:}40{.}480$  and to incorporate those new beliefs

NOTE Confidence: 0.93220288

 $01{:}02{:}40.480 \dashrightarrow 01{:}02{:}43.076$  within the existing belief and

NOTE Confidence: 0.93220288

 $01{:}02{:}43.076 \dashrightarrow 01{:}02{:}44.420$  then the the atrical intervention.

- NOTE Confidence: 0.93220288
- $01:02:44.420 \longrightarrow 01:02:47.528$  So from the focus groups we developed

01:02:47.528 --> 01:02:49.870 the criteria of you know what we want

NOTE Confidence: 0.93220288

 $01{:}02{:}49{.}870 \dashrightarrow 01{:}02{:}51{.}938$  to see in the seen that the others get.

NOTE Confidence: 0.93220288

 $01:02:51.940 \longrightarrow 01:02:54.070$  So outside of that was up

NOTE Confidence: 0.93220288

 $01:02:54.070 \longrightarrow 01:02:55.135$  to the participants,

NOTE Confidence: 0.93220288

 $01:02:55.140 \longrightarrow 01:02:57.625$  up to the audience or up to

NOTE Confidence: 0.93220288

 $01:02:57.625 \rightarrow 01:02:59.818$  the community to come up with,

NOTE Confidence: 0.93220288

01:02:59.820 --> 01:03:00.534 you know,

NOTE Confidence: 0.93220288

 $01{:}03{:}00{.}534 \dashrightarrow 01{:}03{:}03{.}033$  useful the other skits that they found

NOTE Confidence: 0.93220288

 $01{:}03{:}03{.}033 \dashrightarrow 01{:}03{:}05{.}524$  was entertaining and that they found

NOTE Confidence: 0.93220288

 $01:03:05.524 \rightarrow 01:03:08.058$  was that they found was helpful.

NOTE Confidence: 0.93220288

 $01{:}03{:}08{.}060 \dashrightarrow 01{:}03{:}10{.}370$  So we had a competition for

NOTE Confidence: 0.93220288

 $01{:}03{:}10.370 \dashrightarrow 01{:}03{:}12.484$  the best the other skit.

NOTE Confidence: 0.93220288

 $01{:}03{:}12{.}484 \dashrightarrow 01{:}03{:}14{.}724$  So four different teams competed

NOTE Confidence: 0.93220288

 $01{:}03{:}14.724 \dashrightarrow 01{:}03{:}18.232$  and and the winner was a group that

 $01:03:18.232 \rightarrow 01:03:20.645$  portrayed A relatable story of an

NOTE Confidence: 0.93220288

01:03:20.645 --> 01:03:22.233 individual with mental illness.

NOTE Confidence: 0.93220288

 $01:03:22.240 \rightarrow 01:03:24.800$  So if he had what looks like psychosis,

NOTE Confidence: 0.93220288

 $01:03:24.800 \longrightarrow 01:03:27.040$  so at first he took him to

NOTE Confidence: 0.93220288

01:03:27.040 --> 01:03:28.820 traditional healer, He was still sick.

NOTE Confidence: 0.93220288

 $01:03:28.820 \longrightarrow 01:03:30.530$  After that they took him to

NOTE Confidence: 0.93220288

 $01:03:30.599 \rightarrow 01:03:32.399$  religious leader for prayers.

NOTE Confidence: 0.93220288

 $01:03:32.400 \longrightarrow 01:03:33.516$  He was still sick after that.

NOTE Confidence: 0.93220288

 $01{:}03{:}33{.}520 \dashrightarrow 01{:}03{:}35{.}128$  And then he got some medication

NOTE Confidence: 0.93220288

 $01{:}03{:}35{.}128 \dashrightarrow 01{:}03{:}37{.}451$  and then he got better and he got

NOTE Confidence: 0.93220288

 $01{:}03{:}37{.}451 \dashrightarrow 01{:}03{:}39{.}583$  functional enough so that he could hold NOTE Confidence: 0.93220288

 $01:03:39.583 \rightarrow 01:03:41.919$  down the job as a motorcycle taxi driver,

NOTE Confidence: 0.93220288

 $01:03:41.920 \longrightarrow 01:03:43.695$  which is a well regarded profession

NOTE Confidence: 0.93220288

 $01:03:43.695 \longrightarrow 01:03:45.115$  in the village setting.

NOTE Confidence: 0.94780115

 $01:03:47.960 \longrightarrow 01:03:49.660$  And to evaluate the

NOTE Confidence: 0.94780115

 $01{:}03{:}49.660 \dashrightarrow 01{:}03{:}51.360$  effectiveness of this program,

- NOTE Confidence: 0.94780115
- $01:03:51.360 \longrightarrow 01:03:55.165$  we utilize the 61 item questionnaire as
- NOTE Confidence: 0.94780115
- $01{:}03{:}55{.}165 \dashrightarrow 01{:}03{:}58{.}315$  measuring demographics as well as stigma.
- NOTE Confidence: 0.94780115
- $01{:}03{:}58{.}320 \dashrightarrow 01{:}03{:}59{.}875$  So the Sigma questionnaire in
- NOTE Confidence: 0.94780115
- 01:03:59.875 --> 01:04:01.775 particular was taken by from a
- NOTE Confidence: 0.94780115
- $01{:}04{:}01{.}775 \dashrightarrow 01{:}04{:}03{.}479$  study that Doctor Rosenhack and Dr.
- NOTE Confidence: 0.94780115
- 01:04:03.480 --> 01:04:05.140 Iannacho conducted in Nigeria
- NOTE Confidence: 0.94780115
- $01:04:05.140 \longrightarrow 01:04:06.800$  a few years ago.
- NOTE Confidence: 0.94780115
- $01:04:06.800 \longrightarrow 01:04:09.000$  And we also divided that
- NOTE Confidence: 0.94780115
- 01:04:09.000 --> 01:04:10.760 up into two categories,
- NOTE Confidence: 0.94780115
- $01:04:10.760 \longrightarrow 01:04:12.615$  broad acceptance scale and the
- NOTE Confidence: 0.94780115
- 01:04:12.615 --> 01:04:13.728 Personal Acceptance Scale.
- NOTE Confidence: 0.94780115
- $01{:}04{:}13.730 \dashrightarrow 01{:}04{:}15.878$  And so in general,
- NOTE Confidence: 0.94780115
- $01:04:15.878 \longrightarrow 01:04:18.026$  broad acceptance scale reflected
- NOTE Confidence: 0.94780115
- 01:04:18.026 --> 01:04:20.959 structural stigma and personal acceptance
- NOTE Confidence: 0.94780115
- 01:04:20.959 --> 01:04:23.924 scale reflected public public stigma.
- NOTE Confidence: 0.94780115

 $01:04:23.930 \longrightarrow 01:04:25.218$  So this is kind of like the

NOTE Confidence: 0.94780115

 $01:04:25.218 \longrightarrow 01:04:26.490$  flow chart of the evaluation.

NOTE Confidence: 0.94780115

 $01:04:26.490 \longrightarrow 01:04:28.570$  So initially we selected 101

NOTE Confidence: 0.94780115

 $01:04:28.570 \rightarrow 01:04:30.650$  participants randomly to get the

NOTE Confidence: 0.94780115

 $01:04:30.724 \rightarrow 01:04:33.250$  initial questionnaire and of the 100,

NOTE Confidence: 0.94780115

 $01:04:33.250 \longrightarrow 01:04:36.110$  one 77 watch the intervention.

NOTE Confidence: 0.94780115

01:04:36.110 --> 01:04:39.372 And 57 of the 77 were administered

NOTE Confidence: 0.94780115

 $01{:}04{:}39{.}372 \dashrightarrow 01{:}04{:}41{.}842$  A question naire one week later and

NOTE Confidence: 0.94780115

01:04:41.842 --> 01:04:44.660 46 of the 57 were administered A

NOTE Confidence: 0.94780115

 $01{:}04{:}44.660 \dashrightarrow 01{:}04{:}46.850$  questionnaire one year later to

NOTE Confidence: 0.94780115

 $01{:}04{:}46.850 \dashrightarrow 01{:}04{:}49.230$  evaluate the long term effect.

NOTE Confidence: 0.94780115

 $01{:}04{:}49{.}230 \dashrightarrow 01{:}04{:}52{.}983$  So the results, so as you can see here,

NOTE Confidence: 0.94780115

 $01:04:52.990 \longrightarrow 01:04:54.962$  the broad acceptance scale,

NOTE Confidence: 0.94780115

 $01{:}04{:}54{.}962 \dashrightarrow 01{:}04{:}57{.}150$  so people begin accepting those

NOTE Confidence: 0.94780115

 $01{:}04{:}57{.}150 \dashrightarrow 01{:}04{:}58{.}350$  with mental illness.

NOTE Confidence: 0.94780115

 $01:04:58.350 \rightarrow 01:05:00.505$  We're having more accepting beliefs

- NOTE Confidence: 0.94780115
- $01{:}05{:}00.505 \dashrightarrow 01{:}05{:}02.660$  towards those with mental illness

 $01{:}05{:}02.730 \dashrightarrow 01{:}05{:}04.920$  quite significantly as you can see.

NOTE Confidence: 0.94780115

 $01:05:04.920 \longrightarrow 01:05:06.970$  And also for the Personal

NOTE Confidence: 0.94780115

 $01:05:06.970 \rightarrow 01:05:08.200$  Acceptance Scale too.

NOTE Confidence: 0.94780115

 $01{:}05{:}08{.}200 \dashrightarrow 01{:}05{:}10{.}558$  And these are some effect sizes.

NOTE Confidence: 0.94780115

01:05:10.560 --> 01:05:11.704 As you can see,

NOTE Confidence: 0.94780115

01:05:11.704 --> 01:05:13.420 the coins D reflects almost like

NOTE Confidence: 0.94780115

 $01:05:13.489 \longrightarrow 01:05:15.379$  a difference in one standard

NOTE Confidence: 0.94780115

 $01:05:15.379 \longrightarrow 01:05:17.200$  deviation for both broad and

NOTE Confidence: 0.94780115

01:05:17.200 --> 01:05:18.280 Personal Acceptance Scale.

NOTE Confidence: 0.94780115

 $01{:}05{:}18.280 \dashrightarrow 01{:}05{:}21.480$  And it also shows that that change

NOTE Confidence: 0.94780115

 $01{:}05{:}21{.}480 \dashrightarrow 01{:}05{:}23{.}440$  has persisted not over like one week,

NOTE Confidence: 0.94780115

 $01:05:23.440 \longrightarrow 01:05:26.158$  but over the course of one year as well.

NOTE Confidence: 0.938386512

 $01{:}05{:}29{.}690 \dashrightarrow 01{:}05{:}31{.}370$  So some significant findings of this

NOTE Confidence: 0.938386512

 $01{:}05{:}31{.}370 \dashrightarrow 01{:}05{:}33{.}492$  study is that this was the first

 $01:05:33.492 \rightarrow 01:05:34.756$  study that evaluated effectiveness

NOTE Confidence: 0.938386512

 $01{:}05{:}34.756 \dashrightarrow 01{:}05{:}36.437$  of a creative based intervention

NOTE Confidence: 0.938386512

01:05:36.437 --> 01:05:38.142 for reducing mental illness stigma

NOTE Confidence: 0.938386512

 $01{:}05{:}38{.}142 \dashrightarrow 01{:}05{:}42{.}569$  in low income countries and it was

NOTE Confidence: 0.938386512

 $01{:}05{:}42.569 \dashrightarrow 01{:}05{:}45.434$  very notable the persistent and

NOTE Confidence: 0.938386512

 $01{:}05{:}45{.}434 \dashrightarrow 01{:}05{:}47{.}810$  significant and large effect sizes

NOTE Confidence: 0.938386512

 $01{:}05{:}47.810$  -->  $01{:}05{:}50.060$  throughout the personal and broad

NOTE Confidence: 0.938386512

 $01{:}05{:}50{.}060 \dashrightarrow 01{:}05{:}52{.}327$  acceptance scale at both time points.

NOTE Confidence: 0.938386512

01:05:52.330 --> 01:05:54.395 And you know, it's notable that this

NOTE Confidence: 0.938386512

01:05:54.395 --> 01:05:56.536 was much greater than most comfortable NOTE Confidence: 0.938386512

 $01{:}05{:}56{.}536$  -->  $01{:}05{:}58{.}421$  interventions that have been conducted NOTE Confidence: 0.938386512

 $01{:}05{:}58{.}421 \dashrightarrow 01{:}06{:}00{.}167$  in high income countries that showed

NOTE Confidence: 0.938386512

 $01{:}06{:}00.167 \dashrightarrow 01{:}06{:}02.090$  more of a modest effect size.

NOTE Confidence: 0.938386512

 $01:06:02.090 \rightarrow 01:06:03.600$  And a possible explanation could

NOTE Confidence: 0.938386512

 $01{:}06{:}03.600 \dashrightarrow 01{:}06{:}05.500$  be that in high income countries

NOTE Confidence: 0.938386512

 $01:06:05.500 \rightarrow 01:06:07.810$  there's just so much media to consume,

 $01:06:07.810 \longrightarrow 01:06:09.770$  whereas in the area that we work,

NOTE Confidence: 0.938386512

01:06:09.770 --> 01:06:12.521 there's one TV for the village that's

NOTE Confidence: 0.938386512

01:06:12.521 --> 01:06:15.445 a communal TV that people utilize to

NOTE Confidence: 0.938386512

 $01{:}06{:}15.445 \dashrightarrow 01{:}06{:}18.410$  watch Uganda play soccer or you know, NOTE Confidence: 0.938386512

 $01:06:18.410 \rightarrow 01:06:21.830$  have seen major presidential addresses.

NOTE Confidence: 0.938386512

 $01{:}06{:}21.830 \dashrightarrow 01{:}06{:}24.894$  But there's not a lot of media that's

NOTE Confidence: 0.938386512

 $01{:}06{:}24.894 \dashrightarrow 01{:}06{:}26.821$  available which could help explain

NOTE Confidence: 0.938386512

 $01:06:26.821 \rightarrow 01:06:29.790$  the a very large effect size as well.

NOTE Confidence: 0.938386512

 $01{:}06{:}29{.}790 \dashrightarrow 01{:}06{:}31{.}782$  The strength of the study was

NOTE Confidence: 0.938386512

 $01:06:31.782 \rightarrow 01:06:33.110$  this community based approach.

NOTE Confidence: 0.938386512

01:06:33.110 --> 01:06:34.163 So you know,

NOTE Confidence: 0.938386512

 $01{:}06{:}34{.}163 \dashrightarrow 01{:}06{:}36{.}269$  we didn't design the intervention ourselves.

NOTE Confidence: 0.938386512

 $01{:}06{:}36{.}270 \dashrightarrow 01{:}06{:}38{.}630$  We just gave a criteria of what the

NOTE Confidence: 0.938386512

 $01{:}06{:}38.630 \dashrightarrow 01{:}06{:}40.333$  intervention should include and it was

NOTE Confidence: 0.938386512

 $01{:}06{:}40{.}333 \dashrightarrow 01{:}06{:}42{.}315$  up to the community to develop something

 $01{:}06{:}42.315 \dashrightarrow 01{:}06{:}44.385$  that was relatable to the audience.

NOTE Confidence: 0.938386512

 $01{:}06{:}44{.}390 \dashrightarrow 01{:}06{:}46{.}630$  And so you know that was certainly a

NOTE Confidence: 0.938386512

 $01:06:46.630 \longrightarrow 01:06:48.904$  strength and could have like also contributed

NOTE Confidence: 0.938386512

 $01:06:48.904 \rightarrow 01:06:51.079$  to the strong effect size as well.

NOTE Confidence: 0.938386512

 $01{:}06{:}51{.}080 \dashrightarrow 01{:}06{:}52{.}844$  And a weakness of the study was

NOTE Confidence: 0.938386512

 $01:06:52.844 \longrightarrow 01:06:54.559$  that there is no control group

NOTE Confidence: 0.938386512

 $01:06:54.560 \rightarrow 01:06:55.800$  just by the study design.

NOTE Confidence: 0.938386512

 $01:06:55.800 \rightarrow 01:06:59.392$  This is a single arm pre post design,

NOTE Confidence: 0.938386512

 $01{:}06{:}59{.}392 \dashrightarrow 01{:}07{:}02{.}152$  so social desirability bias could

NOTE Confidence: 0.938386512

 $01:07:02.152 \longrightarrow 01:07:05.364$  certainly factor in to factor in

NOTE Confidence: 0.938386512

 $01:07:05.364 \rightarrow 01:07:07.874$  to biasing the results here.

NOTE Confidence: 0.938386512

 $01{:}07{:}07{.}880 \dashrightarrow 01{:}07{:}09{.}435$  And another possibility is that

NOTE Confidence: 0.938386512

 $01{:}07{:}09{.}435 \dashrightarrow 01{:}07{:}10{.}679$  attrition could be nonrandom,

NOTE Confidence: 0.938386512

 $01{:}07{:}10.680 \dashrightarrow 01{:}07{:}12.755$  although there is no statistically

NOTE Confidence: 0.938386512

 $01:07:12.755 \rightarrow 01:07:14.415$  significant differences in demographics

NOTE Confidence: 0.938386512

01:07:14.415 --> 01:07:16.505 as well as initial stigma level

- NOTE Confidence: 0.938386512
- $01{:}07{:}16.505 \dashrightarrow 01{:}07{:}17.474$  between the groups.
- NOTE Confidence: 0.94629164
- $01:07:19.520 \longrightarrow 01:07:21.360$  And here are some references
- NOTE Confidence: 0.94629164
- $01:07:21.360 \longrightarrow 01:07:24.560$  and acknowledgments.
- NOTE Confidence: 0.94629164
- $01{:}07{:}24.560 \dashrightarrow 01{:}07{:}26.408$  Appreciation goes out to the entire
- NOTE Confidence: 0.94629164
- 01:07:26.408 --> 01:07:27.640 Empowered Through Health team,
- NOTE Confidence: 0.94629164
- $01{:}07{:}27.640 \dashrightarrow 01{:}07{:}29.090$  as well as from the
- NOTE Confidence: 0.94629164
- 01:07:29.090 --> 01:07:29.960 community Health workers,
- NOTE Confidence: 0.94629164
- 01:07:29.960 --> 01:07:32.880 my many mentors and friends.
- NOTE Confidence: 0.94629164
- 01:07:32.880 --> 01:07:33.318 Thank you. So
- NOTE Confidence: 0.935940714285714
- $01:07:42.070 \longrightarrow 01:07:44.268$  Jay is in Uganda at this moment.
- NOTE Confidence: 0.935940714285714
- 01:07:44.270 --> 01:07:45.705 I think he might be on Zoom,
- NOTE Confidence: 0.935940714285714
- $01:07:45.710 \longrightarrow 01:07:47.390$  though. Are you on Zoom?
- NOTE Confidence: 0.935940714285714
- 01:07:47.390 --> 01:07:50.814 Jay? I'm here. You're here.
- NOTE Confidence: 0.935940714285714
- 01:07:50.814 --> 01:07:52.979 Oh, wonderful. Okay wonderful.
- NOTE Confidence: 0.94528525
- $01:07:58.500 \rightarrow 01:08:00.260$  Any questions for Jay?
- NOTE Confidence: 0.941259873

- $01:08:08.100 \longrightarrow 01:08:09.708$  I'm just curious of what a
- NOTE Confidence: 0.941259873
- 01:08:09.708 --> 01:08:10.780 placebo would look like.
- NOTE Confidence: 0.941259873
- $01:08:10.780 \longrightarrow 01:08:13.271$  Would it just be a presentation
- NOTE Confidence: 0.941259873
- $01:08:13.271 \rightarrow 01:08:16.697$  that was not on the topic?
- NOTE Confidence: 0.941259873
- 01:08:16.700 --> 01:08:18.338 How, how would that be designed?
- NOTE Confidence: 0.93220288
- $01:08:20.090 \longrightarrow 01:08:22.370$  Yeah. So first of all,
- NOTE Confidence: 0.93220288
- 01:08:22.370 --> 01:08:24.064 I think like the first part of
- NOTE Confidence: 0.93220288
- $01:08:24.064 \rightarrow 01:08:25.210$  my presentation where I think,
- NOTE Confidence: 0.93220288
- $01:08:25.210 \rightarrow 01:08:26.410$  you know, like the Lustman Committee
- NOTE Confidence: 0.93220288
- $01:08:26.410 \longrightarrow 01:08:29.455$  and Lustman family as well as,
- NOTE Confidence: 0.93220288
- 01:08:29.455 --> 01:08:31.330 as well as even acknowledging
- NOTE Confidence: 0.93220288
- $01:08:31.330 \longrightarrow 01:08:33.090$  the honor I was cut out.
- NOTE Confidence: 0.93220288
- $01:08:33.090 \longrightarrow 01:08:34.592$  So I'd like to do that.
- NOTE Confidence: 0.93220288
- $01{:}08{:}34{.}592 \dashrightarrow 01{:}08{:}35{.}929$  And I'd also like to thank Doctor
- NOTE Confidence: 0.93220288
- $01:08:35.930 \rightarrow 01:08:36.848$  Rose and that for his very
- NOTE Confidence: 0.93220288
- $01:08:36.850 \longrightarrow 01:08:38.738$  generous introduction as well.

01:08:38.738 --> 01:08:42.150 So we're doing a follow up study.

NOTE Confidence: 0.93220288

01:08:42.150 --> 01:08:44.990 This is going to be like a cluster

NOTE Confidence: 0.93220288

 $01{:}08{:}44{.}990 \dashrightarrow 01{:}08{:}47{.}319$  randomized control trial of a radio

NOTE Confidence: 0.93220288

01:08:47.319 --> 01:08:48.990 intervention to measure you know

NOTE Confidence: 0.93220288

 $01{:}08{:}48{.}990 \dashrightarrow 01{:}08{:}50{.}270$  the difference between stickman.

NOTE Confidence: 0.93220288

 $01{:}08{:}50{.}270 \dashrightarrow 01{:}08{:}52{.}685$  What we're doing there is a control

NOTE Confidence: 0.93220288

 $01{:}08{:}52.685 \dashrightarrow 01{:}08{:}54.905$  group is list ening to programs that

NOTE Confidence: 0.93220288

01:08:54.905 --> 01:08:57.206 are not related to mental illness,

NOTE Confidence: 0.93220288

01:08:57.206 --> 01:08:59.498 but they're they're they're you know,

NOTE Confidence: 0.93220288

 $01{:}08{:}59{.}498 \dashrightarrow 01{:}09{:}02{.}203$  listening to some random programs and

NOTE Confidence: 0.93220288

 $01{:}09{:}02.203 \dashrightarrow 01{:}09{:}05.086$  you know we're serving pre and post.

NOTE Confidence: 0.93220288

01:09:05.086 $\operatorname{-->}$ 01:09:08.744 And the idea is that the idea is

NOTE Confidence: 0.93220288

 $01:09:08.744 \dashrightarrow 01:09:10.263$  that that could be a control group.

NOTE Confidence: 0.798143828571429

01:09:22.350 --> 01:09:24.462 So I see a question on the chat

NOTE Confidence: 0.798143828571429

 $01{:}09{:}24.462 \dashrightarrow 01{:}09{:}26.409$  about major depress of this order.

 $01:09:26.410 \longrightarrow 01:09:28.696$  In the community that we work

NOTE Confidence: 0.798143828571429

01:09:28.696 --> 01:09:30.490 major depressive disorder is not

NOTE Confidence: 0.798143828571429

 $01:09:30.490 \rightarrow 01:09:33.450$  really regarded as mental illness.

NOTE Confidence: 0.798143828571429

 $01:09:33.450 \rightarrow 01:09:35.410$  You know generally when people think

NOTE Confidence: 0.798143828571429

 $01:09:35.410 \longrightarrow 01:09:37.222$  of mental illness or you know they

NOTE Confidence: 0.798143828571429

 $01{:}09{:}37{.}222 \dashrightarrow 01{:}09{:}39{.}559$  call it disease disease of the skull.

NOTE Confidence: 0.798143828571429

01:09:39.559 --> 01:09:41.680 Do you think of four things once

NOTE Confidence: 0.798143828571429

01:09:41.749 --> 01:09:43.930 bipolar disorder, schizophrenia,

NOTE Confidence: 0.798143828571429

 $01{:}09{:}43{.}930 \dashrightarrow 01{:}09{:}47{.}130$  very severe alcohol use disorder

NOTE Confidence: 0.798143828571429

 $01:09:47.130 \longrightarrow 01:09:48.410$  and epilepsy.

NOTE Confidence: 0.798143828571429

 $01:09:48.410 \longrightarrow 01:09:49.930$  So those four are considered

NOTE Confidence: 0.798143828571429

 $01:09:49.930 \longrightarrow 01:09:51.450$  to be like mental illnesses.

NOTE Confidence: 0.798143828571429

 $01{:}09{:}51{.}450 \dashrightarrow 01{:}09{:}53{.}862$  So you know that that could be like the

NOTE Confidence: 0.798143828571429

 $01:09:53.862 \rightarrow 01:09:56.407$  topic for a future studies but you know at.

NOTE Confidence: 0.798143828571429

 $01{:}09{:}56{.}410 \dashrightarrow 01{:}09{:}57{.}898$  1st we need to know more about like

NOTE Confidence: 0.798143828571429

 $01:09:57.898 \rightarrow 01:09:59.227$  the local conceptions of depression

 $01{:}09{:}59{.}227 \dashrightarrow 01{:}10{:}01{.}650$  and how to and how to address that.

NOTE Confidence: 0.798143828571429

01:10:01.650 --> 01:10:02.661 And we're doing,

NOTE Confidence: 0.798143828571429

 $01:10:02.661 \rightarrow 01:10:04.683$  we're partly doing that this summer,

NOTE Confidence: 0.798143828571429

01:10:04.690 --> 01:10:05.060 You know,

NOTE Confidence: 0.798143828571429

01:10:05.060 --> 01:10:06.170 like we're not doing an intervention,

NOTE Confidence: 0.798143828571429

01:10:06.170 --> 01:10:07.190 but we're, you know,

NOTE Confidence: 0.798143828571429

01:10:07.190 --> 01:10:09.310 studying it more in terms of like

NOTE Confidence: 0.798143828571429

 $01:10:09.310 \longrightarrow 01:10:10.685$  the local attitudes and beliefs.